From:	Adrienne Leverette
To:	Exhibits HAGLU
Subject:	House Bill 3058
Date:	Tuesday, March 26, 2019 2:28:28 PM

To the House Committee on Agriculture and Land Use:

I am an Oregonian, and a mother, and I strongly urge you to pass House Bill 3058.

We can no longer wait to take bold action to protect farm workers, children, the safety of our food and the environment. Chlorpyrifos is very harmful to farmworkers and is linked to developmental disabilities in children. These are highly toxic nerve agent pesticides that can damage the developing brains of babies and children, leading to lower birth weight, reduced IQ, loss of memory, and delayed motor development. Let's follow Hawaii's lead, and enact a statewide ban on chlorpyrifos.

We must further ban neonicotinoids, which may be associated with congenital heart defects, neural tube defects, and autism spectrum disorder as well as being capable of disrupting normal hormone function in humans. Equally awful, neonicotinoids indiscriminately kill all insects and aquatic invertebrates. We cannot risk ecological collapse by destroying beneficial insects that support ecosystems.

Sincerely,
Adrienne Leverette

March 22, 2019

Comments in Support of House Bill 3058

Aimee Code, Pesticide Program Director
The Xerces Society for Invertebrate Conservation

The Xerces Society for Invertebrate Conservation (Xerces Society) is pleased to support House Bill 3058. As an organization that works directly with conventional farmers, we are well versed in the importance of balancing pest management strategies and environmental protections.

HB 3058 strikes that balance by protecting pollinators and other beneficial insects from a subset of concerning insecticides without unduly limiting pest management options for professionals. More specifically, HB 3058 ensures that trained professionals oversee use of long-lived and toxic neonicotinoids. The bill also follows the recommendations of U.S. Environmental Protection Agency (EPA) scientists by removing chlorpyrifos from use.

Healthy and Diverse Insect Populations are Essential to Oregon's Agricultural Sector

Along with managed European honey bees, Oregon is home to an estimated 600 species of native bees. Honey bees and native bees jointly provide Oregon agriculture with an estimated $600 million in pollination services annually. The value of honey bees is well documented and research has begun to document the importance of native bees. For example, researchers found that wild bees trip over 80% of alfalfa flowers visited; while the managed leafcutter and honey bees trip only 25% (Brunet and Stewart 2010).

Pollinators are in Decline

A recent global analysis found that 40% of pollinator species may be at risk of extinction in the coming years (IPBES 2016). The drivers of pollinator decline, as identified by years of research, include habitat loss, disease, climate change and pesticide use. While little is known about the health of the hundreds of solitary bee species found in Oregon, many of the native bumble bee species found here are imperiled including *Bombus fervidus, Bombus caliginosus, Bombus suckleyi, Bombus morrisoni, Bombus occidentalis and Bombus franklini.* Managed honey bees also suffer significant losses each year. Jointly, these pollinator declines create challenges for the many crops that depend upon insect pollination.

Neonicotinoids Pose Risks to Pollinators and other Beneficial Insects

Neonicotinoids are the most widely used group of insecticides in the world—and have been for over a decade. The impact of this class of insecticides on pollinating insects such as honey bees and native bees is a cause for concern. Because they are systemic chemicals absorbed into the plant, neonicotinoids can be present in pollen and nectar, making the plants toxic to pollinators that feed on them. The long-lasting presence of neonicotinoids in plants, although useful from a pest management standpoint, makes it possible for these chemicals to harm pollinators even when the initial application is made outside of the bloom period. In addition, depending on the compound, rate, and method of application, neonicotinoids can persist in soil and in plants for very long periods of time. (For extensive reviews of research into neonicotinoids see: Blacquière et al 2012, Wood and Goulson 2017, and Simon-Delso et al, 2015).

HB 3058 does not remove these insecticides from the market, it simply ensures that licensed applicators oversee their use. That means farmers and other industries that rely on insecticides will still have these chemicals available, as long as key staff are licensed. Backyard gardeners will have to use available alternative products or practices. Major home pesticide manufacturers, such as Scotts, are already removing neonicotinoids from their products.

HB 3058 is complemented by the state's pollinator protection efforts as licensed applicators that use neonicotinoids should receive training to avoid causing harm. "*Oregon Department of Agriculture (ODA) awards core pesticide recertification credits for training on how to safely apply pesticides around pollinating bees. These credits are necessary for pesticide applicators seeking to maintain several types of pesticide applicator licenses. People seeking to obtain certain types of pesticide applicator licenses are additionally required to study pollinator protection information and are tested on their comprehension.*" (Oregon Bee Project p 11).

<u>The Risks of Chlorpyrifos Warrant its Removal from the Market</u>

Guided by the findings of federal agencies, Oregon should ban the use of chlorpyrifos. The U.S. Environmental Protection Agency (EPA) was poised to ban all food uses of chlorpyrifos, but before the ban was imposed Administrator Pruitt cancelled the proposal. His action came despite years of research showing how low levels of the chemical affect childhood brain development. A 2016 assessment by EPA found no known safe level for human exposure. Fish and wildlife are also at risk from the use of this insecticide. A Biological Evaluation completed by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, in conjunction with EPA, found that chlorpyrifos is likely to adversely affect 97% of all species listed under the Endangered Species Act.

HB 3058 follows the guidance from federal scientists and bans chlorpyrifos, a chemical with years of research demonstrating severe and irreversible harm to human health and the environment.

For these reasons, the Xerces Society supports HB 3058.

Thank you.

<u>Background on the Xerces Society</u>

The Xerces Society is an international nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat. We are based in Oregon and have offices throughout the United States. The Xerces Society is a global leader in pollinator conservation. With more than 30 staff working on pollinator conservation issues, Xerces has the largest pollinator conservation team worldwide. The Society's work is based on the latest science and is increasingly recognized as the standard for pollinator conservation by organizations such as the United Nations Food and Agriculture Organization, the U.S. Department of Agriculture's Natural Resources Conservation Service, the organic and natural foods industry, and farmers and farm organizations across the United States and abroad.

References

Blacquière, T., Smagghe, G., van Gestel, C. A. M., & Mommaerts. 2012. Neonicotinoids in bees: a review on concentrations, side-effects and risk assessment. *Ecotoxicology* , *21*(4), 973–992.

Brunet, J., C.M. Stewart. 2010. Impact of Bee Species and Plant Density on Alfalfa Pollination and Potential for Gene Flow. *Psyche*, vol. 2010, Article ID 201858. doi:10.1155/2010/201858.

EPA. 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. Available at: https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454 (accessed March 21, 2019).

EPA. 2016. Biological Evaluation Chapters for Chlorpyrifos. Available at: https://www.epa.gov/endangered-species/biological-evaluation-chapters-chlorpyrifos-esa-assessment (accessed March 22, 2019).

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). 2016. The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production. S. G. Potts, V. L. Imperatriz-Fonseca, and H. T. Ngo, eds. *Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, Bonn, Germany. 552 pages.

The Oregon Bee Project Strategic Plan. 2018. Available at: https://www.oregon.gov/ODA/programs/Pesticides/Documents/OregonBeeProjectStrategicPlan.pdf (accessed March 22, 2019).

Simon-Delso, N., Amaral-Rogers, V., Belzunces, L. P., Bonmatin, J. M., Chagnon, M., Downs, C., Wiemers, M. 2015. Systemic insecticides (neonicotinoids and fipronil): trends, uses, mode of action and metabolites. *Environmental Science and Pollution Research International*, *22*(1), 5–34.

Wood, T. J., & Goulson, D. 2017. The environmental risks of neonicotinoid pesticides: a review of the evidence post 2013. *Environmental Science and Pollution Research International*, *24*(21), 17285–17325.

March 26, 2019

The Honorable Brian Clem, Chair
House Agriculture and Land Use Committee
900 Court Street
NE Salem, OR 97301

RE: House Bill 3058 - OPPOSE

Dear Chair Clem:

On behalf of the Household & Commercial Products Association, I respectfully oppose House Bill 3058, which would restrict use of neonicotinoid pesticides.

The Household & Commercial Products Association (HCPA) is the premier trade association representing the interests of companies engaged in the manufacture, formulation, distribution and sale of more than $180 billion annually in the U.S. of familiar consumer products that help household and institutional customers create cleaner and healthier environments. HCPA member companies employ hundreds of thousands of people globally. Products HCPA represents include disinfectants that kill germs in homes, hospitals and restaurants; air fresheners, room deodorizers, and candles that eliminate odors; pest management products for home, lawn and garden, and pets; cleaning products and polishes for use throughout the home and institutions; products used to protect and improve the performance and appearance of automobiles; aerosol products and a host of other products used every day.

Consumer pest products allow Oregon residents in all communities the ability to clean and protect their homes with safe and affordable products against a variety of public health pests. Without access to such products, consumers must choose between taking no action against these pests or paying someone to perform the services for them which can be cost-prohibitive.

Neonicotinoids are a class of neuro-active insecticides chemically related to nicotine. Neonicotinoids used in both indoor and outdoor pest control products to manage insects including bed bugs, stink bugs, cockroaches, grubs, and invasive species like Emerald Ash Borer. The neonicotinoids were developed in large part because they show reduced toxicity compared to previously used organophosphate and carbamate insecticides. Most neonicotinoids show much lower toxicity in mammals than insects. Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the U.S. Environmental Protection Agency (EPA) reviews all current pesticide registrations to ensure they continue to meet the protective FIFRA risk standard in light of new information and evolving science. US EPA is currently in the process of reviewing the safety of neonicotinoids in response to Pollinator Task Force Action Plan and the planned completion in 2019[1].

In addition, the U.S. Department of Agriculture and the US EPA recently released a comprehensive scientific report on honey bee health. The report states that there are multiple factors playing a role in honey bee colony declines, including parasites and disease, genetics, poor nutrition and pesticide exposure. One of the key

[1] https://www.epa.gov/pollinator-protection/schedule-review-neonicotinoid-pesticides

findings of the report is that the parasitic *Varroa* mite is recognized as the major factor underlying colony loss in the U.S. and other countries.

When used properly, pesticides protect plants and home from public health pests. The safety of consumers is the highest priority for HCPA members. HCPA member companies manufacture products that are safe when used according to the directions on the label. Manufacturers are continuously focusing on the safety of products and packaging, as well as helping to prevent their products from reaching children. Users are encouraged to determine the most appropriate product for the need and to read and follow all label directions.

We support continued research on the risks to bee health and readily acknowledge the critical importance of pollinators to the agricultural economy, however, in recognition of the review underway at US EPA and lacking adequate science to support the measure, HCPA respectfully asks for your no vote on the bill.

Sincerely,

Allyson Azar

Allyson Azar
Manager, State Government Relations

OREGON WHEAT GROWERS LEAGUE

115 SE 8th Street | Pendleton, OR 97801 | 541.276.7330 | www.owgl.org

Oregon Wheat Growers use of Neonicotinoids

For Oregon's wheat growers, having access to safe, affordable and effective crop protection tools is vital to producing a viable crop when confronted with harmful pests, diseases, and weeds.

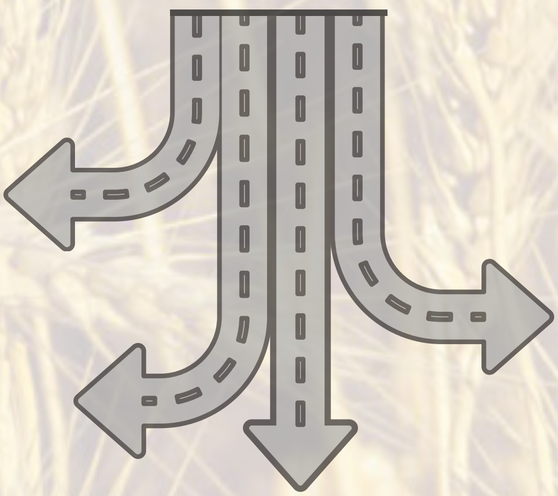
Wheat growers use neonicotinoid seed treatments for spring and winter wheat to guard against insect damage, like wireworm, and soil borne disease to help establish *better, healthier root systems and stronger plant stands.*

NEONICOTINOID SEED TREATMENT IS THE MOST EFFECTIVE AND APPROPRIATE TOOL TO ADDRESS THE NEEDS OF THE WHEAT CROP.

Seed treatments offer wheat growers an economical and efficient means for protecting their wheat seed from damage from early-season seed-borne and soil-borne insects, pests, pathogens and diseases:

The cost increase of wheat production if neonicotinoids were not available would include an increase in pesticide applications and higher seeding rates.

Using seed treatments reduces the need for more expensive chemical applications (if available) to rescue a damaged crop and/or replanting a failed wheat crop if the pest outbreak was not controlled.



Wheat seed is particularly susceptible to numerous types of smut, a fungal disease that infects cereal grain, resulting in loss of yield and quality. Seed treatments have proven to be effective in controlling smut, allowing growers to maximize yield and produce higher quality grain.

For some destructive insects such as wireworms, there are no alternative products for wheat growers. Neonicotinoid seed treatments are the only labeled product for wireworm control in wheat. Wireworm is an insect pest common to the Pacific Northwest growing region, and periodically present in other wheat growing regions.

OWGL HOPES YOU WILL SUPPORT THE CONTINUED USE OF NEONICOTINOIDS BY WHEAT GROWERS IN FULL COMPLIANCE WITH LABEL GUIDELINES THAT ARE REALISTIC AND SENSIBLE, WHICH PROTECT THE ENVIRONMENT IN WHICH THEIR USE OCCURS.

LEAGUE OF WOMEN VOTERS® OF OREGON

The League of Women Voters of Oregon is a 99-year-old grassroots nonpartisan political organization that encourages informed and active participation in government. We envision informed Oregonians participating in a fully accessible, responsive, and transparent government to achieve the common good. LWVOR Legislative Action is based on advocacy positions formed through studies and member consensus. The League never supports or opposes any candidate or political party.

March 25, 2019

To: House Committee on Agriculture and Land Use
Representative Brian Clem, Chair

Re: **HB 3058** – Relating to pesticides, prohibits chlorpyrifos – **Support**

The League of Women Voters of Oregon positions affirm that natural resources should be managed as interrelated parts of life-supporting ecosystems, and that pollution of these resources should be controlled in order to preserve the physical, chemical and biological integrity of ecosystems and to protect public health, and that agriculture policies should promote farm practices that are environmentally sound.

HB 3058 bans the purchase, sale, and use of chlorpyrifos and list neonicotinoids as restricted use pesticides. Chlorpyrifos and neonicotinoids are hazardous pesticides with severe unintentional human and environmental health impacts.

Chlorpyrifos is a toxic nerve agent pesticide that can impact neural development in children, babies, and fetuses (Rotenburg 2003, Qiao 2003). They can persist in the environment, where they are very toxic to many bird species, fish, aquatic invertebrates, and key pollinators such as bees (NPIC 2010).

Neonicotinoids are highly persistent in the environment and highly toxic to insects, including beneficial pollinators like bees, and must be restricted due to their contribution to the current massive loss of biodiversity (Goulson 2018). This legislation allows for continued use, but only after completing training in their use. Home use of neonicotinoids is often higher than agricultural use (Nicholls 2018), and as explained below, untrained use comes with a higher risk of improper application, storage, and disposal. Neonicotinoids are known to contaminate waterways in Oregon (Hladik 2016).

Pesticides are frequently misused, and this results in increased risk of these human and environmental health impacts. Even supporters of continuing use of these hazardous pesticides admit that misuse can pose significant risk, and that proper use merely reduces risk, not eliminates it. While labels are designed to communicate proper use and the risks of misuse, research shows that they are ineffective and confuse users (Dugger-Webster 2018). Non-technical users fail to understand proper application, storage, and disposal, highlighting the importance of ensuring that neonicotinoids are restricted to trained individuals. In particular, users do not understand proper use of personal protective equipment (PPE), posing a greater risk for farmworkers, highlighting the failure of labels even for trained workers. A 2000 study by LWVOR found that farmworker exposure to pesticides is an ongoing concern in Oregon.

Home storage of pesticides like neonicotinoids poses an additional threat to resilience. During disasters such as floods or fires, the soup of hazardous chemicals stored in our home garages and sheds are released into the local environment. Limiting home use improves our ability to survive and recover from these disasters.

Many farmworkers, landscapers, and workers in parks and public works in Oregon have a Latino background and some have limited English, and certain key training materials and tests are currently only available in English, not Spanish. This creates a barrier to understanding the proper use, storage, and disposal of these hazardous chemicals. This increases the risk to these workers that they will contaminate themselves or their clothing and transport that contamination home to their families and communities.

We urge your support for HB 3058 to protect public health and ensure the responsible and sustainable management of our natural resources and environment.

Thank you for the opportunity to discuss this legislation.

Norman Turrill
LWVOR President

Amelia Nestler
LWVOR Pesticides/Toxics Portfolio

References:

Rotenberg, J. S., & Newmark, J. (2003). Nerve agent attacks on children: diagnosis and management. *Pediatrics*, *112*(3), 648-658.

Qiao, D., Seidler, F. J., Tate, C. A., Cousins, M. M., & Slotkin, T. A. (2003). Fetal chlorpyrifos exposure: adverse effects on brain cell development and cholinergic biomarkers emerge postnatally and continue into adolescence and adulthood. *Environmental health perspectives*, *111*(4), 536-544.

National Pesticide Information Center (NPIC), 2010. "Chlorpyrifos." National Pesticide Information Center, http://npic.orst.edu/factsheets/chlorpgen.html.

Goulson, D. (2018). Call to restrict neonicotinoids. *Science*, *360*(6392), 973-973.

Nicholls, E., Botias, C., Rotheray, E. L., Whitehorn, P., David, A., Fowler, R., ... & Hill, E. M. (2018). Monitoring Neonicotinoid Exposure for Bees in Rural and Peri-urban Areas of the UK during the Transition from Pre-to Post-moratorium. *Environmental science & technology*, *52*(16), 9391-9402.

Hladik, M. L., & Kolpin, D. W. (2016). First national-scale reconnaissance of neonicotinoid insecticides in streams across the USA. *Environmental Chemistry*, *13*(1), 12-20.

Dugger-Webster, A., & LePrevost, C. E. (2018). Following pesticide labels: A continued journey toward user comprehension and safe use. *Current Opinion in Environmental Science & Health*.

CENTER FOR FOOD SAFETY

March 26, 2019

Chair Representative Brian Clem
House Committee on Agriculture and Land Use
Re: Hearing on SB3058

Dear Chair, Vice Chair and Members of the Oregon Legislature:

We are writing to urge your support and passage of House Bill 3058 with a "do pass" recommendation the full House.

HB 3058 would prohibit the use and sale of a brain-damaging insecticide called chlorpyrifos in Oregon, and would require that pollinator-killing "neonicotinoid" insecticides could only be used by licensed pesticide applicators.

Center for Food Safety (CFS)'s mission is to empower people, support farmers, and protect the earth from harmful industrial agriculture. CFS has long worked to end the use of toxic pesticides in industrial agriculture, to protect public health and the environment. With nearly one million members and supporters nationwide and tens of thousands in Oregon, we represent farmers, eaters, and those that live in communities impacted by farming. We support a truly sustainable food system, one that is healthy for both those producing it, communities, and the environment. Toxic pesticides that harm children and kill off wildlife do not support these values. That is why we urge you to support these bills to protect Oregonians from unnecessary and dangerous chemicals.

Chlorpyrifos and neonicotinoids have serious effects on human and environmental health effects. Hawaii has already banned chlorpyrifos due to its extreme danger to children, and anyone exposed. The need to act on these in Oregon is imperative.

Chlorpyrifos is Dangerous for Anyone Near an Application

Sold under various trade names (Lorsban, Dursban and others), chlorpyrifos is used to kill insects and mites in many grains, vegetables, nuts, and fruit crops, as well as in non-food crops such as grass seed, Christmas trees and nursery plants. Strawberries, apples, hazelnuts and corn are some of the common foods grown in Oregon that are frequently treated with chlorpyrifos.

Chlorpyrifos is so toxic that even those a football field away from an application are at risk. The EPA states in its 2016 risk assessment[1] that, in order to reduce human safety risks from drift and volatilization near an application, buffers greater than 300 feet are needed. But buffers of these widths are not currently mandated on labels, and in Oregon, farmworker housing, schools, and other farms are commonly located much closer to an application than 300 feet.

---

[1] U.S. Environmental Protection Agency. 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454.

WASHINGTON D.C. OFFICE
660 Pennsylvania Avenue, SE Suite 402
Washington, D.C. 20003
T: 202-547-9359 F: 202-547-9429

CALIFORNIA OFFICE
303 Sacramento Street, 2nd Floor
San Francisco, CA 94111
T: 415-826-2770 F: 415-826-0507

PACIFIC NORTHWEST OFFICE
2009 NE Alberta Street, Suite 207
Portland, OR 97211
T: 971-271-7372

office@centerforfoodsafety.org centerforfoodsafety.org

Chlorpyrifos in Our Food Exposes All of Us to Substantial Doses of a Neurotoxin

Chlorpyrifos is widely used and applied on a wide variety of crops, so perhaps it is not surprising that it is found in our food at dangerous levels. According to the EPA, in an average diet, Americans unknowingly consume high amounts of chlorpyrifos, resulting in exposures many times levels EPA deems safe. Shockingly, children ages one to two consume chlorpyrifos in food at levels 140 times their "safe" level, according to EPA estimates.[2]

Chlorpyrifos is Harmful to Farmworkers and Their Children

While chlorpyrifos was deemed harmful enough to human health that it was banned years ago for most residential uses, those who grow our food are **not** protected, absorbing chlorpyrifos through the skin and inhalation as they pick and pack and tend the crops. Not only is this risky for the workers themselves – it is also bad news for the children of farmworkers.

Several "longitudinal" studies spanning two decades have allowed us to glimpse a fact that might seem amazing – when pregnant women are exposed to organophosphate pesticides like chlorpyrifos, their children suffer brain development disorders.[3] Studies have shown that of the children born to exposed mothers, infants tend to have slower reflexes,[4] toddlers exhibit autism-like disorders,[5] and seven-year-olds tested with IQs, on average, seven points behind their peers.[6]

And the children of farmworkers are often directly exposed to pesticides as well – by their proximity to the fields while living in substandard migrant housing, and by unknowingly coming into contact with the pesticide residues on the clothing or shoes of their parents when they return from the fields.

The EPA was Set to Ban Chlorpyrifos on Food Crops – Then Trump Administration Suddenly Reversed this Decision in 2017

All of the above-listed human health consequences are well known to the EPA and were documented in its 2016 human health risk assessment. EPA proposed to ban chlorpyrifos use on food crops in 2015, then reversed itself in 2017, keeping it on the market despite its known harms. The New York Times reports that the chemical's manufacturer (Dow Chemical Company)

---

[2] Ibid.

[3] See studies at https://cerch.berkeley.edu/ for CHAMACOS studies, a longitudinal birth cohort study which investigates pesticide and other environmental exposures on the health and development of children living in agricultural communities in the Salinas Valley, California. Other longitudinal studies have found similar results. See studies conducted by Columbia University at https://ccceh.org/and at the Mount Sinai Children's Environmental Health Study (https://icahn.mssm.edu/about/departments/environmental-public-health/cehc).

[4] Young. J., B. Eskanazi [and others] 2005. Association between in utero organophosphate pesticide exposure and abnormal reflexes in neonates. Neurotoxicology 26(2):199-209. https://www.ncbi.nlm.nih.gov/pubmed/15713341

[5] Sagiv, S., M. Harris [and others]2018. Prenatal Organophosphate Pesticide Exposure and Traits Related to Autism Spectrum Disorders in a Population Living in Proximity to Agriculture. Environ. Health Perspect. 126(4): 047012. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6071837/

[6] Bouchard MF, Chevrier J, Harley KG, Kogut K, Vedar M, Calderon N, et al. 2011. Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year- Old Children. Env. Health Perspect. 119:1189-1195. doi:10.1289/ehp.1003185

conducted heavy lobbying prior to EPA's 2017 decision, and contributed $1 million to President Trump's inaugural committee.[7]

Chlorpyrifos is Detected in Oregon's Streams and Rivers, Sometimes at Extremely High Levels

To cap it off, chlorpyrifos also gets into our streams, threatening our already diminished salmon and steelhead. Chlorpyrifos is regularly detected in Oregon streams at levels far above its Clean Water Act standard, sometimes at levels hundreds of times higher than this safety threshold.[8] And the trend is worsening in some areas, including in the Middle Deschutes, Yamhill, and Walla Walla watersheds. Concentrations similar to those found in Willamette Valley streams have been found to:

- Kill salmon prey, such as caddisflies, mayflies, stoneflies, and daphnids.[9]
- Affect fish ability to smell and swim, both critical salmonid behaviors.[10]
- Become more toxic as water warms. At 66°F, chlorpyrifos is seven times more toxic to trout than at 55°F.[11]

The country's premier fish agency has weighed in on chlorpyrifos and its effect to threatened and endangered salmon and steelhead, with a dire warning. In 2017, the National Marine Fisheries Service determined that chlorpyrifos jeopardizes the survival and recovery of all listed salmon and steelhead in Oregon, Washington and California. Orca whales in Washington are also jeopardized by chlorpyrifos.

Pollinators Need Protection Against Extremely Toxic Neonicotinoids as Multiple Countries Have Recognized

HB 3058 and SB 853 would also make the neonicotinoid class of insecticides "restricted use," meaning that people who don't have an Oregon license to apply pesticides wouldn't be able to buy and use these chemicals, which are widely sold in garden centers and big box stores with no education about their grim effects.

---

[7] Lerner, S. 2017. Protect Our Children's Brains. New York Times, February 3, 2017. https://www.nytimes.com/2017/02/03/opinion/sunday/protect-our-childrens-brains.html?_r=0

[8] See monitoring studies under Oregon's Pesticide Stewardship Partnership Program at https://www.oregon.gov/ODA/shared/Documents/Publications/PesticidesPARC/GreaterYamhillSummary.pdf and https://www.oregon.gov/ODA/shared/Documents/Publications/PesticidesPARC/ClackamasSummary.pdf.

[9] U.S.EPA. 2003. Chlorpyrifos Analysis of Risks to Endangered and Threatened Salmon and Steelhead. Office of Pesticide Programs. Cited in National Marine Fisheries Service. 2008. pp. 269-271. See also National Marine Fisheries Service. 2017. Endangered Species Act Section 7 Final Biological Opinion: Environmental Protection Agency's Registration of Pesticides Containing Chlorpyrifos, Diazinon and Malathion, p. B-16.

[10] Sandahl J., Baldwin D. [and others]. 2004. Odor-evoked field potentials as indicators of sublethal neurotoxicity in juvenile coho salmon (Oncorhynchus kisutch) exposed to copper, chlorpyrifos, or esfenvalerate. Canadian Journal of Fisheries Aquatic Sciences 64:404-413. See also Sandahl J., Baldwin D. [and others]. 2005. Comparative thresholds for acetylcholinesterase inhibition and behavioral impairment in coho salmon exposed to chlorpyrifos. Environmental Toxicology and Chemistry 24:136-145.

[11] National Marine Fisheries Service. 2008. Endangered Species Act Section 7 Consultation Biological Opinion. U.S.EPA Registration of Pesticides Containing Chlorpyrifos, Diazinon, and Malathion. See pages 269-270.

WASHINGTON D.C. OFFICE
660 Pennsylvania Avenue, SE Suite 402
Washington, D.C. 20003
T: 202-547-9359 F: 202-547-9429

CALIFORNIA OFFICE
303 Sacramento Street, 2nd Floor
San Francisco, CA 94111
T: 415-826-2770 F: 415-826-0507

PACIFIC NORTHWEST OFFICE
2009 NE Alberta Street, Suite 207
Portland, OR 97211
T: 971-271-7372

office@centerforfoodsafety.org centerforfoodsafety.org

CENTER FOR FOOD SAFETY

Neonicotinoids are a class of insecticides that are highly persistent and highly toxic to bees, beneficial insects, and aquatic invertebrates. Because they are highly soluble they are also prone to drifting from yards and fields to water, resulting in massive contamination of surface waters with neonics across the country.[12]

Numerous incidents involving bee deaths have been tied to neonicotinoids. As one result, multiple other countries and jurisdictions have banned or regulated neonicotinoids. In 2018, the European Union banned three neonicotinoids (clothianidin, imidacloprid and thiamethoxam) for all outdoor uses. Ontario has restricted the use of neonicotinoid seed treatments. And multiple cities in the United States and elsewhere have banned use of neonicotinoids on city property.

The persistence of neonicotinoids in plants results in a risk for a toxic exposure to pollinator-visiting insects long after the application. Bayer, the chemical manufacturer for imidacloprid (the most widely used neonic), found in its own studies very high residues of imidacloprid from soil applications to landscape plants, long after application.[13] An independent university study corroborated the high residue rates documented in the Bayer data, with residues ranging from 6,000-45,000 ppb in treated plants, and also documented impacts to butterflies and beneficial insect predators.[14]

These residue levels are mostly far higher than those known to cause lethal effects to honey bees (185 ppb) and illustrate the very high persistence of neonicotinoids in woody flowering plants.

Less obvious types of toxic effects ("sub-lethal" effects) from neonicotinoids can also occur. Bumblebee colonies exposed to field-realistic concentrations of imidacloprid had significantly reduced growth rates and an 85% reduction in queen production.[8] Various studies have also documented reduced bee foraging ability after very low, field realistic exposures. Sub-lethal effects can gradually result in population level effects – and the amounts at which impacts have been documented are vanishingly small. An EPA risk assessment considering the effects of a neonic (imidacloprid) identified a nectar residue level for imidacloprid of 25 ppb, above which the assessment concluded that effects on honey bee hives are likely. These effects may include reduction in numbers of pollinators as well as the amount of honey produced.[15] In addition, the EPA acknowledges "major (and statistically significant) effects" to bumblebee colonies fed imidacloprid-spiked sucrose at 10 ppb.

---

12 Hladik, M.L., Kolpin, D.W., 2016, First national-scale reconnaissance of neonicotinoid insecticides in streams across the U.S.A., *Environ. Chem.*, v. 13, pp. 12-20, https://ca.water.usgs.gov/pubs/2015/HladikKolpin2015.pdf.

13 Bayer measured dogwood flowers 17 months after application containing 1,038–2,816 parts per billion (ppb) of imidacloprid. Other Bayer studies found residues of 27–850 ppb in rhododendron flowers at 6 months after application; and residues of 66–4,560 ppb in serviceberry flowers at 18 months after application. Data cited in Krischik V, M. Rogers [and others]. 2015. Soil-applied imidacloprid translocates to ornamental flowers and reduces survival of adult Coleomegilla maculata, Harmonia axyridis, and Hippodamia convergens lady beetles, and larval Danaus plexippus and Vanessa cardui butterflies. PLoS ONE 10(3): e0119133. doi:10.1371/journal.pone.0119133.

14 Krischik V., Rogers M. [and others]. 2015. (Previous footnote).

15 Environmental Protection Agency. 2016. Preliminary Pollinator Assessment to Support the Registration Review of Imidacloprid. https://www.regulations.gov/ #!documentDetail;D=EPA-HQ-OPP-2008-0844-0140.

Requiring a License for the Most Toxic Pesticides Makes Sense

We support the move to make neonicotinoids restricted use in Oregon. Requiring a license guarantees that the person using a pesticide has had the benefit of training and can pass a test demonstrating knowledge about basic pesticide safety practices. Licensed applicators need to get continuing education to keep up with the latest science and rules. Anyone who wants to use a pesticide, especially those known to be as dangerous as neonics, should have an applicator license.

Farmers Adapt and Lead the Way

Farmers are already working together to share information about safer practices, leading the way to less toxic food production. First, organic farmers have been producing healthy food for years without the use of chlorpyrifos or any neonicotinoids. And for the conventional or non-organic growers, they too recognize that it is in their long term best interest to move to more sustainable and healthy pest manage practices. For example, in Oregon's nursery industry, educational efforts by Oregon State University Extension and leadership by growers and insectaries has greatly expanded the number of growers using biological control to manage insect pests. Many growers already recognize that harsh, broad-spectrum pesticides like chlorpyrifos and neonicotinoids result in resistance – the bugs evolve a tolerance to the pesticide and come back even stronger.

Conclusion

We urge you to please support these bills, which will protect Oregon children, farm workers, farmers, and fish.

Sincerely,

Amy van Saun
Senior Attorney
Center for Food Safety
2009 NE Alberta St. Suite 207
Portland, Oregon 97211

Angel Torres Testimony on HB3058

My name is Angel Torres and I am a Crop Advisor/agronomist in Salem, Oregon, and the surrounding area. I graduated with a degree in Crop & Soil Science with the option in Agronomy from Oregon State University and have been engaged with research both at Oregon State University with the Department of Animal and Rangeland Sciences and at Michigan State University at the Department of Plant, Soil and Microbial Sciences. My job is to give growers advice on how to raise successful crops which includes informing and recommending the proper use of various pesticides to treat undesirable insects, weeds, diseases and more. One of our tools is Chlorpyrifos.

I was raised in an agriculture community and family in Albany. I am not a farmer, but at the early age of 14, I started working in many of the crops that are being listed that are treated with Chlorpyrifos. I have spent many long hours working in fields that are farmed conventionally with various pesticide tools. I can speak for our field workers that farmers are diligent about ensuring the safety of their workers and surrounding communities. As crop advisors, we ensure that the applicator and farmer know the federal standards, laws, and regulations of using a product, although it ultimately falls on the applicator to follow labeled uses, by law as Oregon licensed advisors, we recommend and give advice strictly and only on labeled uses. An example directly related to this is giving the re-entry Interval (REI) for any product that the label requires us to follow which limits the exposure and risk of a pesticide. As crop advisors, we value and respect the importance of having tools such as chlorpyrifos. Even more importantly we rely heavily on the Lorsban Advanced Insecticide that gives us 6 Section 24(c) Special Local Needs labels, and 2 Special 2(ee) recommendations in Oregon:

24(c):

1. For Control of Garden Symphylans in Table and Sugarbeets or Swiss Chard Grown for Seed
2. For Control of Insects Infesting Perennial Grass Grown for Seed
3. For Control of Various Insects Infesting Clover Grown for Seed
4. For Control of Cutworms and Lygus Infesting Carrots Grown for Seed
5. For Control of Cutworms Infesting Radish Grown for Seed
6. For Control of Various Insects infesting Cottonwood/Poplar Grow for Pulp or Wood

2(ee):

1. For Control of Flatheaded Borer in Filbert
2. For control of Root Maggots, Cutworms, Symphylans, Billbugs, Wireworms, Grubs in Veg

I would like to speak for one of the many important uses that the labeled use of chlorpyrifos has. For the early part of my career, I have worked for 7 years in the hazelnut industry. I have seen how devastating certain pests and disease outbreaks can have on our food supply including our state nut that was declared by our own legislatures in 1989. One of those pests is the Pacific flatheaded borer. The Pacific flatheaded borer (Chrysobothris mali) is a Coleoptera that attacks weak or declining hazelnut (filbert) trees in Oregon. Oregon produces over 99% of the nation's hazelnuts. Not treating this pest would be devastating to our industry. Taking just one of the incredibly few tools to combat such pest would cripple our growers' ability to fight this pest. When used in full compliance with labeled guidelines, chlorpyrifos has been proven very effective and safe to use on the flat-headed borer. Oregon State University Extension Service has done research on its effectiveness. Not is it only effective on flat headed borer in hazelnuts but it is also an important tool in many important crops of Oregon.

Using common sense, sound agronomic practices, following federal and state regulations, and using integrated pest management strategies, as a crop advisor, removing chlorpyrifos would negatively affect our ability to combat already hard to control pests. I urge our legislators to read and understand product labels before making misinformed decisions. I truly believe our consumers should have the fullest transparency of our practices, but they shall not be guided by misinformation and fear tactics. Having a misinformed society limiting our ability to feed our growing population is truly worrisome. **I strongly urge you to vote NO on HB 3058.**

Angel Torres
Crop Advisor
Albany, OR

From: anna@growingpeace.net
To: Exhibits HAGLU
Subject: HB 3058
Date: Sunday, March 24, 2019 12:41:33 PM

To: House Committee on Agriculture and Land Use
From: Anna Cassilly
Talent, OR
Re: HB 3058

Honorable Representatives –
I am writing to ask you support of HB 3058. This bill would add neonicotinoids to Oregon's list of Restricted Use Pesticides and prohibits the sale, purchase or use of chlorpyrifos pesticides.

Chlorpyrifos is a neurotoxic pesticide that is very harmful to children, pregnant women, farmworkers, wildlife and beneficial insects. The EPA was ordered by federal courts to ban this dangerous pesticide from use on food crops. We cannot wait for action at the federal level. We must act now to protect all Oregonians, as well as the ecosystems that sustain us.

Neonicotinoids are highly toxic to bees, beneficial insects, fish and birds. There is also mounting evidence* that neonicotinoids may be associated with congenital heart defects, neural tube defects, and autism spectrum disorder as well as being capable of disrupting normal hormone function in humans. Neonicotinoids should not be readily available at the local lawn and garden store; they should only be applied by trained and licensed personnel, and hopefully within the scope of an integrated pest management program.

Thank you for your consideration of this important bill.

Anna Cassilly
Talent, OR
*Cimino, A. M., Boyles, A. L., Thayer, K. A., & Perry, M. J. (2017). *Effects of neonicotinoid pesticide exposure on human health: a systematic review*. Environmental health perspectives, 125(2), 155.
^^
If I'm using Nonviolent Communication I never, never, never hear what somebody thinks about me... Hear the truth. The truth is that when somebody's telling you what's wrong with you, the truth is they have a need that isn't getting met. Hear that they're in pain.

Marshall Rosenberg
^^
Anna Cassilly
Growing Peace
www.growingpeace.net
anna@growingpeace.net
541-301-7993
^^

From:	Barbara Comnes
To:	Exhibits HAGLU
Subject:	HB 3058
Date:	Monday, March 25, 2019 2:33:33 PM

Dear Members of the House Agriculture and Land Use Committee:

I support HB 3058. I am writing to urge you to do so, as well.

House Bill 3058 would ban the use of chlorpyrifos, a toxic nerve agent pesticide proven to cause brain damage in children, contaminate waterways and harm wildlife. It would also restrict the use of bee-killing neonicotinoids to licensed professionals only, thus removing them from store shelves. The bill would make it easier for affected agricultural interests to get the training they need by reducing certification costs while also increasing the annual fee paid by pesticide manufacturers.

This is all very positive for the citizenry of Oregon, our environment, and our agricultural workers. Please support HB 3058.

Sincerely,
Barbara Comnes
444 Park Ridge Pl
Ashland OR 97520

From: Bill Merrigan
To: Exhibits HAGLU
Subject: HB3058
Date: Saturday, March 23, 2019 11:01:55 AM

Dear Representatives,

I am writing to register my opposition to HB 3058 which would ban the sale and use of Chlorpyrifos in the state of Oregon and also make all neonicotinoids restricted use in the state.

Oregon has vast diversity in agriculture production and pest control products with these active ingredients are vital in producing high quality, pest free products that meet phytosanitary requirements around the world. It would be particularly harmful to our seed production industry in this state as there are very few registered options available to producers. It would put agriculture in Oregon at a competitive disadvantage with producers in other states.

We have demonstrated decades of safe and affective use of these products and thousands of studies have been done on these active ingredients and the EPA has continued to support their registrations and usage. I urge you to utilize state and federal agencies to make these decisions based on sound scientific date rather than allowing this dangerous precedent of Legislative action dictating what agriculture producers can and cannot use to protect their seed crops from pests.

Again I ask for your vote in opposition of HB 3058. Thank you for your consideration.

Bill Merrigan
Imbler, Oregon

OREGON WHEAT

"The Voice of Oregon's Wheat Producers Since 1926"

OREGON WHEAT GROWERS LEAGUE

115 SE 8th Street Pendleton, OR 97801 541.276.7330 www.owgl.org

browe@oregonwheat.org

Blake Rowe, Chief Executive Officer

TO: Rep. Brian Clem, Chair, Committee on Agriculture and Land Use
Members of the Committee

FR: Blake Rowe
CEO, Oregon Wheat Growers League

Date: March 26, 2019

RE: HB 3058

The Oregon Wheat Growers League is proud to represent the nearly 2000 farms across Oregon that produce wheat, one of our State's largest and most valuable crops. Wheat contributes hundreds of millions of dollars in direct and indirect value to Oregon's economy, especially Oregon's rural economy. Ninety percent of Oregon's wheat is exported to customers around the world. Both price and quality are keys to our ability to compete for markets and neonicotinoid crop protection products are vital to our competitiveness.

OREGON WHEAT GROWERS NEED ACCESS TO SAFE, AFFORDABLE, AND EFFECTIVE CROP PROTECTION PRODUCTS TO PRODUCE HIGH YIELDING AND HIGH-QUALITY WHEAT CROPS. NEONICOTINOID SEED TREATMENTS ARE THE MOST EFFECTIVE TOOL TO PROTECT WHEAT SEEDS AND YOUNG WHEAT PLANTS.

Wheat plants are susceptible to numerous insects and diseases that result in loss of yield and quality. For some destructive soil-borne insects such as wireworms, there are no alternative products for wheat growers. Neonicotinoid seed treatments are the only labeled product for wireworm control in wheat. These seed treatments are also effective in controlling insects like aphids, that attack new wheat plants and transmit diseases like barley yellow dwarf virus.

It is important that Legislators understand that wheat seeds treated with neonicotinoids don't pose any risk to pollinators. Not only are the seeds planted directly into the soil, but wheat also doesn't have traditional "flowers" and depends on wind, not pollinators, for pollination.

We want to be absolutely clear that we see no justification to change neonicotinoids to restricted use products in Oregon. However, if the Legislature decides to move forward and make neonicotinoids restricted use products, it is vital that the Oregon Department of Agriculture be directed to immediately undertake administrative rule making for Oregon to ensure that farmers can continue to access and use the products. We can't afford to have them unavailable for even one growing season, so ODA will need to act immediately.

We urge you to follow the best science and insure that neonicotinoids remain available to Oregon's wheat growers by opposing HB 3058.

House Committee on Agriculture and Land Use
Oregon Legislature
900 Court St. NE,
Salem Oregon 97301

Dear Representative Clem and Members of the House Committee on Agriculture and Land Use,

I am writing on behalf of the Audubon Society of Portland and our 17,000 members in support of House Bill 3058 and its companion legislation in the Senate, SB 853. SB 853 and HB 3058 would prohibit the use and sale of the insecticide, chlorpyrifos in Oregon and would restrict use of neonicotinoid pesticides to licensed pesticide applicators. We believe that both of these actions are essential to protect communities and the environment.

Chlorpyrifos is a highly toxic organophosphate insecticide related to nerve gas that is used on a wide variety of crops which puts consumers, farm workers and the fish, wildlife and invertebrates at extreme risk. The EPA proposed to EPA proposed to ban chlorpyrifos use on food crops in 2015, then reversed itself in 2017 under heavy pressure from the insecticides manufacturer, Dow Chemical Company.

A biological evaluation produced by the EPA in cooperation with the US Fish and Wildlife Service and the National Marine Fisheries Service found that chlorpyrifos was "likely to adversely affect" 1778 out of 1835 federally listed fish, bird, mammal, reptile, amphibian, invertebrate and plant species reviewed. This included 91 out of 108 bird species.

This highly toxic insecticide simply posed too high of a risk to people and the environment and Oregon should move forward aggressively and do what the federal government has failed to do and ban this insecticide.

Neonicotinoids are persistent and widely used pesticides that are causing well documented harm to wildlife and in particular, pollinators. The dramatic impacts that neonicotinoids have on bees and other pollinators has appropriately received tremendous attention in recent years. In Oregon, seven neonicotinoid insecticide applications in the summers of 2013 and 2014 caused the death of nearly 100,000 bumble bees, representing hundreds of colonies. Poisoning incidents occurred in Beaverton, Eugene, Portland, Wilsonville and other cities. However, bees are just the tip of the iceberg. Neonicotinoids eliminate a wide array of terrestrial and aquatic invertebrates on which many species including salmon and birds depend. With regards to birds, neonicotinoids can have profound impacts:

- A single seed treated with neonicotinoids can kill a songbird;
- Chronic exposure to neonicotinoids can have significant sub-lethal effects including decreased fecundity;
- Neonicotinoids destroy the insects which many bird species depend on for survival.

Classifying neonicotinoids as "restricted use" in Oregon would allow for their continued use, so long as applicators receive training and certification on how to do so safely. Oregon currently requires certification and training in order to buy or use over 500 restricted pesticides. Adding neonicotinoids to this list is a common sense step to minimize the risk of harm to bees, other pollinators, freshwater invertebrates, fish and birds.

We strongly encourage you to pass SB 853 and HB 3058,

Thanks you for your consideration of these comments.

Respectfully,

Bob Sallinger

Bob Sallinger
Conservation Director
Audubon Society of Portland

March 26, 2019

House Agriculture & Land Use Committee

Dear Committee Members;

I am writing concerning HB 3058 which is scheduled for a hearing in the House Agriculture & Land Use Committee. I have been an agricultural advisor for almost 30 years. My degree is through Oregon State University in the schools of Agriculture and Education. Having been involved in agriculture all my life, I have a pretty good understanding of our practices and science. Being the son of a retired University Extension Agent and former legislator, I have witnessed and been involved in the political process as well. I have used and sold many gallons and pounds of products containing chlorpyrifos which this bill, HB 3058 proposes to ban. I have the same experience with neonicotinoid insecticides. When labels are properly followed, both products are great tools for our use in the production of food and fiber. When people die or are injured in auto accidents due to not wearing their seatbelts, we don't ban cars. We have laws, regulation and education in place to help prevent these things from happening.

I am concerned when the legislature takes it upon themselves to take the authority to ban products based on what some people want that is not supported by good science. What is the purpose of having state and federal regulators if the legislature is going to impose their will on our people and our industries that provide for our food and fiber? Is it the legislatures responsibility with their limited knowledge to make decisions on every product used in our state?

The diversity of Oregon agriculture is possible because of the great conditions we have for growing so many crops but it is not easy because all our crops are considered "minor crops." We must rely on many local needs approved labels for products that we are able to get from manufacturers only because they have developed them for the "major crops". Our tools for pest control, including weeds, insects, disease, rodents, mollusks, etc. are limited and the products that are addressed in this proposed legislation add another large challenge to and industry constantly being scrutinized for just about everything involved in producing food and fiber.

Thank you for your consideration.

Respectfully,

Bob Schroeder

7231 NE Arnold Ave.

Adair Village, OR 97330

To: House Committee on Agriculture and Land Use
Chair Clem
Vice Chair McClain
Vice Chair Post
Rep. Boshart Davis
Rep. Helm
Rep. Brock Smith
Rep. Williams

From: Bob Van Dyk, Wild Salmon Center

Date: March 25, 2019

RE: Support for HB 3058 re: restrictions on chlorpyrifos and neonicotinoids

Chair Clem and Members of the Committee:

For the record, my name is Bob Van Dyk, and I lead the Oregon policy efforts for the Wild Salmon Center. Wild Salmon Center works with partners to conserve healthy wild salmon fisheries across the North Pacific.

Thank you for the opportunity to submit this testimony in support of HB 3058, which prohibits the use of chlorpyrifos and limits the use of neonicotinoid insecticides to licensed applicators.

We believe the record regarding these pesticides is sufficient to support the restrictions proposed in HB 3058.

Regarding the revocation of licenses for products containing chlorpyrifos, we call your attention to the negative effects of chlorpyrifos on salmonids.[1] For example, for Oregon Coast coho, which are listed as threatened with extinction under the Endangered Species Act, NOAA concluded the following:

> Given the life history of Oregon Coast coho salmon, we expect the proposed uses of chlorpyrifos, diazinon, and malathion pesticide products that contaminate aquatic habitats may lead to both individual fitness level consequences and subsequent population level consequences, i.e., reductions in population viability. The widespread uses of these materials indicate substantial overlap with the 11

[1] U.S. EPA. Chlorpyrifos Analysis of Risks to Endangered and Threatened Salmon and Steelhead. Office of Pesticide Programs. Cited in National Marine Fisheries Service. 2008. pp. 269-271. See also National Marine Fisheries Service. 2017. Endangered Species Act Section 7 Final Biological Opinion: Environmental Protection Agency's Registration of Pesticides Containing Chlorpyrifos, Diazinon and Malathion, p. B-16.

INTERNATIONAL HEADQUARTERS
721 NW Ninth Avenue, Suite 300 • Portland, Oregon 97209 USA • tel: 503.222.1804 • fax: 503.222.1805
info@wildsalmoncenter.org • www.wildsalmoncenter.org

> populations that comprise the Oregon Coast coho salmon. *The risk to this species' survival and recovery from the stressors of the action is high*.[2]

Other studies have reached conclusions regarding the threat of chlorpyrifos to aquatic organisms.[3] Given the wide range of stressors on Pacific salmonids, we support a precautionary approach to the use of chlorpyrifos, and thus support the prohibition implemented by HB 3058.

Similarly, the changed categorization of neonicotinoids proposed in HB 3058 is a prudent measure given the growing scientific record regarding the wide variety of potential negative effects from this insecticide. As 30 scientists recommended in the recent "Conclusions of the Worldwide Integrated Assessment on the Risks of Neonicotinoids and Fipronil to Biodiversity and Ecosystem Functioning,"[4]

> regulatory agencies [should] consider applying the principles of prevention and precaution to further tighten regulations on neonicotinoids and fipronil and consider formulating plans for a substantial reduction of the global scale of use.[5]

HB 3058 would not ban this insecticide, but simply move it to a more appropriate category that requires training to ensure proper use. We support that approach.

Thank you for the opportunity to provide testimony on this important matter.

---

2 Ibid, p. 366. Emphasis added.

3 Sandahl J., Baldwin D., et. al. 2004. Odor-evoked field potentials as indicators of sublethal neurotoxicity in juvenile coho salmon (Oncorhynchus kisutch) exposed to copper, chlorpyrifos, or esfenvalerate. Canadian Journal of Fisheries Aquatic Sciences 64:404-413. See also Sandahl J., Baldwin D. et. al. 2005. Comparative thresholds for acetylcholinesterase inhibition and behavioral impairment in coho salmon exposed to chlorpyrifos. Environmental Toxicology and Chemistry 24:136-145.

4 J. P. van der Sluijs, et. al. 2015. Conclusions of the Worldwide Integrated Assessment on the Risks of Neonicotinoids and Fipronil to Biodiversity and Ecosystem Functioning. Environmental Science and Pollution Research 22:148–154

5 Ibid at p. 153.

From:	Brenda Frketich
To:	Exhibits HAGLU
Subject:	Please oppose SB 853 & HB 3058
Date:	Tuesday, March 26, 2019 10:20:06 AM

Dear Chair Clem,

My name is Brenda Frketich. I am third generation farmer from St. Paul. I farm 1000 acres alongside my husband Matt and our three small children. We are a sustainable and diverse farm raising filberts, grass seed, wheat, clover, vegetables and vegetables seeds.
I'm writing in opposition to SB 853 & 3058. I'm here as you heard as a farmer, as a certified applicator, and as a mother. I am also a farmer's daughter who was raised on the same land and in the same dirt that my kids now play in.
I'm opposed to SB 853 & 3058 for six reasons:

1. We need these tools in our toolbox.
2. We have no good alternatives.
3. We use these products safely and carefully.
4. Chlorpyrifos: As a restricted use pesticide it is already heavily tested and regulated.
5. Both are regulated both federal and at the state level.
6. Neonicotinoids: Are used not only by farmers who have pesticide licenses.

We need these tools in our toolbox.
We use chlorpyrifos on our farm for a number of crops that we grow. One example is our radish for seed. This crop is planted in the spring, we actually just put ours in the ground last week. We use chlorpyrifos 15G, granular in the row with the seed as we plant. The granular material goes into the furrow and is then covered with dirt. It then protects the seed as it grows from root maggots. This is a necessary treatment because it is hard, once a seed is in the ground, to protect it from pests. We also use it as a pre-plant application in some instances when planting vegetable seeds. This would be an application where it is sprayed onto the soil, then worked into the soil using a cultivator or harrow mix it into the soil. We do this only in the fields where symphylans are present or have been in the past.
We have no good alternatives to use.
The alternatives (if you can call them that, are not very comparable in quality or cost). There is only maybe one labeled that we would sort of consider, it's so expensive, 5 times the cost of chlorpyrifos per acre ($20 vs $100). It also is unpredictable if you can't control how much rain hits the soil after application, because that greatly determines how much control you have on root maggot. We also are working with a small industry of seed varieties. Getting a new label or just trying to get the residuals and testing done for a new product or to get your crop listed on an existing chemical is near impossible and takes years to accomplish.
We use this safety and carefully.
Not only am I a licensed applicator, which comes along with many hours of continuing education very year. We also annually train all our employees on our farm, which is a requirement from OR-OSHA under their Worker Protection Standards. We use the correct personal protective equipment that is listed on the label, following cleaning and disposal label information, and only use it on crops that are listed on the label. The label is the law and that is so true when we use this insecticide on our farm.
As a restricted use pesticide it is already heavily tested and regulated.
This chemical is already under federal and state regulation. To even purchase this chemical I have to prove that I have a pesticide license and have continuing education about the correct way to apply chemicals on our farm. It is regulated with our state agencies and at the federal level with the EPA.
This is a tool has been tested in over 4000 studies just around safety to children. It has not shown to cause birth defects or developmental disorders in children. With three small children of my own, this is information that is important to me. It is also a biodegradable compound that does break down in the environment. The chemical compounds are then gone. Two examples of this are microbial activity within the soil and with sunlight. On the radish that we plant, we actually only would have to wait only 7 days before we harvest after application (we wait much longer because it takes 5 months for the crop to produce seed). But this is another example that the insecticide actually does break down in the environment, adding to the story of safety surrounding this chemical.
I am a mom who wants her children to be safe, and I am a farmer who strives for crop and soil health. This is one tool that when used per the label, I can satisfy human and environmental safety at the same time.

As far as the neonicotinoids all being classified as restricted use, I think this is a gross overreach by the legislature. These products range from farmer applied all the way down to someone putting a flea collar on their dog. To force everyone who uses these products to be licensed is ridiculous and quite frankly unnecessary. The bee kills that happened were off label applications, and there was a cost to that. Both as a penalty and to bees that died. It is sad to see that happen, but it is also why we have regulations in place to stop that from happening.
Thank you for your consideration on this important issue.

Brenda Frketich

Sincerely,

Brenda Frketich
16493 French Prairie Rd NE
Woodburn, OR 97071
brenda@kirschfamilyfarms.com

From: Brian Parker
To: Exhibits HAGLU
Subject: Please vote NO on HB3058
Date: Tuesday, March 26, 2019 10:44:17 AM

Regarding HB3058 and SB 853: Please vote NO

My family has farmed in the Willamette Valley for 35 years. We live in the house my wife grew up in. We have 10 full time employees who make family wage jobs with benefits.

Regarding removal of Chlorpyrifos in Oregon:

A: I submit that Oregon Legislators do not have the expertise or scientific knowledge to be able to decide whether pesticides should be allowed or not. We have a regulatory system in place to decide these matters. It has worked very well for many years at the federal as well as the state level.

B: Though we do not always use this product, it represents a different chemistry that sometimes is needed for certain uses and to prevent resistance buildup caused by using other chemicals with the same mode of action. Removing this tool from our list of allowed items will cause other tools to lose effectiveness.

C: If the state legislature feels it has the right to remove our tools based on their own ideas, rather than science, then it becomes a great concern to me whether the future of my business can be sustained. I will be forced to run my business without knowing in advance of what the rules are to be.

Many in agriculture are greatly worried that Oregon will increasingly be a state where it is difficult or impossible to do business in an increasingly expensive and regulatory environment. My wife and I, both born in Oregon, are increasingly worried there will be no future here for Agriculture.

Please understand the ramifications of what you are thinking of doing. If this passes, then what may we expect in the future, more micromanagement from the state legislature?

Sincerely,

Brian Parker
Parker Seeds, Inc.
Junction City, OR 97448
541-520-3800

Prepared Statement of Dr. Bruce Lanphear

Testimony in Support of HB 3058
March 26, 2019

Members of the Committee:

Thank you for the opportunity to testify. My name is Bruce Lanphear. I am a physician and a professor in Health Sciences at Simon Fraser University and a Clinician Scientist at BC Children's Hospital Research Institute in Vancouver, British Columbia.

I have studied the impact of toxic chemicals, like lead and OP pesticides, on children's brain development for over 20 years. I have also served on numerous scientific committees on environmental health issues impacting children, including the Executive Council on Environmental Health for the American Academy of Pediatrics. I am the current President of the International Society for Children's Health and the Environment, which promotes high-quality research and advocates to protect children from toxic chemicals.

I am here to urge you to support HB 3058 that will prohibit the use of chlorpyrifos in Oregon and protect children from this toxic chemical.

One in six American children has a developmental problem, from a subtle learning disability to overt behavioral disorders, such as ADHD, anxiety and autism (Boyle, 2011; Lanphear, 2015). These brain-based disorders can seriously impair a child's ability to succeed in school, reduce their lifetime earnings and diminish their ability to contribute to society.

Over the past 30 years, we have learned that toxic chemicals, like lead, PCBs and organophosphate pesticides, are risk factors for these brain-based disorders (Lanphear, 2015).

We have learned that toxic chemicals, like chlorpyrifos, can substantially impact brain development and radically alter children's life trajectory. Some toxic effects may not become manifest until years after exposures occur (Hertz-Picciotto, 2018).

Studies have consistently – if not universally – shown that OP pesticides and chlorpyrifos are toxic, even at very low levels (Hertz-Picciotto, 2018).

In one systematic review, the adverse effects of OP pesticides on learning and behavioral problems in children were observed in all but one of the 27 studies, especially for exposures that occur during brain development (Gonzalez-Alzaga, 2013).

Studies have shown that children who are exposed to chlorpyrifos are at greater risk for developing IQ deficits and ADHD; there is emerging evidence that chlorpyrifos exposure during fetal development increases the risk for autism (Hertz-Picciotto, 2018; von Ehrenstein, 2019).

The toxicity of early-life exposure to chlorpyrifos on neurodevelopmental end points has been confirmed in experimental animal studies (US EPA, 2014; Slotkin, 2005).

How could this happen? Chlorpyrifos and other OP pesticides were licensed for use as insecticides before requirements to evaluate them for human toxicity and ecologic impacts were established (Hertz-Picciotto, 2018).

When I was trained in medicine 30 years ago, I was taught that low-level exposures to toxic chemicals were safe or innocuous. Over the past 20 years we have learned that there is no threshold or safe level for some of the most well-studied toxic chemicals, like lead and organophosphate pesticides (Lanphear, 2015).

We have also learned that the developing brain is usually more vulnerable to toxic chemicals.

Brain cells grow rapidly during fetal development and early childhood, and rapidly growing cells are more vulnerable to toxic chemicals. Indeed, this is the same principle used to treat how cancer patients: cancer patients are given toxic chemicals with the hope that the fast-growing cells – cancer cells – will preferentially uptake the poisons and die.

Over 80% of pregnant women and children are regularly exposed to organophosphate pesticides, mostly from food. Children who live on or near farms and golf courses are often more heavily exposed to chlorpyrifos and other pesticides (Hertz-Picciotto, 2018).

The chemical industry has tried to assure us that concentrations of these toxic chemicals are too small to cause harm. But that is misleading. Chemicals can be toxic, even at very low levels.

University of California scientists reported that, as the level of organophosphate pesticides in pregnant women increased from 10 to 75 ppb, the IQ scores of their children dropped by about 5 points (Bouchard, 2011).

This is tragic for a child, but it is devastating at a population level. If we shifted an entire six-year birth cohort of American children IQ by 5 points, it would result in a 50% increase in the number of American children who have an IQ below 70 points, from 6 million to 9.4 million. There would be a corresponding decrease in the number of children that are gifted, from 6 million to 2.4 million (Lanphear, 2015).

The impact of OP pesticide exposure adds up: David Bellinger estimated a loss of 16 million IQ points for a six-year birth cohort of US children from OP pesticide exposures (Bellinger, 2012). The cost of not protecting children from chlorpyrifos is substantial. For each IQ point lost, a child's lifetime earnings will decrease by about $15,000.

In summary, the science is clear and consistent: chlorpyrifos is putting the health of our children at risk for brain-based disorders that can have lifelong impacts and diminish their opportunity to thrive.

References

1. Bellinger DC. A strategy for comparing the contributions of environmental chemicals and other risk factors to neurodevelopmental of children. Environ Health Persp 2012;120:501-507.
2. Bouchard MF, Chevrier J, Harley KG, et al. Prenatal exposure to organophosphate pesticides and IQ in 7-Year old children. Environ Health Perspect 2011;119:1189-1195.
3. Boyle CA, Boulet S, Schieve LA, et al. 1994. Trends in the prevalence of developmental disabilities in US children. Pediatrics 127:1034-1042.
4. Chen J, Kumar M, Chan W, Berkowitz G, Wetmur JG. 2003. Increased influence of genetic variation on PON1 activity in neonates. Environ Health Perspect 111: 1403-1409.
5. Gonzalez-Alzaga B, Lacasana M, Aguilar-Garduno C, et al. A systematic review of neurodevelopmental effects of prenatal and postnatal organophosphate pesticide exposure. Toxicol Letter 2014;230:104-121.
6. Hertz-Picciotto I, Sass JB, Engel S, et al. Organophosphate exposures during pregnancy and child neurodevelopment: Recommendations for essential policy reform. PLoS Medicine 2018;15(10):e1002761.
7. U.S. EPA. EPA Revised Human Health Risk Assessment on Chlorpyrifos. December 2014. Docket ID EPA-HQ-OPP-2008-0850. Available from: http://www.epa.gov/ingredients-used-pesticide-products/revised-human-health-risk-assessment-chlorpyrifos
8. Von Ehrenstein OS, Ling C, Cui X, et al. Prenatal and infant exposure to ambient pesticides and autism spectrum disorder in children: population based, case-control study. BMJ 2019; 364 doi.ort/10.1136/bmj.1962
9. Slotkin TA, Seidler FJ. The alterations in CNS serotonergic mechanisms caused by neonatal chlorpyrifos exposure are permanent. Developmental Brain Res 2005;158:115-119.

Osborne Organics

March 20, 2019

Dear Chair Clem and House Agriculture and Land Use Committee members,

I will not be able to appear in person. I appreciate the opportunity to address HB 3058 and offer a statement of support.

Removing Clopyrifos from sale and use is overdue. There are alternative strategies in place for transition. Putting restrictions on Neonicotinoid pesticides and taking them out of the hands of the general public is a good step.

I have been a professional horticulturist for forty-five years. I have been involved in the organic industry for the past twenty years. I am conventionally trained and spent twenty-five years as a chemical applicator in nursery, greenhouse, and horticultural production. Twenty years ago, I shifted my focus from chemical intensive management to natural, organic strategies. At that time, I expanded my area of expertise to include turf and landscape management. In addition to my industry experience, I am an eighteen-year elected member and Chairman of the Town of Marblehead, MA Recreation and Park Commission.

I believe that there is enough science that exists to show that there are issues with many of the products that we routinely use where children and adults intersect with turf and the landscape. It is true that we will never be able to say that a specific product caused a specific disease, but we do know that science has shown that repeated exposures to low dose applications is problematic with developing children and many adults. The protocol of risk assessment based on LD 50 as established in FIFRA (Federal Insecticide, Fungicide and Rodenticide Act), is outdated in light of current research.

I believe that the use of synthetic fertilizers and pesticides puts one on a treadmill when managing the landscape. Generally speaking, the insects that we are targeting with Chlopyrifos and Neonicotinoid insecticides can be managed with alternative active ingredients. Insects are often not the problems in the landscape but rather they are the symptoms of underlying problems. We have been taught by an industry to repeatedly treat those symptoms as opposed to focusing on solving the problem. If we just use chemicals and do not employ other inputs or strategies to grow healthy plants, the insects will often return, and we will fall back on chemicals once again.

A chemical-free approach does not focus on a product swap. It is following this concept where many fail. There is a general lack of understanding that organic management is not just

11 Laurel Street Marblehead, MA 01945 781-631-2468

switching to organic products, but in reality it is learning how to manage the lawn, the garden, or any other area as a system. That system involves what we can see above ground and most importantly what we cannot see below ground. Once we learn to manage everything, particularly the microbial community in the soil that nature put in place, we move into the area of success in synthetic free management.

The use of pesticides does not acknowledge nor pay much attention to the biological component in the soil other than when a certain organism is functionally needed to release synthesized, slow release form of nitrogen or break down pesticide residuals. In an organic system, the biological life in the soil is central to nutrition management, some insect control, and much disease suppression.

Education is the key to making programs work. In addition to being a hands-on consultant that works with school districts, municipalities, corporate campuses, universities, and the federal government in developing organic transition programs for turf and the landscape, I instruct landscape contractors and municipal officials in the practical application strategies, products, and protocols of natural, organic management of turf and the landscape.

Because natural strategies do not just swap out product, rather than follow a traditional IPM Program, the organic industry follows a protocol referred to as Organic IPM. This protocol retains many of the same sound protocols as its predecessor, but it directly focuses on the system and restricts the use of materials to an allowed list. That list is extensive and when combined with the other concepts of a systems-based approach assists in the successfully transition of public and private areas. A copy of the Organic IPM protocol follows.

An example of a product that replaces Neonicotinoids for white grub control is GrubGone. This is a biorational insecticide whose active ingredient is Bt (bacillus thuringiensis) sp.galleraie. It is extremely effective when used within the appropriate application window.

There are now alternatives that can be employed as we learn to move beyond the traditionally more toxic materials that we have been using and currently use. The toxicity can be equally experienced from both human and environmental health perspectives.

Respectfully,

Chip Osborne, President
Osborne Organics

Organic IPM

Organic IPM is problem-solving strategy that prioritizes a natural, organic approach to turf and landscape management without the use of toxic pesticides. It mandates the use of natural, organic cultural practices that promote healthy soil and plant life as a preventative measure against the onset of turf and landscape pest problems.

The US EPA and CDC recommend the use of an Integrated Pest Management (IPM) program by local governments. IPM promotes the use of nonchemical methods for pest prevention and management, such as physical, mechanical, cultural, and biological controls. Least toxic pesticides maybe selected for pest control only after all other reasonable nonchemical methods have been exhausted. The use of even allowed pest control products should be used on a rescue basis as opposed to incorporation into routine management programs.

This approach will eliminate or significantly reduce the use of, and exposure to, pesticides in the management of lawn areas, playing fields, and landscapes. Furthermore, it will mitigate the potentially negative impact of landscape management on local waterways, air quality, and ecosystems.

This protocol will rely on a systems approach that integrates soil health and plant vigor with proper cultural practices. The goal is to put a series of preventative steps in place that can naturally attenuate pest issues before they become a significant concern. Careful monitoring for pests and the development of the threshold levels within this system will allow for easier control of pest problems, if they do arise. This protocol is knowledge-based utilizing an intimate understanding of soil dynamics, grass biology, and pest/disease morphology to establish the proper procedures for maximizing the health of the landscape. This protocol should mitigate most serious pest pressures.

When a pest has not been satisfactorily controlled by the above strategies, the rescue approach follows the path to the use of the least toxic pesticides. Recommendations are for the use of Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) section 25b minimum risk, pesticides listed by the US Environmental Protection Agency. Materials that are bio-rational in nature can also be used. Bio-rational pesticides are EPA registered. They have been approved by the Organic Materials Review Institute (OMRI) or an equivalent certifying body.

11 Laurel Street Marblehead, MA 01945 781-631-2468

Osborne Organics

Essential Organic Integrated Pest Management practices include, but are not limited to:

- Regular soil testing
- The addition of approved materials for soil fertility and amendment as necessitated by soil test results
- Selection of plantings using criteria of hardiness; suitability to native conditions; disease and pest resistance; and ease of maintenance
- Modification of outdoor management practices to comply with organic horticultural science, including scouting, monitoring, watering, mowing, pruning, proper spacing, and mulching
- The use of physical controls, including hand weeding and over seeding
- The use of biological controls, including the introduction of natural predators, and the enhancement of the environment of a pest's natural enemy
- Through observation, determining the most effective treatment time, based on past biology and other variables, such as weather and local conditions
- Eliminating pest habitats and conditions supportive of pest population increases

OREGON CHAPTER
OF THE WILDLIFE SOCIETY
PO Box 2378
Corvallis, OR 97339

March 26, 2019

FROM: The Oregon Chapter of The Wildlife Society

TO: House Committee on Agriculture and Land Use

SUBJECT: Support for HB 3058

Chair Clem, Vice Chairs McLain and Post and members of the committee,

The Oregon Chapter of the Wildlife Society is writing to express our strong support for HB 3058.

The Wildlife Society is an international organization founded in 1937, representing nearly 10,000 professionals, including scientists, managers, educators, technicians, planners, consultants, conservation officers, students and others who manage, conserve, and study wildlife populations and habitat. In Oregon, the Oregon Chapter of The Wildlife Society (ORTWS) represents nearly 500 such professionals from many areas of public and private enterprise.

Our mission is to promote wise conservation and management of wildlife resources in Oregon by serving and representing natural resource professionals. A central purpose of ORTWS is to support scientifically sound management policies.

Invertebrates are an essential component of a healthy functioning ecosystem. They pollinate our flowers and crops, they are a vital source of food for many other species, they control other 'pest' species, they eat decomposing and dead matter turning it into compost that helps nourish the soil, they aerate the soil and of course provide us with food (e.g. honey). The ecosystem services provided by invertebrates would equate to billions of dollars.

Unfortunately invertebrates are in decline globally, a recent global analysis found that 40% of pollinator species may be at risk of extinction (IPBES 2016). In Oregon we currently have four federally listed species, two of which are butterflies (Taylor's checkerspot and Oregon silverspot) that our members have been working to recover for over 25 years.

Pesticides are one cause of this decline and neonicotinoid represents an especially severe threat as its use is currently unregulated. They are systemic poisons that are absorbed into the plant and are present in the pollen and nectar, and they persist for long lengths of time in the soil.

In recognition of their potential harm to pollinators and other invertebrates the use of these chemicals in Europe has been strongly regulated since April 2018.

On behalf of ORTWS Members and Board, thank you for your time and consideration in this matter and please do not hesitate to contact us with questions or to engage further discussion.

Respectfully,

ORTWS Board of Directors

ORTWS Contact for HB 3058:
Chris Parta, ORTWS Legislative Liaison chris@partaoregon.com

Christine Perala Gardiner PhD
cp.gardiner@gmail.com PO Box 2451, Cave Junction Oregon 97523
www.SiskiyouAlpaca.com siskiyou.alpaca gmail.com

25 March 2019

Public Comment on HB 3058

Dear Chair Clem and Members of the House Agricultural and Land Use:

I'm writing as a small farmer in southern Oregon, extremely concerned about the "first-strike" use of highly toxic poisons to control "weeds" and "pests" in Oregon. Now that the lawsuits are mounting against pesticide manufacturers nationwide, now is an excellent time to steer Oregon toward protecting all Life in Oregon.

Now is the time to ban these horrendous, toxic chemicals that were designed for use in warfare. I ask the State of Oregon to lead our nation toward Pollinator Friendly Agriculture. Without bees, there is no future for any agriculture.

HB 3058 is a companion bill that would also ban the purchase, sale, and use of Chlorpyrifos. It also lists Neonicotinoids as Restricted Use Pesticides, thereby requiring certification and training before buying, selling, or disseminating this particularly highly toxic class of pesticides. The effect of removing Neonics from the shelves would be the same as above. This version does not contain any discussion of fees or costs.

I'm asking you to take proactive measures to end the tyranny of chemical trespass against every Oregonian: Republican, Democrat, human or other mammals, plants, insects, soil and water biota. We need a complete ban on these terrible chemicals designed to cause Biocide**.**

Thank you for taking this action in Oregon legislation to protect People, Wildlife and the Public Water Supply from these highly toxic pesticides, as your professional mandate directs.

Christine Perala Gardiner, PhD
Member, Beyond Toxics

NORTHWEST CENTER FOR ALTERNATIVES TO PESTICIDES

SHOP BEE-SAFE NURSERIES!

PRETTY ON THE OUTSIDE... POISON ON THE INSIDE:

Neonicotinoids, a class of pesticide extremely toxic to bees and other pollinators, are often used in the production of ornamental trees, shrubs, and flowers commonly purchased for home and business landscaping. The chemical, called a 'systemic,' moves throughout the entire plant, making pollen and nectar in flowers toxic.

RETAILERS SELLING NEONIC-FREE PLANTS

This list contains retailers who sell only neonic-free ornamental plants. Also included with a note are retailers who carry some neonic-free plants and identify them through signage or labeling, and retailers who offer at least two-thirds of their stock as neonic-free and can readily identify this stock to customers. NCAP determined nursery suitability for this list based on self-reported information obtained from nursery representatives. Surveys and interviews with nursery representatives were conducted between 2015-2017. NCAP has not independently verified the absence of neonicotinoids in plants from these nurseries via laboratory analysis.

Applegate Nursery	225 Powell Creek Road	Williams	OR	541-659-0183
Bosky Dell Natives	23311 SW Bosky Dell Ln	West Linn	OR	503-638-5945
Cornell Farm	8212 SW Barnes Rd	Portland	OR	503-292-9895
Cornell Farms grows 2/3 of the stock offered in the retail store, all of it neonic-free. Sells one product containing neonics in houseplants section.				
Dancing Oaks Nursery	17900 Priem Rd	Monmouth	OR	503-838-6058
Doak Creek Native Plant Nursery	83331 Jackson Marlow Rd	Eugene	OR	541-484-9206
Fern Hill Nursery & Botanical Sanctuary	78703 Echo Hollow Ln	Cottage Grove	OR	541-942-3118
Garden Fever!	3433 NE 24th Ave	Portland	OR	503-287-3200
Garden Fever! Identifies all the suppliers who grow neonic-free with informative signs in the shop and with a yellow Pollinator-Friendly plant tags.				
Garden Thyme Nursery	4177 Cascade Highway NE	Silverton	OR	503-551-187
Jockey Hill Nursery	33284 Hillcrest Dr	Scappoose	OR	503-543-2614
Naomi's Organic Farm Supply	2615 SE Schiller St	Portland	OR	503-517-8551
NatureLee Inspired	1142 Upper River Rd	Gold Hill	OR	541 324-8107
The Plant Connection	858 Neil Creek Road	Ashland	OR	541-482-6114
Plant Oregon	8677 Wagner Creek Rd	Talent	OR	541-535-3531
Schreiner's Iris Gardens	3625 Quinaby Rd NE	Salem	OR	503-393-3232
Schreiner's irises are neonic-free but they do use neonics on azaleas at their display gardens.				
Shooting Star Nursery	3223 Taylor Rd	Central Point	OR	541-840-6453
Skyline Nursery	24655 NW Dixie Mountain Rd	North Plains	OR	503-621-3434
Xera Plants	11220 SW Tonquin Rd	Sherwood	OR	503-612-9950

Please vote with your dollar by supporting these nurseries. If you know of other neonic-free nurseries, please tell us so we can expand our list!

WWW.PESTICIDE.ORG / INFO@PESTICIDE.ORG

Wholesalers Growing Only Neonic-Free Plants

These wholesalers do not use neonics on their plants. Choose these at your local retailer whenever you can. Tell your retailer you'd like to see them carrying more plants from these suppliers!

OREGON

Balance Restoration Nursery, LLC	Lorane	OR	find them on facebook	541-942-5530
Beaverlake Nursery	Beavercreek	OR	www.beaverlakenursery.com	503-632-4787
Blooming Advantage	Cornelius	OR	www.bloomingadvantage.com	503-357-2904
Bosky Dell Natives	West Linn	OR	www.boskydellnatives.com	503-638-5945
Cedarglen Floral Company	Damascus	OR	www.cedarglenfloral.com	503-658-3370
Champoeg Nursery	Aurora	OR	www.champoegnursery.com	503-678-6348
Dancing Oaks Nursery	Monmouth	OR	www.dancingoaks.com	503-838-6058
Doak Creek Native Plant Nursery	Eugene	OR	www.doakcreeknursery.com	541-484-9206
Fern Hill Nursery & Botanical Sanctuary	Cottage Grove	OR	www.fernhillnursery.com	541-942-3118
Heritage Seedlings, Inc.	Salem	OR	www.heritageseedlings.com	503-585-9835
Jockey Hill Nursery	Scappoose	OR	www.jockeyhill.com	503-543-2614
Log House Plants	Cottage Grove	OR	www.loghouseplants.com	541-942-2288
Northwoods Nursery	Molalla	OR	www.northwoodsnursery.us	503-651-3727
Scholls Valley Native Nursery, LLC	Tigard	OR	www.schollsvalley.com	503-624-1766
Schreiner's Iris Gardens	Salem	OR	www.schreinersgardens.com	503-393-3232
Seattle Native Plants	Burien	OR	www.seattlenativeplants.com	206-953-7313
Seven Oaks Native Nursery	Albany	OR	www.sevenoaksnativenursery.com	541-757-6520
Xera Plants	Sherwood	OR	www.xeraplants.com	503-612-9950

WASHINGTON

Amro Nurseries	Shelton	WA		360-490-0466
Fir Run Nursery	Orting	WA	www.firrunnursery.com	253-229-7952
Green City, Inc	Rention	WA		425-228-6488
Lawyer Nursery, Inc.	Olympia	WA	www.lawyernursery.com	800-551-9875
Lee Farm and Nursery	Fall City	WA	www.leefarmandnursery.com	
Perennial Pleasures	Bow	WA		360-766-6584
Robinwood Nursery	Vashon	WA	www.robinwoodnursery.com	206-463-5115
Skagit Gardents	Mt. Vernon	WA	www.skagitgardens.com	360-424-6144
WACD Plant Materials Center	Bow	WA	www.wacdpmc.org	360-757-1094
Wild Bird Bamboo	Friday Harbor	WA	www.wildbirdbamboo.com	360-378-2924
Windy Meadow Nursery	Ferndale	WA	www.coco-coir.com	360-384-5348
Woodbrook Native Plant Nursery	Gig Harbor	WA	www.woodbrooknativeplantnursery.com	253-857-6808

The Precautionary Principle in Environmental Science

David Kriebel,[1] Joel Tickner,[1] Paul Epstein,[2] John Lemons,[3] Richard Levins,[4] Edward L. Loechler,[5] Margaret Quinn,[1] Ruthann Rudel,[6] Ted Schettler,[7] and Michael Stoto[8]

[1]Lowell Center for Sustainable Production, Department of Work Environment, University of Massachusetts-Lowell, Lowell, Massachusetts, USA; [2]Center for Health and the Global Environment, Harvard University Medical School, Boston, Massachusetts, USA; [3]Department of Life Sciences, University of New England, Biddeford, Maine, USA; [4]Department of Population and International Health, Harvard University School of Public Health, Boston, Massachusetts, USA; [5]Department of Biology, Boston University, Boston, Massachusetts, USA; [6]Silent Spring Institute, Newton, Massachusetts, USA; [7]Science and Environmental Health Network, Boston, Massachusetts, USA; [8]Department of Biostatistics, George Washington University School of Medicine, Washington, D.C., USA

Environmental scientists play a key role in society's responses to environmental problems, and many of the studies they perform are intended ultimately to affect policy. The precautionary principle, proposed as a new guideline in environmental decision making, has four central components: taking preventive action in the face of uncertainty; shifting the burden of proof to the proponents of an activity; exploring a wide range of alternatives to possibly harmful actions; and increasing public participation in decision making. In this paper we examine the implications of the precautionary principle for environmental scientists, whose work often involves studying highly complex, poorly understood systems, while at the same time facing conflicting pressures from those who seek to balance economic growth and environmental protection. In this complicated and contested terrain, it is useful to examine the methodologies of science and to consider ways that, without compromising integrity and objectivity, research can be more or less helpful to those who would act with precaution. We argue that a shift to more precautionary policies creates opportunities and challenges for scientists to think differently about the ways they conduct studies and communicate results. There is a complicated feedback relation between the discoveries of science and the setting of policy. While maintaining their objectivity and focus on understanding the world, environmental scientists should be aware of the policy uses of their work and of their social responsibility to do science that protects human health and the environment. The precautionary principle highlights this tight, challenging linkage between science and policy. *Key words:* environmental science, foresight, planning, precaution, risk assessment, science policy.

Environ Health Perspect 109:871–876 (2001). [Online 15 August 2001]
http://ehpnet1.niehs.nih.gov/docs/2001/109p871-876kriebel/abstract.html

There are few pressing social issues that depend as heavily on scientific information as do environmental problems. Most scientists and policy makers agree on the importance of science in environmental policy debates, even when they can agree on almost nothing else about the health of the ecosphere. Thus, environmental scientists play a key role in society's responses to environmental problems, and many of the studies performed by environmental scientists are intended ultimately to affect policy. The precautionary principle has been proposed as a new guideline in making environmental policy (*1*,*2*). In this paper we examine the implications of the precautionary principle for environmental scientists. Specific objectives are to define the precautionary principle and illustrate it through three brief examples; identify aspects of conventional science that may inhibit precautionary policies; identify new directions for scientific research that would better inform precautionary policies; and promote dialogue among environmental scientists about the usefulness and potential applications of the precautionary principle.

Definition of the Precautionary Principle

A 1998 consensus statement characterized the precautionary principle this way: "when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically" (*3*). The statement went on to list four central components of the principle: taking preventive action in the face of uncertainty; shifting the burden of proof to the proponents of an activity; exploring a wide range of alternatives to possibly harmful actions; and increasing public participation in decision making.

The term "precautionary principle" came into English as a translation of the German word *Vorsorgeprinzip*. An alternative translation might have been "foresight principle," which has the advantage of emphasizing anticipatory action—a positive, active idea rather than precaution, which to many sounds reactive and even negative. Although the principle has its roots in German environmental policy, over the past 20 years it has served as a central element in international environmental treaties addressing North Sea pollution, ozone-depleting chemicals, fisheries, climate change, and sustainable development (*3*). Precaution is one of the guiding principles of environmental laws in the European Union.

The Precautionary Principle in Practice

Historical Links

The precautionary principle encourages policies that protect human health and the environment in the face of uncertain risks. In this broad sense it is not a new concept, and some may object to giving it a new name, when similar ideas go by different names in other disciplines. For example, public health practitioners use the term primary prevention to mean much the same thing. The physician's obligation to first do no harm is a precautionary approach to treating a sick person. The governments of several Scandinavian countries have made regulatory decisions about electromagnetic fields and other hazards using a concept called prudent avoidance, which is also similar (*4*,*5*). The term precautionary principle has the advantage that it provides an overarching framework that links environmental sciences and public health.

Motivating Factors

The precautionary principle has arisen because of the perception that the pace of efforts to combat problems such as climate change, ecosystem degradation, and resource depletion is too slow and that environmental and health problems continue to grow more rapidly than society's ability to identify and correct them. In addition, the potential for catastrophic effects on global ecologic systems has weakened confidence in the abilities of environmental science and policy to identify and control hazards. There are also the apparent contradictions of our regulatory process: if the laws governing toxic chemical

Address correspondence to D. Kriebel, Lowell Center for Sustainable Production, University of Massachusetts Lowell, 1 University Avenue, Lowell, MA 01854 USA. Telephone: (978) 934-3250. Fax: (978) 452-5711. E-mail: David_Kriebel@uml.edu

We thank C. Crumbley for her assistance with this project.

This work was supported in part by grants from the John Merck Fund, the Jessie B. Cox Charitable Trust, the New York Community Trust, the V. Kann Rasmussen Foundation, and the Mitchell Kapor Foundation.

Received 12 February 2001; accepted 28 February 2001.

release are effective, then why are mercury levels in freshwater fish so high that pregnant women should not eat them (*6,7*)? How is it possible that human breast milk may not meet U.S. Food and Drug Administration contaminant limits for baby food (*8,9*)?

The great complexity, uncertainty, and potential for catastrophe from global climate change are among the strongest motivators for those urging precaution in environmental policy. The earth warmed over the twentieth century by an estimated 0.6°C (*10*). The trend was not uniform, though, and warming is occurring faster during the winter and at night (*11*), and the winter warming is occurring faster at high latitudes than near the tropics (*12*). For human populations, the rates of change and wide swings in weather are of chief concern, as ice core records indicate that increased climatic variability may be associated with rapid climate change events and changes in the ocean thermohaline circulation (*13*). Together, warming and more extreme weather have begun to alter marine life and the weather patterns that affect infectious diseases, their vectors, and hosts. The unprecedented scale of this hazard justifies reexamination of environmental monitoring systems and paradigms (*14*).

Frustration with policy concerning toxic chemicals has also stimulated interest in the precautionary principle. The risk assessment process is perceived by a growing segment of the population as antagonistic to strong environmental protection and as excessively complex and full of hidden assumptions that have the effect of disenfranchising all but the experts from the decision-making process. Current U.S. environmental policy often seems to be more reactionary than precautionary, requiring a high degree of certainty of harm before preventive action is taken, and emphasizing the management of risks rather than their prevention. The precautionary principle, by calling for preventive action even when there is uncertainty, by placing the onus on those who create the hazard, and by emphasizing alternatives and democracy, is viewed by environmentalists as a way to shift the terms of the debate and stimulate change.

Points of opposition. A lively debate is now underway about the usefulness of the precautionary principle (*15–20*). Perhaps the most frequently voiced criticisms are *a*) current regulatory procedures are already precautionary; for example, the safety factors used in risk assessments insure precaution; *b*) the precautionary principle is not scientifically sound because it advocates making decisions without adequate scientific justification; and *c*) if it were implemented, the precautionary principle would stifle innovation by requiring proof of safety before new technologies could be introduced. Each of these concerns has been addressed by proponents of the principle (*21–23*), and this article is not intended as a comprehensive response to critics. The objective instead is to discuss the implications of the precautionary principle for the work of environmental scientists.

Case Illustrations

Cellular telephones in airplanes. When the flight attendant explains the safety procedures before takeoff, there is an instruction not to use various electronic devices during takeoff and landing and not to use cellular telephones any time during flight. There is some very limited (anecdotal) evidence that these devices may interfere with the essential navigational and control systems of the aircraft. In 1999, in response to inquiries about the necessity of this ban, the U.S. Federal Aviation Administration (FAA) commissioned a study to gather stronger evidence for or against the hypothesis that consumer electronic devices interfere with aircraft functions (*24*). The study failed to find any evidence of this interference. Nevertheless, the FAA ruled that, in the absence of strong evidence of safety, the ban would continue in effect. Most people agree that the inconvenience of not being able to talk on the phone in flight is offset by even a small risk of an airplane crash. This illustrates the first component of the principle: taking action in the face of uncertainty. The second aspect of precaution deals with burdens of proof, and here, too, there would probably be little controversy. Most would agree that those who would change the rule on cellular telephone use in flight should have the responsibility to show that the change will not cause unreasonable risk. But suppose concerns about portable electronic devices in airplanes had not been raised initially, and so airline passengers were currently using their cellular telephones in flight. Now suppose that a few isolated malfunctions occurred in the navigational systems of a small number of aircraft while cellular telephones were in use, and concerns were raised. Should cell phone use be banned? At that point there would be a quantifiable economic loss from ending the practice. It seems quite likely that implicitly or explicitly a cost–benefit analysis would be run, and to do this, it would be necessary to estimate the risk—something that would be, and is, very hard to do with any confidence. Some might call this approach more "science based," but it would be a highly uncertain process, and one in which the risks being evaluated might be very small, but the consequences potentially catastrophic. Fortunately, the way events have actually unfolded, it is not necessary to estimate the risk—precautionary action was taken. The availability of an economically viable alternative (in-flight telephones) may have made it easier to act in the absence of strong evidence, which highlights the potential for the precautionary principle to stimulate the search for safer technologies.

Pesticides in schools. Recently the Los Angeles Unified School District, the largest public school system in the United States, announced a new policy on the use of pesticides in schools (*25*). The policy states unambiguously that pesticides pose risks to the health of children and the environment, that they shall be used only after nonchemical methods have been considered, and that if there is a choice among pest control methods, the least harmful one shall be chosen. There is no mention of balancing risks and benefits, nor a list of banned substances. The precautionary principle is a long-term objective of the policy, according to its authors. Critics worry that the precautionary principle will encourage technology choices based on fear and emotions, rather than on science. But another interpretation would be that the Los Angeles Unified School District is saying that all pesticides should be assumed to be hazardous, while acknowledging a great deal of uncertainty about exactly how hazardous. The intention to prefer nonchemical methods and to choose the least toxic method encourages a search for alternatives, while at the same time not preventing the use of a toxic chemical if it is found to be necessary and irreplaceable. The new policy also requires consideration of the service or function that a pesticide provides. For example, a pesticide being used for aesthetic purposes may be determined to be less important than one that serves a hygienic function. The former may be more readily eliminated than the latter, if no alternative can be found.

Polyvinyl chloride toys. Polyvinyl chloride (PVC) is an extremely versatile material, made into thousands of products. By adding varying amounts of a chemical called a plasticizer, the pliability of PVC can be modified from hard and brittle to soft and almost spongy. There is evidence that several of the plasticizers, members of the phthalate chemical family, are reproductive toxicants in animals. They may also cause reproductive toxicity in humans, although this evidence is quite limited (*26–28*). Until 1999, many PVC plastic toys specifically designed to be sucked and chewed contained the plasticizer diisononyl phthalate. Many of the manufacturers of toys that formerly contained this chemical have now voluntarily stopped using this plasticizer, or in some instances completely phased out PVC in these toys, in response to consumer and government concerns about toy safety. But the evidence for human health risks is weak and uncertain. Producers of PVC products have argued that there is no evidence of harm from use of their products, given 40 years of use without apparent ill effects.

There is a flaw in this reasoning, however, because the absence of evidence of harm is not the same thing as evidence of the absence of harm. Of course, absolute safety can never be proven. But a lengthy and costly risk assessment, followed by an equally lengthy and acrimonious risk management process would be the likely outcome of the present one-substance-at-a-time approach to chemicals policy.

The precautionary principle seeks to minimize the limitations of a risk assessment-based regulatory policy by encouraging a search for alternatives whenever a potentially hazardous chemical is identified. If a clearly safer alternative exists, why accept even a small, highly uncertain risk? The Danish Environment Agency used just this logic in taking action to eliminate phthalates from toys (*29*). They said, in essence, that there is exposure to these compounds, there is animal toxicity data, the exposure is to children who by definition are particularly susceptible to many toxic substances, there are alternatives, and the product serves no necessary function. Considering all these factors, they concluded that the plasticizer should not be used in toys.

Limitations of Conventional Scientific Methods

Environmental scientists study highly complex, poorly understood systems. Often the most informative experiments cannot be conducted for logistical or ethical reasons (there is only one Atlantic Ocean to study; potential carcinogens cannot be administered to humans in double-blind trials). At the same time, this work is of great interest to those who seek to balance economic growth and environmental protection. In this complicated and contested terrain, it is useful to examine the methodologies of science and to consider ways that, without compromising integrity and objectivity, research can be more or less helpful to those who would act with precaution. It would, for example, be useful to policy makers if scientists were more explicit about the limits of knowledge and about the nature and amount of uncertainty in research findings.

Presented below are examples of the ways that science is currently conducted that may make it more difficult to set precautionary policies. There may be alternatives to these methods, well within the bounds of good practice, that would be more helpful to policy makers faced with high-stakes decisions and great scientific uncertainty.

Hypothesis Formulation

Einstein said that the theory decides what can be observed, and at the more practical level, the formulation of specific research hypotheses determines to a large degree the sorts of results that can be found. Where does the particular formulation of a hypothesis come from? Often the hypothesis is formulated in a way that is feasible to test with the time and resources available. There is also a tendency for researchers to refine understanding of old problems rather than risk investigating new ones (*30*). Greater and greater levels of detail are sought about well-defined problems, rather than the higher stakes enterprise of searching for entirely new phenomena. For example, we refine understanding of the mechanisms of toxicity of asbestos, lead, and polychlorinated biphenyls, rather than evaluating effects of other, less well-studied toxicants. Funding agencies and skeptical peer reviewers reinforce this tendency by favoring tightly focused proposals that repeat or incrementally build upon work in well-established areas.

Emphasis on Independent Effects, Not Interactions

There is a tendency to assume that the mechanisms underlying the phenomena being studied are driven primarily by the independent actions of a few causal factors. If they interact, this is assumed to be of secondary importance. This implicitly assumes that things are not connected and leads to an atomized worldview. In reality, complex biological systems such as ecosystems, human populations, or individual physiology are composed of feedback loops and other interactions which make cause–effect relationships far from direct or linear. But many times the effects of hypothesized causal factors are considered in research to be decomposable into additive components that are measured individually. For example, when studying a mixture of pollutants, the emphasis is on identifying which component of the mixture is problematic. Interactions are difficult to study, but this should be seen as a challenge to develop more sensitive and complex methods, rather than as an inherent limitation of science.

Narrow Definition of Uncertainty

The formal evaluation of error or uncertainty in many environmental science papers is limited to a presentation of *p*-values or confidence intervals for the main results. Beyond this, there may be a qualitative examination of limitations of the findings, which is relegated to the discussion section at the end of the paper. The standard *p*-values and confidence intervals indicate the magnitude of potential error in the statistical parameter estimates due strictly to sampling variability. But in observational studies of complex, poorly understood systems, this may be the least important source of uncertainty. Potentially more important are errors in the independent variables, errors arising from choice of the wrong form for the model(s) used to analyze and interpret the data, and biases from problems in the conduct of the study.

For example, a study of the effects of an environmental contaminant on reproductive success in fish would typically report the amount of sampling error around the final estimate of the degree of association found between the contaminant and the measure of reproductive behavior. But this would typically not take into consideration the error in measuring the levels of the contaminant in the fish or in the environment and would not investigate the sensitivity of the findings to the choice of statistical models used to link exposure with reproductive outcome.

It is sometimes argued that scientists are trained to read papers critically and that they are able to factor in these other sources of uncertainty in their evaluation of a study. But applied scientists are also communicating to nonscientists who may mistakenly take the limited characterization of sampling error as the best estimate of all the uncertainty.

Setting Type I and Type II Error Rates

Errors due to sampling variability are routinely quantified. However, standard practice has led to a conservatism that perhaps hinders precautionary action. When a scientific investigation is designed to test a hypothesis, there are two kinds of errors that one seeks to minimize. A Type I error is the mistake of concluding that a phenomenon or association exists when in truth it does not. (Technically, the Type I error is rejecting the null hypothesis when it is really true. The paraphrasing above, while valiantly railed against by statistics teachers everywhere, is the way it is thought of in everyday practice.) By convention, Type I (or alpha) errors are guarded against by setting that error rate low, usually at 5%. In other words, the finding must be so strong that there is less than a 5% probability that this result would have been seen by chance alone in a world in which no such phenomenon actually exists. In this case the result is called statistically significant (with the clear implication that one is supposed to believe it). The Type II error, failing to detect something that actually does exist, is, by convention, often set at 20% (although practical limitations of sample size often result in a substantially higher or lower Type II error). Twenty percent of the time, a real phenomenon will be missed because the data were not strong enough to convincingly demonstrate its existence. There is an implicit bias here: the test is set up to be more cautious about falsely detecting something than about failing to detect something. Should Type I and Type

II error rates be set explicitly and *a priori*, depending on the purposes that the study is meant to serve? Bayesian statistical methods promise a way out of these conundrums by shifting the focus from formal testing to calculating the weight of evidence provided by a particular study and the degree to which this study should shift *a priori* beliefs. At present, Bayesian methods are little used in practice, but research to make them more accessible and practical is now under way (*31–33*).

Type III Errors

A Type III error occurs when one provides an accurate answer to the wrong problem (*34*). The cliche about looking under the street light for the keys lost down the block (because the light is better there) comes to mind to illustrate this common problem. To some degree, this is another aspect of hypothesis formulation discussed above. Citizen groups who ask a scientist for help with a particular environmental concern frequently experience the consequence of Type III errors. The citizens have a broad concern about, for example, potential health effects of a power plant in the neighborhood. The scientist hears the concern, and translates it into a problem that he or she is able to solve with the tools at hand, such as, do the power plant emissions exceed current health standards? This translation almost inevitably narrows the focus to something manageable and solvable. But often the citizens are frustrated with the results because scientitsts did not adequately address the initial concerns. On the other hand, the scientist is puzzled or, worse, concludes that the citizens are "antiscience."

Disciplinary Divisions

The citizens group's concerns about the power plant would probably be better addressed by an interdisciplinary investigation, using a wide variety of different methods and looking for an integrated understanding of the facility's impacts. Traditional boundaries between academic disciplines make it difficult to bring together the broadest possible set of research tools; combining for example quantitative and qualitative methods.

Scientific Methods to Inform Precautionary Policy

As noted at the beginning of this paper, science plays a critical role in environmental policy by providing insights into the normal functioning of natural systems and the ways they are disrupted by technologies and other human activities. Environmental scientists use a wide variety of methods, and these are to a large degree determined by the problem at hand. In some fields, prediction is an essential part of scientific proof. In others, it is useless or impractical. The simple accumulation of confirming cases is of no use in fields that hold to a high standard of mathematical proof, and in some disciplines controlled experiments are essential. But in many environmental sciences where observational studies are the rule, experiments are often infeasible or unethical, and it is impractical to wait to see if predictions are borne out. Other types of evidence are used, and usually sufficient proof for action comes from the accumulation of plausible inference from independent lines of work. For instance, environmental causes of cancer may be identified from the geographic distributions of cancers; time trends in cancer frequency; the occurrence of cancers in highly exposed working populations; animal experiments; and experimental knowledge of chemical pathways of cancer induction. And once it is demonstrated that a particular molecule is carcinogenic, similar molecules are at least suspect. Any one line of argument is imperfect, and fault can be found with the details of most separate methods. It is the preponderance of evidence that finally prevails. It is never easy to determine the moment in this process when there is sufficient evidence to act as if a causal connection exists, but scientists can and should play an important role in this decision, as they are the ones who know the data and the methods best.

A shift to more precautionary policies creates opportunities and challenges for scientists to think differently about the way they conduct studies and communicate results. The following paragraphs briefly summarize some of the positive implications that such a policy shift might have for the conduct of science.

What Is Studied

There is a great need for better methods to study whole systems and the interactions of various causal factors. The cumulative and interactive effects of multiple insults on an organism or ecosystem are very difficult to study. There are often many levels of a system (individuals, families, communities, nations), and hazards often exert effects at multiple levels. Current methods in many disciplines are not well suited to such investigations.

As noted above, multidisciplinary teams will be more likely to find new ways to frame hypotheses that lead to insights not possible from narrow disciplinary viewpoints. The recent recognition of the problem of endocrine disruption provides an example. A review of many different types of evidence on the effects of persistent pollutants on wildlife in the Great Lakes led to the hypothesis that a common mechanism of action might be causing a variety of reproductive and developmental effects (*35,36*). Because of the fragmentation of scientific disciplines, no single researcher was able to develop a coherent hypothesis. An interdisciplinary conference (*35*) provided the opportunity for many different fields to meet and share insights. The conference organizers summarized the outcome (*35*):

> so shocking was this revelation [about the widespread observation of endocrine disruption in wildlife] that no scientist could have expressed the idea using only the data from his or her discipline alone without losing the respect of his or her peers.

Research Methods

Uncertainty is a positive aspect of knowledge because it clarifies what is known and unknown and thus stimulates further investigation. But there is also a strong desire on the part of scientists to be precise. This may result from a confusion of uncertainty of information with quality of information; but the two concepts are distinct (*37*). It is possible to produce high-quality information about greatly uncertain phenomena. Most scientists are aware that their *p*-values and confidence intervals do not fully capture all of the likely error in their results, but standard methods do not exist for characterizing other aspects of uncertainty. There is a great need for research to find ways to characterize, express, and communicate uncertainty. Scientists develop intuition or professional judgment about the strength of a particular result. The Bayesian view of statistical inference, an increasingly popular alternative to standard frequentist methods, acknowledges that we have beliefs about the phenomena under study and seeks to formalize the role these play in the way we view our data (*32*). The role of data, according to this perspective, is to shift our *a priori* beliefs about the phenomena under study. Strong results may shift beliefs a lot, producing a posterior probability that may be far from the prior probability that the researcher had assigned to the hypothesis before conducting the research. But weak data will have little impact, leaving posteriors close to priors. There is increasing awareness that Bayesian statistical methods correspond more closely to common approaches to logical inference in everyday life. Methods development work is still needed in most fields, however, before Bayesian statistics can be routinely applied.

Uncertainties that derive from the choice of research methods and mathematical models should also be more fully investigated and discussed. Formal sensitivity analyses in which the investigator assesses the degree to which results are changed by using different assumptions or analytic methods should become standard practice (*38*).

Current methods seldom encourage a search for patterns within noisy data and "clusters of clusters" of similar effects in different species. Conservation medicine is a new academic initiative that links human and animal health with ecosystem health and global change (*39*). It begins from the premise that the health of ecosystems is directly related to the health of species, including humans. The initiative arose from a growing understanding that human impacts on ecosystems were multiple and integrated. Conservation medicine uses interdisciplinary teams of veterinary and medical health professionals to develop a greater understanding of the ecological context of health and advance biodiversity conservation and ecosystem health.

If society chooses to act with incomplete information, it must be acknowledged that one kind of risk is being accepted to avoid another. One risk being accepted is that the policy choice may have been wrong. Fortunately, the effects of a policy can often be evaluated for beneficial or detrimental unintended consequences. Thus a strong environmental monitoring program and formal evaluations of the interventions or controls are essential parts of a policy of precaution (*40*).

Despite the need for more and better systems research, it remains true that much useful information is learned by taking a system apart and testing its components. The development of new approaches should supplement current scientific methods, not replace them. There is also an important role for those who can synthesize the results of the work of many disparate disciplines to reach insights not possible by the individual researchers. This has been called “joining edge” research (as opposed to “cutting edge”).

Conclusions and Recommendations

It is important to clearly distinguish between the development of scientific information about an issue and the setting of policy, but in practice, there is not always an unambiguous demarcation. Policy makers set agendas that determine the questions asked of scientists; scientists formulate hypotheses in ways limited by their tools and their imaginations; thus, the information they provide to the policy makers is limited and to a degree socially determined. There is a complicated feedback relation between the discoveries of science and the setting of policy. While maintaining their objectivity and focus on understanding the world, environmental scientists should be aware of the policy uses of their work and of their social responsibility to do science that protects human health and the environment (*14*). The precautionary principle highlights this tight, problematic linkage between science and policy, which can be summarized in the following seven points:

1. Scientific studies can tell us something about the costs, risks, and benefits of a proposed action, but there will always be value judgments that require political decisions.
2. The scientific data used for making policy will nearly always be limited by uncertainty. Even the best theory and data will leave much that is not known about estimates of risks, benefits, or costs.
3. In conducting their research, scientists must make assumptions, choices, and inferences based on professional judgment and standard practices, that if not known by the public or policy makers, may make scientific results appear to be more certain and less value laden than is warranted.
4. Although there are some situations in which risks clearly exceed benefits no matter whose values are being considered, there is usually a large gray area in which science alone cannot (and should not) be used to decide policy.
5. In these gray areas, status quo activities that potentially threaten human and environmental health are often allowed to continue because the norms of traditional science demand high confidence in order to reject null hypotheses, and so detect harmful effects.
6. This scientific conservatism is often interpreted as favoring the promoters of a potentially harmful technology or activity when the science does not produce overwhelming evidence of harm.
7. The precautionary principle, then, is meant to ensure that the public good is represented in all decisions made under scientific uncertainty. When there is substantial scientific uncertainty about the risks and benefits of a proposed activity, policy decisions should be made in a way that errs on the side of caution with respect to the environment and the health of the public.

References and Notes

1. O’Riordan T, Cameron J, eds. Interpreting the Precautionary Principle. London:Earthscan, 1994.
2. Freestone D, Hey E, eds. The Precautionary Principle and International Law. Boston:Kluwer Law International, 1996.
3. Raffensperger C, Tickner J, eds. Protecting Public Health and the Environment: Implementing the Precautionary Principle. Washington, DC:Island Press, 1999.
4. WHO. Electromagnetic Fields and Public Health Cautionary Policies. Geneva:World Health Organization. Available: http://www.who.int/peh-emf/publications/facts_press/EMF-Precaution.htm [cited 5 July 2001].
5. Aasen S, Johnsson A, Bratlid D, Christensen T. Fifty-Hertz magnetic field exposures of premature infants in a neonatal intensive care unit. Biol Neonate 70:249–264 (1996).
6. U.S. EPA. Mercury Study Report to Congress. EPA 452/R-97-003. Washington, DC:U.S. Environmental Protection Agency, 1997.
7. Schettler T. In Harm’s Way: Toxic Threats to Child Development. Boston:Greater Boston Physicians for Social Responsibility, 1997.
8. Abadin HG, Hibbs BF, Pohl HR. Breast-feeding exposure of infants to cadmium, lead and mercury: a public health viewpoint. Toxicol Ind Health 13:495–517 (1997).
9. Pohl HR, Hibbs BF. Breast-feeding exposure of infants to environmental contaminants—a public health risk assessment viewpoint: chlorinated dibenzodioxins and chlorinated debenzofurans. Toxicol Ind Health 12:593–611 (1996).
10. Albritton D, Allen M, Baede A, Church JA, Cubasch U, Xiaosu D, Yihui D, Ehhalt DH, Folland CK, Giorgi F, et al. Summary for Policymakers: A Report of Working Group 1 of the Intergovernmental Panel on Climate Change. Geneva:Intergovernmental Panel on Climate Change, 2001. Available: http://www.ipcc.ch/pub/spm22-01.pdf [cited 19 July 2001].
11. Easterling DR, Horton B, Jones PD, Peterson TC, Karl TR, Parker DE, Salinger MJ, Razuvayev V, Plummer N, Jamason P, Folland CK. Maximum and minimum temperature trends for the globe. Science 277:363–367 (1997).
12. Intergovernmental Panel on Climate Change. Climate Change ‘95: The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report of the IPCC. (Houghton JT, Meiro Filho LG, Callander BA, Harris N, Kattenberg A, Maskell K, eds). Cambridge:Cambridge University Press, 1996.
13. Paul Meyewski. Personal communication.
14. Lubchenco J. Entering the century of the environment: a new social contract for science. Science 279:491–497 (1998).
15. Bishop W. Risk assessment vs. the precautionary principle: is it really either/or? Risk Policy Report (20 March):35–38 (2000).
16. CEC. Communication from the Commission on the Precautionary Principle. COM(2000) 1. Brussels: Commission of the European Community, 2000.
17. Holm S, Harris J. Precautionary principle stifles discovery [Letter]. Nature 400:398 (1999).
18. Stirling A. On Science and Precaution in the Management of Technological Risk. EUR 19056 EN. Sevilla, Spain:European Commission Institute for Prospective Technological Studies, 2000. Available: http://www.jrc.es/cfapp/reports/details.cfm?ID=289 [cited 2 July 2001].
19. Danish Environmental Protection Agency. The Precautionary Principle: Extracts and Summary from the Danish Environmental Protection Agency’s Conference on the Precautionary Principle. Environment News No. 35. Copenhagen:Danish Environmental Protection Agency, 1998.
20. Applegate J. The precautionary preference: an American perspective on the precautionary principle. Hum Ecol Risk Assess 6:413–443 (2000).
21. Wynne B, Mayer S. How science fails the environment. New Scientist 138:33–35 (1993).
22. Ashford N. A conceptual framework for the use of the precautionary principle in law. In: Protecting Public Health and the Environment: Implementing the Precautionary Principle (Raffensperger C, Tickner J, eds). Washington, DC:Island Press, 1999;198–206.
23. Myers N. Debating the Precautionary Principle. Windsor, ND:Science and Environmental Health Network, 2000. Available: http://www.sehn.org/ppdebate.html [cited 2 July 2001].
24. Portable Electronic Devices: Hearings before the U.S. House of Representatives Committee on Transportation and Infrastructure, Subcommittee on Aviation, 106th Congress, 2nd Session, 20 July 2000, (statement of Captain P. McCarthy, T.E. McSweeny, and D.S. Watrous).
25. Preferring the Least Harmful Way. Rachel’s Environment and Health Weekly 684 (2000). Available: http://www.rachel.org/bulletin/index.cfm?issue_ID=1687 [cited 3 July 2001].
26. NTP-CERHR. NTP-CERHR Expert Panel Report on Di(2-ethylhexyl)phthalate. NTP-CERHR-DEHP-00. Research Triangle Park, NC:National Toxicology Program, Center for the Evaluation of Risks to Human Reproduction, 2000. Available: http://cerhr.niehs.nih.gov/news/DEHP-final.pdf [cited 19 July 2001].
27. European Scientific Committee on Toxicity, Ecotoxicity, and the Environment. Opinion on Phthalate Migration from Soft PVC Toys and Childcare Articles. Available: http://europa.eu.int/comm/food/fs/sc/sct/out19_en.html [cited 3 July 2001].
28. Tickner J, Schettler T, Guidotti T, McCally M, Rossi M. Health risks posed by the use of di-2-ethylhexyl phthalate in PVC medical devices: a critical review. Am J Ind Med 39:100–111 (2001).

29. Seedorf L. Personal communication.
30. Kuller L. Invited commentary: circular epidemiology. Am J Epidemiol 150:897–903 (1999).
31. Malakoff D. Bayes offers a new way to make sense of numbers. Science 286:1460–1464 (1999).
32. Carlin B, Louis T. Bayes and Empirical Bayes Methods for Data Analysis. New York:Chapman and Hall, 1996.
33. Greenland S, Poole C. Empirical Bayes and semi-Bayes approaches to occupational and environmental hazard surveillance. Arch Environ Health 49:9–16 (1994).
34. Schwartz S, Carpenter K. The right answer for the wrong question: consequences of type III error for public health research. Am J Public Health 89:1175–1180 (1999).
35. Colborn T, Clement C, eds. Chemically-Induced Alterations in Sexual and Functional Development: The Wildlife/Human Connection. Princeton, NJ:Princeton Scientific Publishing Co., 1992.
36. Krimsky S. Hormonal Chaos. Baltimore, MD:Johns Hopkins University Press, 1999.
37. Funtowicz S, Ravetz J. Uncertainty and Quality in Science for Policy. Dordrecht, Netherlands:Kluwer Academic,1990.
38. Greenland S. Basic methods for sensitivity analysis of biases. Int J Epidemiol 25:1107–1116 (1996).
39. Tufts Center for Conservation Medicine. Introducing the Center for Conservation Medicine. North Grafton, MA: Tufts University Veterinary School, 1999. Available: http://www.tufts.edu/vet/ccm/introtccm.html [cited 3 July 2001].
40. Goldstein B. The precautionary principle and scientific research are not antithetical [Editorial]. Environ Health Perspect 107:A594–595 (1999).

"The Voice of Oregon's Wheat Producers Since 1926"

OREGON WHEAT GROWERS LEAGUE
115 SE 8th Street · Pendleton, OR 97801 · 541.276.7330 · www.owgl.org

TO: **Rep. Brian Clem, Chair, Committee on Agriculture and Land Use**
Members of the Committee

FR: **Clint Carlson**
Wheat Farmer, Ione
Vice President, Oregon Wheat Growers League

RE: **Urge Your 'NO' Vote on HB 3058**

The word "tool" is a noun and defined as "an instrument (as a saw, file, knife, or wrench) used or worked by hand or machine to perform a task".

As citizens you use tools every day. You drive a car to the grocery store. You pay for your groceries with cash. You store them in a refrigerator.

As farmers we have tools also, wrenches, welders, pickup trucks, tractors, and chemicals.

The chemical part is what I'm here to talk about. You use chemicals in your everyday life. You use soap to clean your body, house and cars. Doctors prescribe antibiotics to heal you when you get sick. You use petro chemicals to fuel your car or other chemicals to power the battery in your electric car. These are tools we all use from our toolboxes every day.

Wheat growers use a class of crop protection chemicals called neonicotinoids. They have been developed to manage destructive insect pests. We use this as a seed treatment to deter wire worms and aphids from damaging our young wheat plants after planting the wheat seeds in the ground. The wire worm, without these products, will chew on the plant and either damage or kill it. This also leads to possible infection from soil borne pathogens entering the wound. The neonicotinoid treatment also protects the young plant from attack by aphids that carry the barley yellow dwarf virus.

Neonics are the only chemical that is labeled for wire worm control at this time, which means that without this product, my crop could be wiped out – devastating an entire years' worth of work and harvest. The chemical is applied to the seed and then placed in the soil. I think this is an important point; there will be no effect on pollinators because the seed is placed in the soil. Wheat is pollinated by the wind; no pollinators are involved in the wheat reproduction cycle.

It is my opinion that a "restricted use" label should not be applied to the neonicotinoids class of pesticides and I urge your NO vote on HB 3058.

WDC, 7 Nelson Street, Plymouth, MA, 02360
T +(508) 746-2522 F +(508)746-2537 E contact@whales.org W whales.org
WDC is a registered 501(c)3 non-profit organization.

House Committee on Agriculture and Land Use
Oregon State Legislature
900 Court St NE
Salem, OR 97301

March 26, 2019

Chair: Representative Brian Clem
Vice-Chairs: Representative Susan McClain, Representative Bill Post
Members: Representative Shelly Boshart Davis, Representative Ken Helm, Representative David Brock Smith, Representative Anna Williams

Dear Chair Clem, Vice-Chair McClain, Vice-Chair Post, and Committee members:

Whale and Dolphin Conservation (WDC) is the leading global charity dedicated to the conservation and protection of whales, dolphins, and their habitats. As the Jessica Rekos Fellow for Orca Conservation, my work focuses on the protection and recovery of the critically endangered Southern Resident orca population, a unique community of orcas that lives in the transboundary waters of the U.S. and Canada, and off the coasts of Washington, California, and Oregon. Based in Newport, Oregon, I also work to ensure our coastal waters are safe, protected, and free from threats for the many species of marine mammals who live off the Oregon Coast.

Today I am writing in support of HB 3058, which includes a provision to prohibit the sale, purchase, or use of the pesticide *chlorpyrifos* in Oregon. This pesticide is not only dangerous for humans, but is also listed by the National Pesticide Information Center as “highly toxic” to fish and aquatic invertebrates, the base of the food web in the Pacific Northwest, and is considered to have a significant adverse impact on salmon, a key food source for Southern Resident orcas.

This unique population of orcas has been listed as endangered under the U.S. Endangered Species Act (ESA) since 2005 and Canada’s Species At Risk Act (SARA) since 2003[1]. Genetically distinct from all other orca populations, the Southern Residents do not interbreed and rarely interact with other orcas, and is the only ESA-listed orca population. They are part of the fish-obligate “Resident” ecotype of orcas, and rely almost exclusively on salmon as their primary source of food. They are the only Resident population to inhabit the California Current ecosystem and frequent the outer coasts of Washington, Oregon, and Northern California[2]. Despite the research and conservation efforts initiated after their ESA listing, the Southern Residents have continued to decline and now number just 75 individuals, their lowest population abundance in 30 years[3]. The National Marine Fisheries Service (NMFS) has recognized them as one of eight marine species most at risk of extinction, and considers them a recovery priority #1: “a species whose extinction is almost certain in the immediate future because of a rapid population decline or habitat destruction.”[4]

The top threats to the survival and recovery of Southern Resident orcas have been identified as prey depletion – particularly of their primary prey, Chinook salmon – toxic contamination, vessel effects, and increasing levels of ocean noise[5]. These orcas have survived on the Pacific Northwest’s abundant salmon for millennia, but as salmon have declined throughout the region, the orcas have suffered from a lack of available prey. Without adequate resources of food in their habitat, the Southern Residents are starving to death.

---

[1] National Marine Fisheries Service, Endangered Status for Southern Resident killer whales. 70 FR 69903; DFO (Fisheries and Oceans Canada). 2011. Recovery Strategy for the Northern and Southern Resident Killer Whales (Orcinus orca) in Canada. Species at Risk Act Recovery Strategy Series, Fisheries & Oceans Canada, Ottawa, ix +80pp

[2] Krahn, M.M. et al. 2004. 2004 status review of southern resident killer whales (*Orcinus orca*) under the Endangered Species Act. NOAA Technical Memorandum NMFS-NWFSC-62, U.S. Department of Commerce, Seattle, Washington; Reynolds, J.E. H. Marsh & T.J. Ragen. 2009. Marine Mammal Conservation. Endangered Species Research. 7:23-28

[3] Population data from Center for Whale Research, www.whaleresearch.com

[4] NOAA Fisheries. Species in the Spotlight: Southern Resident Killer Whale DPS

[5] DFO (Fisheries and Oceans Canada). 2011. Recovery Strategy for the Northern and Southern Resident Killer Whales (Orcinus orca) in Canada. Species at Risk Act Recovery Strategy Series, Fisheries & Oceans Canada, Ottawa, ix +80pp; National Marine Fisheries Service (NMFS) 2008. Recovery Plan for Southern Resident Killer Whales (Orcinus orca). NMFS, Northwest Region, Seattle, Washington; NMFS. 2014. Southern Resident Killer Whales: 10 Years of Research & Conservation

WDC, 7 Nelson Street, Plymouth, MA, 02360
T +(508) 746-2522 F +(508)746-2537 E contact@whales.org W whales.org
WDC is a registered 501(c)3 non-profit organization.

Research has established that Chinook comprises the majority – up to 80% – of the Southern Residents' diet in the summer months[6], when they usually inhabit the inland waters of the Salish Sea between Washington and British Columbia. Coho and chum salmon are seasonally important, and the orcas' diet appears to diversify and include larger amounts of these types of salmon during offshore coastal foraging periods in the winter and spring[7]. Mortality and birth rates are correlated with coast-wide salmon abundance[8], and a high rate of pregnancy failure in the population has been linked to nutritional stress, with nearly 70% of detected pregnancies ultimately unsuccessful, severely impacting the recovery of the Southern Residents[9].

To survive and thrive, the Southern Resident orcas need reliable and abundant amounts of wild salmon throughout their range. The use of chlorpyrifos in Oregon puts already-struggling salmon populations even more at risk. A recent Biological Opinion from NMFS determined that the use of chlorpyrifos threatens the continued existence of Southern Resident orcas and many salmon populations within their range[10]. Specifically, the Opinion found jeopardy for fifteen ESA-listed environmentally significant units (ESUs) of chum, Coho, and Chinook salmon within the range of the orcas – including ESUs in Oregon.

The impacts of chlorpyrifos on salmon occur during both the adult and juvenile life stages, causing acute lethality, impairment of reproductive and ecologically significant behaviors, reductions in available prey (aquatic invertebrates), and impacts to the growth of juveniles[11]. The decreased survival of salmon caused by chlorpyrifos is also expected to adversely affect the Southern Resident orcas due to the decline of available prey, and the Biological Opinion determined that localized depletions of salmon would result in increased energy demands, nutritional stress, reduced body size and condition, and lower reproductive and survival rates for the endangered orcas[12].

Chlorpyrifos kills the food that salmon rely on, alters their behavior and ability to smell and swim, reduces growth and reproductive success, and amplifies the effects of other pesticides. Among the most toxic and widely-used pesticides in the U.S. in both agricultural and household settings, chlorpyrifos is used without adequate safeguards and poses significant risk to human health, communities, and the environment. The impacts on salmon and

---

[6] Ford, M.J et al. 2016. Estimation of a Killer Whale (*Orcinus orca*) Population's Diet Using Sequencing Analysis of DNA from Feces. *PLoS ONE* 11(1): e0144956. doi:10.1371/journal.pone.0144956; Hanson, M.B. et al. 2010. Species and stock identification of prey consumed by endangered southern resident killer whales in their summer range." *Endangered Species Research*, 11(1):69-82

[7] NOAA Fisheries Northwest Fisheries Science Center. Distribution and Diet of Southern Resident Killer Whales. Presentation by Brad Hanson, July 2015 Program Review; NMFS. 2014. Southern Resident Killer Whales: 10 Years of Research & Conservation

[8] Ford, J.K.B, G.M. Ellis, and P.F. Olesiuk. 2005. Linking prey and population dynamics: Did food limitation cause recent declines of 'resident' killer whales (*Orcinus orca*) in British Columbia. Fisheries and Oceans; Ford J.K.B et al. 2010. Linking killer whale survival and prey abundance: food limitation in the oceans' apex predator? Biology Letters 6: 139–142; Ward E.J, E.E. Holmes, and K.C. Balcomb. 2009. Quantifying the effects of prey abundance on killer whale reproduction. *Journal of Applied Ecology*, 46: 632–640

[9] Wasser S.K. et al. 2017. Population growth is limited by nutritional impacts on pregnancy success in endangered Southern Resident killer whales (*Orcinus orca*). *PLoS ONE* 12(6): e0179824 https://doi.org/10.1371/journal.pone.0179824

[10] NMFS Biological Opinion for Pesticides: Chlorpyrifos, Diazinon, and Malathion. 2017. https://www.fisheries.noaa.gov/resource/document/biological-opinion-pesticides-chlorpyrifos-diazinon-and-malathion

[11] U.S. EPA. 2003. Chlorpyrifos Analysis of Risks to Endangered and Threatened Salmon and Steelhead. Office of Pesticide Programs; Sandahl, J. et al. 2004. Odor-evoked field potentials as indicators of sublethal neurotoxicity in juvenile coho salmon (Oncorhynchus kisutch) exposed to copper, chlorpyrifos, or esfenvalerate. Canadian Journal of Fisheries Aquatic Sciences, 64:404-413; Laetz, C. et al. 2009. The Synergistic Toxicity of Pesticide Mixtures: Implications for Risk Assessment and the Conservation of Endangered Pacific Salmon. Environmental Health Perspectives, 117:348-353; U.S. EPA. 2017. Biological Evaluation Chapters for Chlorpyrifos ESA Assessment. https://www.epa.gov/endangered-species/biological-evaluation-chapters-chlorpyrifos-esa-assessment; U.S. EPA. 2017. Biological Evaluation Chapters for Diazinon ESA Assessment. Appendix 4-1-4. https://www.epa.gov/endangered-species/biological-evaluation-chapters-diazinon-esa-assessment#append3;

[12] NMFS Biological Opinion for Pesticides: Chlorpyrifos, Diazinon, and Malathion. 2017. https://www.fisheries.noaa.gov/resource/document/biological-opinion-pesticides-chlorpyrifos-diazinon-and-malathion

WDC, 7 Nelson Street, Plymouth, MA, 02360
T +(508) 746-2522 F +(508)746-2537 E contact@whales.org W whales.org
WDC is a registered 501(c)3 non-profit organization.

Southern Resident orcas are an example of how wide-ranging the effects of this pesticide can be, not only polluting the environment surrounding areas of use, but also affecting the overall health of our watersheds, salmon, and coastal ecosystems.

To protect Southern Resident orcas, the salmon they rely on, and the health and safety of our shared watershed and marine habitats, I support HB 3058, and I urge the Committee to pass this important legislation this session.

Thank you for your consideration.

Regards,

Colleen Weiler

Colleen Weiler
Jessica Rekos Fellow
Whale and Dolphin Conservation
Newport, OR

For additional information, please contact colleen.weiler@whales.org

From:	Collin Crocker
To:	Exhibits HAGLU
Subject:	Oppose HB 3058
Date:	Saturday, March 23, 2019 9:30:37 AM

Collin Crocker, C & L Farms, Monroe Oregon

As a 4th generation farmer I understand that state and federal agencies regulate pesticides. Legislators do not need to make pesticide use decisions.

Thanks
Collin

Sent from Yahoo Mail for iPhone

Sent from Yahoo Mail for iPhone

WESTERN
WOOD PRESERVERS
INSTITUTE
EST. 1947

March 25, 2019

Representative Brian Clem,
Chair House Committee on Agriculture and Land Use

Dear Chairman Clem:

Subject: Opposition to Oregon HB 3058

The Western Wood Preservers Institute (WWPI) is a non-profit trade association founded in Oregon in 1953. WWPI represents 16 facilities and some 356 employees in the state of Oregon along with industry members from the other western states. Membership includes, wood manufacturers, chemical manufacturers, wood preservers, environmental consultants, equipment providers, inspections companies and product distributors. WWPI serves the interests of the wood preserving industry in so that renewable resources, exposed to the elements, can maintain favorable use in aquatic, building, commercial and utility industries.

This letter is in response to proposed legislation, HB 3058 relating to listing neonicotinoids as restricted use pesticides under ORS 634.316. Specifically, the bill includes Imidacloprid in the definition of Neonicotinoid thereby including several preserved wood products that utilize Imidacloprid as a co-biocide to protect wood structures. Namely Propiconazole, Tebuconazole Imidacloprid (PTI) which is 4.8% Imidacloprid. Another wood preservative DCOI utilizes small Imidacloprid additives of less than 2% to help protect from termites and fungi.

To be approved for use, all wood preservatives must, in the words of the EPA, quote “show that they can be used without causing unreasonable adverse effects to human health or the environment.” This bill has an impact on nontraditional pesticide applicators. Wood is protected from decay, rot, mold, and wood eating insects by putting the wood into a closed cylinder where the preservative is pressurized into the wood, then excess preservative is vacuumed out leaving the wood sterilized. The preservative is maintained in controlled storage tanks and any drippage is collected so the preserved wood industry has zero pollinator impacts.

It is important for the wood preservation industry to have options as to which preservative to use and on which commodities on a case by case basis. For example, in some site-specific applications there is a need to avoid heavy metals that could impact sensitive aquatic environments, such as copper impacts on fish. PTI or DCOI would be among those alternatives that ensure that the preserved wood used is both sustainable and safe.

We need the safety of preservatives. They protect our wood infrastructure from rail ties, and utility poles to guardrails along the freeway and pilings at ports. In fact, the very first board installed in every house, the sill plate, is preserved wood. It protects the rest of the lumber and thus protects the house from decay, insects and rot. The state even uses Imidacloprid in a number of applications including bridge handrails to protect the wood and provide a disinfected surface to touch.

Through preservative treating, we add to sustainability by making wood last for decades, far beyond the time it takes to grow a new tree to supply our future needs. This is the essence of sustainability and no other material offers this benefit. In its current form, the bill is counterproductive toward its intended goal of environmental stewardship.

Sincerely,

Dallin Brooks
Executive Director
Western Wood Preservers Institute

12503 SE MILL PLAIN BLVD. • SUITE 205 • VANCOUVER, WA • 98684
360-693-9958 • www.WWPI.ORG • EMAIL@WWPI.ORG

From:	dbsandau@juno.com
To:	SENR Exhibits; Exhibits HAGLU
Subject:	oppose sb853 & hb3058
Date:	Monday, March 25, 2019 12:08:07 PM

Agriculture needs clorpyifos to be economicly competive or it will loose certain crops, which account for millions of dollars for the state. This chemical helps growers to use no-till in there operation, otherwise we would have to work the ground. This would considerably increase erosion and tractor field work. Some soils are classified HEL (highly erodible land) which no-till is used frequently. I have some fields that have not been worked for 20 yr. because of erosion issues. All these bills; cape & trade, HB2007, HB2835, HB3327, HB3031, HB3044, HB2659, SB103, Sb104, SB876 will directly or indirectly cause a loss of farm gate profit. We can not pass these costs on, because we operate on free market. The future of family farms is seriously in question.

Dan Sandau 503-991-0204

From: Dana Tuckness
To: Exhibits HAGLU
Subject: HB3058
Date: Monday, March 25, 2019 10:12:05 AM

Chair Clem and Committee,

I urge you to oppose HB3058 due to the dire consequences it would have on Oregon agriculture. I am a 5th generation Oregon food producer from Malheur County, my family settling here in the 1860's. My current rotation of crops are wheat, sugar beets, dry bean seed and corn. Chlorpyrifos is labeled for most of the crops grown in my area. It is an extremely important, safe pesticide which I have been using for many years. There are crops which would have no replacement, were we to lose the use of this product. This could devastate the production of these crops. Inexpensive proven pesticides are needed to continue the safe production of food for the people of Oregon and the world.

Neonicotinoids are another very important product that are used in production on my farm. It is used in seed treatment and gives the emerging plant a leg up against many pests such as wire worm and aphids, which can cause a huge loss of production. A local bee keeper brings honey bees out to my fields every year just for the production of honey, as none of my current crops require the use of pollinators. There has not been a problem with loss of bees due to the use of any of the pesticides being used on my farm including neonicotinoids.

Please say NO to HB3058. Thank you.

Sincerely,

Dana Tuckness
Ontario, Oregon

From:	Daryl Jackson
To:	SENR Exhibits
Cc:	Exhibits HAGLU
Subject:	Senate Bill 853 comments
Date:	Monday, March 25, 2019 6:18:42 PM

The small rural Community of Williams, in Southwestern Oregon is primarily an organic farming town.

For over 25 years we have supported herbicide reducing policies with Josephine County for the same issues addressed by SB 853 and HB 3058.

For our community it has always been an issue that public agencies were not comprehensively educated or trained in herbicide composition and application. Chemical compounds containing chlorpyrifos and nicotinoids were commonly applied.

It is certainly true that herbicides such as those containing chlorpyrifos and nicotinoids are also available to untrained private applicators.

Particularly concerning is the common practice of blending several such chemicals. No adequate studies address the additive effect of such blends.

The negative effects of nicotinoids on pollinators are alarming to an agricultural community like Williams.

Our Williams Creek watershed contains miles of high quality essential habitat for threatened and endangered Salmon and Steelhead. Both species are vital for important recreational and commercial fisheries.The cummulative negative and additive effects of herbicides on fish are well known.

We are also deeply concerned about the probable neurological effects, on all biota, of these chemicals.

It seems entirely appropriate that the chemical manufacturers bear resposibility for fees. Communities like Williams have born the external and direct costs of herbicide application.

Sincerely,
Daryl Jackson M.S. Biology
Executive Director
Williams Water Way

David S. Wall
P.O. Box 756 Newberg, Oregon 97132; [(408)-287-6878]

Via Electronic Mail

March 26, 2019

To: House Committee on Agriculture and Land Use; **Representatives** Noble; Post; **Senator**: Thatcher; Senate Committee on Environment and Natural Resources

Re: Issues: Prohibition of Chlorpyrifos, Pesticide Reporting, Reexamination fee, Qualifying licenses

[HB 3058]:https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/HB3058/Introduced
[SB 853]: https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/SB853/Introduced
[HB 2980]: https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/HB2980/Introduced
[HB 2058]: https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/HB2058/Introduced
[SB 854]: https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/SB854
[SB 855]: https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/SB855/Introduced

Consider: Combine and consolidate all of the aforementioned bills into one coherent piece of legislation.

[HB 3058] and **[SB 853]** are almost mirror images of one another. Both bills prohibit the sale of the organophosphate pesticide "Chlopyrifos" but, the Senate Bill amends "pesticide registration fee" and "reduces maximum fee for certain occupational licenses related to pesticides." Both House and Senate Bills intent is to place all "neonictinoid pesticides" under "restricted use."

I have concerns with certain elements of **[SB 853].** Clarification is needed on how **[SB 854]** and **[SB 855]** will be interpreted and or applied to the licensing requirements for pesticide applicators and or consultants.
[SB 854] states, "Directs professional licensing Boards, in certain circumstances, to accept "individual taxpayer identification number" or other "Federally-issued identification number" in lieu of "Social Security number" on applications for issuance or renewal of authorization to practice occupation or profession."
[SB 855] states: "Directs professional licensing Boards, to develop pathways of licensure, certification or other authorization to practice occupation or profession for specified persons." Both **[SB 854]** and **[SB 855]** may have deleterious effects on licensure and certification for "pesticide applicator" and or "pesticide consultant" professions and who gets access and authorization to "restricted use pesticides." Can and will "illegal aliens" obtain "pathways" to licensure, certification or other authorization procedures to become "pesticide applicators" and or "pesticide consultants" thereby gaining access to "restricted use pesticides?"

[HB 2980] states, "Extends sunset date of pesticide use reporting system." Should the "pesticide use reporting system" be periodically reviewed, made current and have "No" sunset date? I think so.

[HB 2058] states, "Relating to the charging of reexamination fees to applicants for licensing in pesticide trades. Eliminates reexamination fee for pesticide applicator and pesticide consultants." This is wrong. ***There should be a significant reexamination fee for failure and here is why***: One of my neighbors is a licensed "pesticide applicator" having access to "restricted use pesticides." This neighbor informed me upon questioning as to licensure, "There is only one test. If you fail the test, all you have to do is review your wrong answers and retake the test as many times as you need to pass the test and receive your license." I do not know if this is a true statement or just a "joking" one but, a thorough and complete review of testing content and methodologies (like having multiple tests and only giving out scores and not answers) must occur to prevent the possibility of applicants who haven't the education and requisite knowledge of the chemistry and biology of pesticides and the dangers of misuse is troublesome and should be immediately remedied if found defective.

Respectfully submitted,
/s/ David S. Wall

David S. Wall
P.O. Box 756 Newberg, Oregon 97132; [(408)-287-6878]

From: Debby Garman
To: Exhibits HAGLU
Cc: Rep Susan McClain; Rep Sollman
Subject: Testimony in support of HB 3058
Date: Monday, March 25, 2019 11:59:10 AM

To the House Agriculture and Land Use Committee:

Please accept this testimony in support of passage of SB 853:

As an Oregon citizen and beekeeper concerned about both pollinator survival and human safety, I urge your committee to move forward to pass SB 853 to ban the purchase, sale, and use of Chlorpyrifos and to reclassify all biocides containing Neonicotinoids as Restricted Use Pesticides requiring certification and training before buying, selling, or disseminating this particularly highly toxic class of pesticides. As more and more scientific evidence accumulates, it has become very clear that both Chlorpyrifos and Neonicotinoids are highly dangerous in their impacts on life forms large and small.

For the benefit of many living beings, removing neonicotinoid pesticides from store shelves in Oregon will be beneficial. In addition making it easier for affected agricultural interests to get the training they need by reducing certification costs and increasing the annual fee paid by pesticide manufacturers are great ideas. This Bill has much to recommend it.

Thanks so much for your work to move this important bill forward to passage in this legislative session.

Debby Garman
Hillsboro, Oregon
debbygarman@gmail.com
503.318.5227 mobile

From:	Hopper Bros
To:	Exhibits HAGLU
Subject:	House Bill 3058 - Chlorpyrifos ban
Date:	Monday, March 25, 2019 9:00:13 PM

March 25, 2019

I would like to comment on the proposed ban for Chlorpyrifos. Being a farmer in Oregon with nearly 50 years of farming experience provides me with a broad understanding of the issue. I rarely provide comments, but Chlorpyrifos is an extremely important product for us. Please note that we are involved with both organic and conventional crop production. We consider all other options in the IPM management program that we adhere to, before carefully handling and applying Chlorpyrifos.

Within our operation we apply Chlorpyrifos on 10 or more crops. Many of these crops we have no alternatives. Two examples of these are cabbage and Christmas trees. There are NO substitutes for controlling Cabbage Root Maggot and Symphylans. Without Chlorpyrifos, production of cabbage and other brassica crops would be effectively eliminated from production in our operation. With the cancellation of Thionex several years ago only Chlorpyrifos remained effective against Douglas Fir Twig Weevil. While there are other registered products for Douglas Fir, they do not control this pest. In addition, the alternatives greatly reduce good insect predator populations. When the good predator population is reduced, our experience is that yet more spray applications are needed to control other destructive insect population explosions that these predators would normally control. The Douglas Fir Twig Weevil has become more widespread and aggressive in recent years. Loss of Chlorpyrifos would be especially devastating as we are entering the low inventory phase of the Christmas tree production cycle. Shortages started to appear in the 2017 marketing season and will likely persist for another six plus years. Trees infected with Douglas Fir Twig Weevil quickly become unmarketable. If light infestations prevent exporting. Mexico has a zero tolerance for this pest and they inspect every load at the border.

If an insect pest must be controlled by Chlorpyrifos and there are no alternatives, then we will be forced to drop that crop from production. This would be most disruptive to our crop rotation resulting in other negative consequences for erosion control, soil health, salmon habitat and the promotion of other wildlife. Several crops that we now produce conventionally we are unable to grow organically because they generally require an application of Chlorpyrifos to control an insect pest. We must have replacements available before loosing Chlorpyrifos. Please do not vote to ban Chlorpyrifos, especially before alternatives are available in the marketplace.

Sincerely,

Dennis K. Hopper

Hopper Bros.
33285 South Barlow Road
Woodburn, Oregon 97071

Phone: 503-651-2493
Fax: 503-651-3766
Visit our website to view our beautiful trees:www.hopperbros.com
sales@hopperbros.com

From: Dewey Caron
To: Exhibits HAGLU
Subject: I support HB 3058
Date: Sunday, March 24, 2019 10:30:50 PM
Attachments: image.png
ChlorpyrifosFactSheet_SB853 (1).pdf

Submitted Testimony of Dr Dewey M. Caron, retired Entomologist, in support of SB853

I am a retired Professor of Entomology & Wildlife Ecology from University of Delaware and Affiliate Faculty member of the Department of Horticulture Oregon State University. When I retired in 2009 I moved to Portland Or to be closer to grandkids. I continue my interest with honey bees and extension efforts on improving Honey Bee Health

I write to support passage of HB 3058 that would ban purchase and sale of the Insecticide Chlorpyrifos and restrict use of neonicotinoids to trained individuals by licensing them as Restricted Use pesticides.

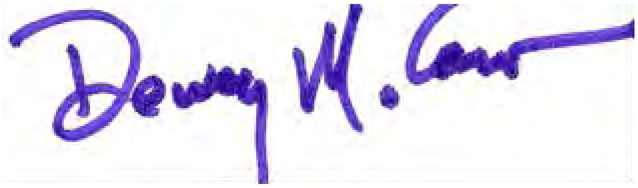
The unfortunate decision by the Federal Environmental Protection Agency (EPA) to delay cancellation of use of Chlorpyrifos, as recommended by most experts, continues to put Oregon citizens and our honey bee populations at unnecessary risk. Scientific studies have linked chlorpyrifos to brain damage in children, autism, cancer, reduced IQ, loss of working memory, attention deficit disorders and Parkinson's disease. ATTACHED fact Sheet provides details and sources.

Chlorpyrifos is consistently among the top 5 pesticide compounds found in residue sampling of bees and honey from Honey bee colonies. There are useful alternatives to this insecticide. It is time to begin to get it out of our environment; a ban on use in Oregon will help begin to reduce its presence. We need to take a pro-active stance in Oregon since leadership is lacking from EPA.

I testified last year relative to OR legislation to seek to place neonicotinoids on restricted use status but the legislation never made it out of committee. Neonicotinoids have been found in residue studies of common foods consumed in Oregon, taken form our own outlets. Numerous studies have demonstrated negative effects of neonicotinoids on individual honey bees and residue studies have revealed them present in colonies and bee bodies were analyzed.
Efforts are underway to seek voluntary removal of neonicotinoids from point-of-sale sites so homeowners do not have ready access to them but we need do more to help protect our citizens and pollinators such as honey bees. Restricting their use and providing better training to users of these compounds would help potentially to reduce their negative effects.

I strongly urge you passage of HB 3058 and passage to the full house for their enactment of this legislation to help protect the health of OR citizens and our environment, especially our highly vulnerable honey bee pollinator populations.

Thank you



Attachment on Chlopyrifos

(\
-({{{8- Dewey
(/

TEL 302 353-9914 Telephone

CHLORPYRIFOS HARM PEOPLE

Chlorpyrifos is linked to infertility, diabetes, respiratory diseases, developmental disorders and more.

Children are especially susceptible to exposure, resulting in brain damage and developmental disabilities.

Farmworkers and rural communities are at highest risk of exposure from drift.

Communities are exposed to drift from nearby fields and golf courses in their homes, schools and outdoor areas.

Chlorpyrifos is highly toxic to birds, fish and beneficial insects such as bees. [5]

There is no safe level of chlorpyrifos in drinking water. [5]

Chlorpyrifos are particularly dangerous for pregnant women because of their toxicity to the developing infant.

FARMWORKERS AND CHILDREN ARE AT RISK

Chlorpyrifos is very harmful to farmworkers and are linked to developmental disabilities in children.[1] These are highly toxic nerve agent pesticides that can damage the developing brains of babies and children, leading to lower birth weight, reduced IQ, loss of memory, and delayed motor development.[2] It is also toxic to farmworkers — regularly sickening them and sending them to the hospital. Many farmworkers are afraid to report pesticide exposure because they're afraid of being fired or reprimanded.[3]

WILDLIFE AND WATER

The National Pesticide Information Center (NPIC) lists chlorpyrifos as "highly toxic" to fish, aquatic invertebrates and bees. It may build up in the tissues of fish and aquatic insects, poisoning animals up the food chain. The half-life of chlorpyrifos in soil is between 60 and 120 days, but can span over 1 year depending on the soil type and weather conditions.[4 5]

[1] "Children's Exposure to Chlorpyrifos and Parathion in an Agricultural Community in Central Washington State." National Institute of Environmental Health Sciences, U.S. Department of Health and Human Services, ehp.niehs.nih.gov/doi/abs/10.1289/ehp.02110549.
[2] "Rotenberg, Joshua S., and Jonathan Newmark. "Nerve Agent Attacks on Children: Diagnosis and Management." Pediatrics, American Academy of Pediatrics, 1 Sept. 2003, pediatrics.aappublications.org/content/112/3/648.short.
[3] Morones, Alyssa, and Alyssa Morones. "Pesticide Continues to Put Farmworkers and Fetuses in Harm's Way." California Health Report, California Health Report, 8 Sept. 2017, www.calhealthreport.org/2017/08/31/pesticide-continues-put-farmworkers-fetuses-harms-way/.
[4] "Chlorpyrifos." National Pesticide Information Center, npic.orst.edu/factsheets/chlorpgen.html.
[5] "Chlorpyrifos." National Pesticide Information Center, npic.orst.edu/factsheets/archive/chlorptech.html

FROM: The Oregon Zoo

TO: House Committee on Agriculture and Land Use

SUBJECT: Support for HB 3058

Chair Witt and members of the Committee on Agriculture and Land Use,

The Oregon Zoo is writing to express our strong support for HB 3058 and companion legislation SB 853.

The Oregon Zoo is dedicated to the welfare and conservation of Oregon's native species as well as imperiled wildlife around the world. In partnership with federal and state agencies and non-governmental organizations, we work to recover populations of endangered species including California condors, coastal butterflies and western pond turtles. We represent more than 44,000 member households and each year welcome more than 1.5 million visitors—more than any cultural institution in the greater region. They come because they are fascinated by, and care about, wildlife. By offering up-close encounters with a wide variety of animals at the zoo and sharing inspiring stories and videos through our expansive social media reach, we educate millions of people about the complex issues facing wildlife, including our own Oregon native species, and we encourage them to help us address these issues.

We are especially concerned with the decline in insect populations, both globally and locally. Insects serve essential functions in the ecosystem, often as the sole or significant food source for countless animals including migratory and native birds. Pollinators in particular serve a critical function to humans and in the natural system as a whole. Recent studies indicate that as many as 40 percent of pollinators may be at risk of extinction, with pesticide contamination as one of the key factors in this decline.

This decline is affecting both our honey bee populations and our native bees and butterflies. In Oregon, incidents of inappropriate use of this neonicotinoids made headlines by causing the death of thousands of native bumble bees. Neonicotinoids are persistent in the environment and have the potential to harm other animals and humans in addition to insects and thus are strongly regulated in Europe.

There are four species of insects federally listed as endangered in Oregon. The Oregon Zoo is working with partners to recover two of them--the Taylor's checkerspot and Oregon silverspot butterflies. This work has been underway for 25 years. Widespread insecticide use threatens this effort. We want to see recovery and reduce the risk of additional listings.

The Oregon Zoo is engaged in teaching our visitors about the importance of pollinators and how they can help support these important animals by creating habitat in their own yards and businesses and reducing or eliminating use of toxic chemicals. While education is important, it

4001 SW Canyon Road Portland, Oregon 97221 503 226 1561 **oregonzoo.org**

is not enough. We strongly support this legislation's limits on use of neonicotinoids to those who have received proper training in their application.

The Oregon Zoo is grateful for this opportunity and for your consideration of this important matter.

Respectfully,

Dr. Don Moore
Director, Oregon Zoo

Dustin Welters Testimony on HB3058

Hello,

My name is Dustin Welters and I am a Crop Advisor in Albany, Oregon and the surrounding area. I graduated with a degree in Crop & Soil Science from Oregon State University.

Part of my job is to help my customers be successful in raising their crops; this means using a variety of pesticides that we have in our toolbox to combat insects, weeds, diseases and more. One of these tools is chlorpyrifos.

Oregon is the world's largest producer of cool season grasses (estimated farm gate value of $455 million), the number one producer of Christmas trees in the U.S. (wholesale value of $90 million), and also a premier production region for specialty seeds and clover seeds (farm gate value of roughly $70-$80 million). While these are major crops for Oregon farmers, they represent a small blip of nationwide agriculture as compared to corn, soybeans, and wheat. This means as crop advisors and farmers we rely heavily on Section 24(c) Special Local Needs labels, and Special 2(ee) recommendations in many of our crops, which means there are no other alternatives to address specific pest pressures for designated crops.

Lorsban Advanced Insecticide has 6 of these labels in Oregon:

24(c):

1. For Control of Garden Symphylans in Table and Sugarbeets or Swiss Chard Grown for Seed
2. For Control of Insects Infesting Perennial Grass Grown for Seed
3. For Control of Various Insects Infesting Clover Grown for Seed
4. For Control of Cutworms and Lygus Infesting Carrots Grown for Seed
5. For Control of Cutworms Infesting Radish Grown for Seed
6. For Control of Various Insects infesting Cottonwood/Poplar Grow for Pulp or Wood

2(ee):

1. For Control of Flatheaded Borer in Filbert
2. For control of Root Maggots, Cutworms, Symphylans, Billbugs, Wireworms, Grubs in Veg

While I could sit here and speak to the importance of chlorpyrifos in all of these crops I'd like to high light one.

In Christmas tree plantations we struggle with many damaging insects such as scale, weevils, aphids, midges, ants, moths, and the list goes on. While there a handful of insecticides labeled in Christmas trees, chlorpyrifos is by far the most efficacious and cost-effective option for Oregon farmers. Eliminating chlorpyrifos registrations would put Oregon farmers at a disadvantage in the marketplace and make it tougher to meet sanitation standards for Christmas trees that are exported out of the state and country.

As crop advisors and farmers, the safety of our food supply and workers is our number one priority. We strictly follow all Worker Protection Standards and pre-harvest intervals for pesticides, including chlorpyrifos.

The removal of this tool from our toolbox would be devastating to Oregon's agricultural economy. I strongly urge you to vote NO on this bill.

Dustin Welters
Scio, Oregon
Crop Advisor
Pratum Coop

Dustin Welters Testimony on HB3058

From:	Elizabeth Wright
To:	Exhibits HAGLU
Subject:	Please Oppose HB 3058 & SB 853 - maintain our pest management tools
Date:	Monday, March 25, 2019 10:30:07 AM

Dear Chair Clem,

HB 3058 and SB 853 are unnecessarily banning chlorpyrifos which will remove this valuable pest management tool from Oregon's farmers. Chlorpyrifos has been used in cropping systems for over 4 decades, is authorized for use in nearly 100 countries and is labelled for use on more than 50 agricultural crops. These bills put Oregon growers, who must compete in the interstate and international markets, at a significant disadvantage.

Oregon farmers grow over 225 different crops, and chlorpyrifos is a vital tool on specialty crops when there is no alternative pesticide available. Keeping this tool available is critical to controlling crop-damaging insects in Oregon's Christmas trees, vegetables, mint, and many of our crops grown for seed such as clover, radish, and perennial grass.

HB 3058 and SB 853 also unnecessarily classifies all neonicotinoid products as Restricted Use in Oregon. In order to be classified as GENERAL USE by the U.S. Environmental Protection Agency, these products are required to clearly demonstrate their safety to mammals and birds. Oregon does not have any data that justifies limiting these products to licensed pesticide applicators only. Neonicotinoid products (over 625 registered in Oregon) are currently available to any user including farmers and homeowners. Neonicotinoids have been extremely valuable in Integrated Pest Management (IPM) systems to allow selectivity in controlling harmful pests while allowing beneficial insects to thrive.

Honey bees and other pollinators are very important, not only to agriculture, but also to the gardens and landscapes that people enjoy in both urban and rural environments. Over the last several years, many steps have been taken to protect pollinators at the state and federal level. The product labels are more restrictive, and Oregon is a leader in pollinator education through Oregon State University Extension. If pesticides are used as required by the product directions, the risks to pollinators are significantly reduced. It is not necessary to put such severe restrictions on this entire class of chemicals when other ways of addressing pollinator health are working.

Please join me in opposing HB 3058 and SB 853 to maintain current pest control tools and protect Oregon crops.

Sincerely,

Elizabeth Wright
11235 Portland Rd NE
Salem, OR 97305
liz.nwonion@gmail.com

To who it may concern,

I am Gary Rondeau, a beekeeper and a scientist living in Eugene Oregon. I have studied the problem posed by insecticides on honeybees and other invertebrates beginning in about 2010 when I personally started to have trouble keeping my bees alive. I took on the task of identifying the most likely culprits for our bee declines and colony collapse that beekeepers across the country were experiencing. Beekeepers have been dealing with pesticides for many years, so I was at first not convinced that pesticides were the issue. However, the new class of pesticides that were becoming popular, the neonicotinoids, had some problematic properties that raised red flags. The issue that bothered me was what happened if you had low doses of the pesticide present for long periods of time. I looked at various research papers and concluded that this was an issue that needed further attention. I wrote a blog article on the subject that eventually became a published article: https://www.nature.com/articles/srep05566

Delayed and time-cumulative toxicity of imidacloprid in bees, ants and termites

- **Gary Rondeau**
- , **Francisco Sánchez-Bayo**
- , **Henk A. Tennekes**
- , **Axel Decourtye**
- , **Ricardo Ramírez-Romero**
- & **Nicolas Desneux**

Scientific Reports volume4, Article number: 5566 (2014)

The article has been cited many times and I like to think of it as a chink in the armor that allowed the European Union to effectively ban the neonicotinoid pesticides throughout Europe.

In the process of learning about pesticides I have come to a much better understanding of their biological mechanisms and their environmental shortcomings. This has resulted in two blog articles that are not overly technical which I believe would benefit decision makers to understand the issues at hand. The links are here:

https://squashpractice.com/2014/06/15/the-mechanisms-of-neuro-toxic-pesticides/

https://squashpractice.com/2017/12/03/threshold-mechanisms-in-acetylcholine-pathway-insecticides-and-environmental-safety/

The point I wish to stress in the second article is that a key means to ensure environmental safety for chemical pesticides is that they exhibit a strong "threshold" type of non-linear dose-response action. Pesticides that exhibit strong threshold action include the organophosphate and carbamate classes of chemicals. Strong threshold action means that low residual doses of these chemicals are relatively benign. In contrast, chemicals without a strong threshold action begin to sicken target and non-target organisms at sub lethal doses and can pose unacceptable environmental risks at almost undetectable levels when organisms are continuously exposed to these nerve toxins.

Finally, recent studies have shown that the neonicotinoids not only attack synaptic nervous system receptors, but that these same receptors are commonly present on insect immune cells. These studies have provided the mechanism for what has been observed in the field, that colonies exposed to low levels of neonicotinoids often succumb to a pathogens, often multiple pathogen species when colony collapse occurs. I reference several of these studies in the articles linked above.

The neonicotinoids are a very dangerous environmental hazard. They are likely a significant factor in the widely reported insect apocalypse where large fractions of the wild insect populations have disappeared. The neonics are water soluble so they move when it rains, eventually finding their way to the oceans. We need to stop using them immediately and hope that some of the lost insect diversity will recover.

Below are copies of the linked articles from my blog.

Thank you for your consideration.

Gary Rondeau, Ph.D.

1025 Elkay Drive,

Eugene, OR 97402

The Mechanisms of Neuro-toxic Pesticides

Gary RondeauJune 15, 2014Beekeeping, Ideas, Pesticides, Popular, ToxicsEdit"The Mechanisms of Neuro-toxic Pesticides"

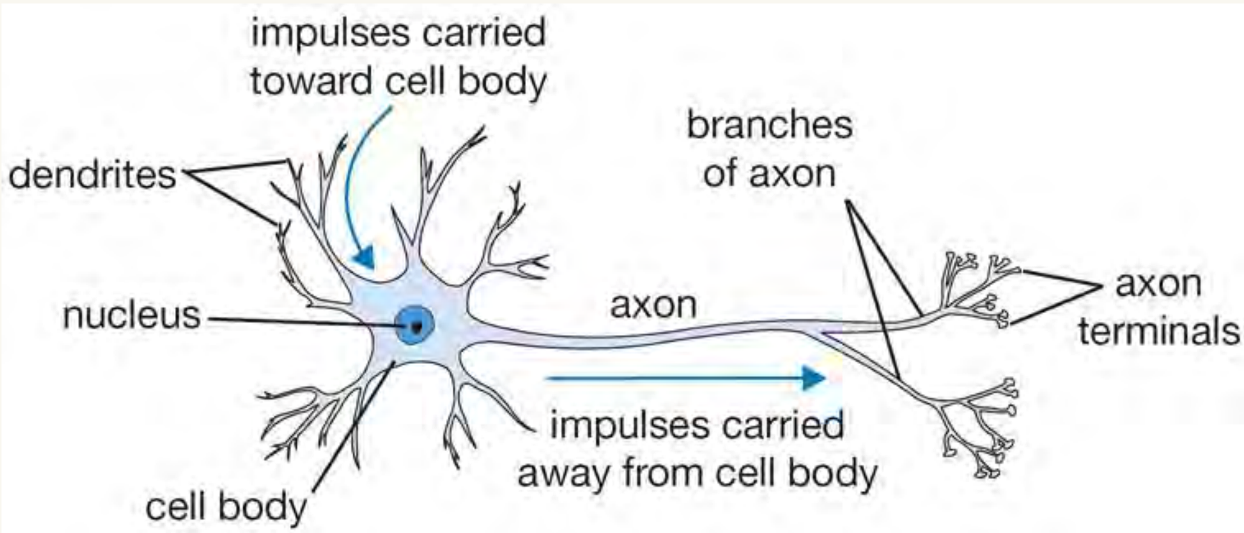
Post navigation

Previous
Next

Agricultural pesticides have become part of the chemical landscape that we all live in. To be able to make intelligent decision about the use and regulation of these chemicals, it's important to understand how they work. Almost all modern pesticides are chemicals that interfere in some way with the nervous system. The characteristics of the chemical interaction with the nervous system function can shed light on the effectiveness of the pesticide and on its physiological effects at residual levels. We will start by looking at how some of the normal processes of the nervous system work, because it will be disruption of those processes that lead to toxic effect. Then we will look at the mode of action for three major classes of pesticides and how they specifically interfere with normal function. In a future article we will look at how the specific mechanisms of action can effect dose scaling relationships.

Normal Neuron Function – Neurons, action potentials, sodium and potassium voltage gated ions channels, and ion pumps

The nervous system of insects and humans share many common features, starting with the basic structure of the neuron.



There are many variations on the same theme in different parts of the organism. Terminal branches can attach to dendrites of other neurons at synapses, or through motor synapses to muscle cells. Individual neurons are connected in complex, interacting networks by the synaptic connections. Information processing involves summing the inputs from many neurons and generating an output. When the summed stimulus is high enough, the neuron will generate an electrical pulse that is sent along the axon and which will, in turn, stimulate multiple downstream neurons connected through synapses to the axon branch terminals.

Neuronal signalling is accomplished by way of "action potentials", which are short electro-chemical pulse that travel along the neuron axon. The short pulse-like nature of the nerve signals are generated and maintained by way of "voltage-gated" ion channels and ion pumps. Ion pumps use the cellular energy store, ATP, to move sodium and potassium ions across the cell membrane, setting up a concentration gradient across the membrane that establishes a "resting potential" of about -70mV from the inside to the outside of the nerve cell. Once this gradient is established, then merely opening ion channels in the cell wall allows the sodium or potassium ions to move back across the membrane and move the potential closer to zero. Nature's trick, that turns this process into a useful information processing network, is to open the ion channels which depolarize the neuron with a positive feedback action associated with the membrane potential. Once the membrane potential rises from its resting potential to a "threshold" the voltage gated channels open, steepening the rising edge into the action potential nerve pulse. The figure below is a nice schematic of the 'anatomy' of the action potential.

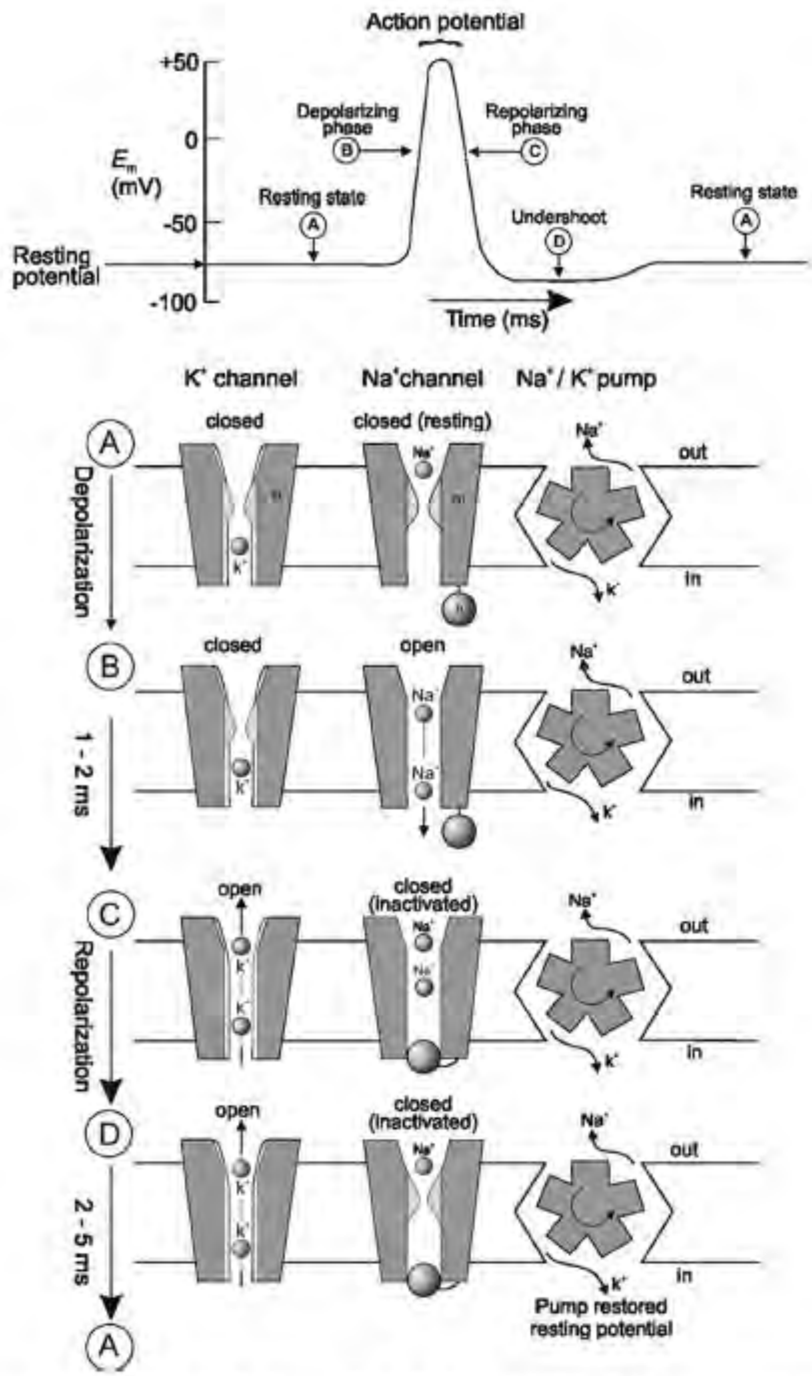
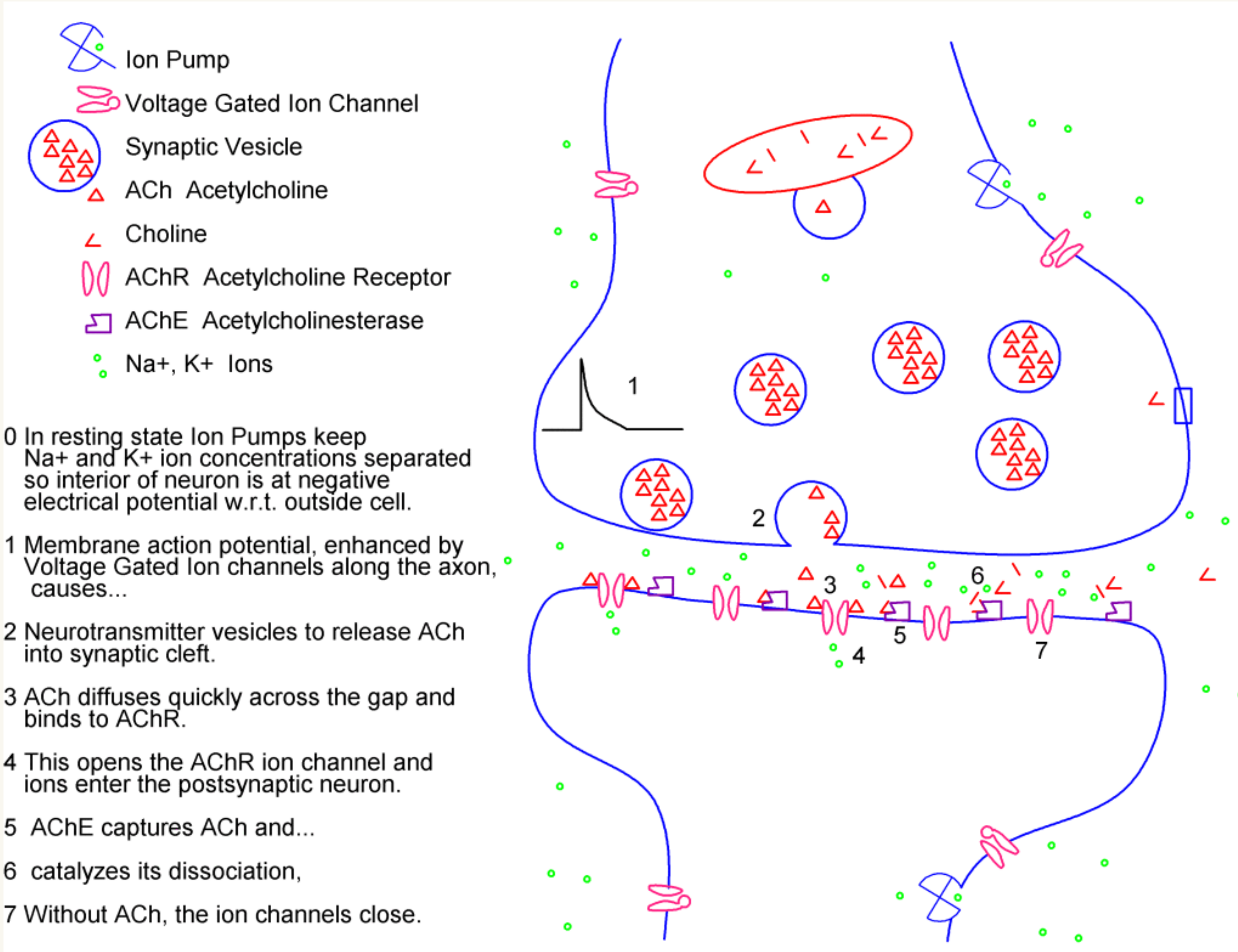


Figure 2. Generation of an action potential. The extracellular fluid surrounding the insect axonal membrane contains a high concentration of sodium ions (Na^+) and a low concentration of potassium ions (K^+), whilst the reverse is true for the inside of the nerve cell. At the resting potential (A) the axonal membrane is relatively permeable to K^+ but not Na^+. This makes the inside of the cell negative with respect to the outside, the difference in potential being around -60 mV. Nerve stimulation causes the axonal membrane to become permeable to Na^+ due to the sodium channel opening (B). This causes the inside of the axon to become transiently positive and generates the rising phase of the action potential. Sodium channel closure or inactivation (C) (usually within 1 ms) causes an efflux of K^+ as a result of opening of potassium channels and generates the falling phase of the action potential. The generation of the action potential results in sequential depolarization of neighbouring regions of the axon, resulting in a wave of depolarization along the axon. An ATP driven Na^+- K^+ pump maintains the ion gradient across the axonal membrane (D) and restores the resting potential. Continued transmission of the impulse across the synapse involves release of a chemical transmitter, which becomes attached to receptor sites at the postsynaptic membrane where it depolarizes the membrane to generate another action potential.

From Davies et al. 2007. DDT, pyrethrins, pyrethroids and insect sodium channels. Signaling happens by way of the action potentials, which propagate along the axons and terminate at the synapse. There are several ways the action potential can be interact with cellular structures. We will concentrate on the acetylcholine mediated synaptic response because this is the target of several pesticide chemicals.

Normal Synapse Function – acetylcholine-mediated transmission



Acetylcholine (ACh) is a molecular neurotransmitter that conveys information across the synapse. In the figure above, the basic steps of the interaction are illustrated. Action potentials, those pulses of neural activity, cause synaptic vesicles containing ACh to release the ACh molecules into the synaptic cleft, the junction region between the two cells. The ACh quickly diffuses across the narrow junction region and is captured by acetylcholine receptors (AChRs) that are part of ion channel molecules. The AChRs that have captured an ACh molecule open the ion channel and allow Na+ ions to enter the post-synaptic neuron. The binding is transitory, however; the ion channels rapidly open and close as the ACh molecules latch and unlatch from the AChR channel. Meanwhile, another ACh receptor is also present in the synaptic junction called acetylcholinesterase (AChE). This molecule is an enzyme which rapidly breaks apart the acetylcholine into choline and acetate, effectively ridding the synaptic cleft of the neurotransmitter almost as fast as it is made available. The result of all of this chemical activity is that the AChRs, as an ensemble, are open only for a few milliseconds. During this time, ions flood into the post-synaptic dendrite, depressing the potential in the down stream neuron, making it more likely to generate its own action potential.

This simplified discussion leaves out many details. There are many more specialized molecules that are part of cell membranes. Often molecules that are specific for one important function also are involved in unrelated functions. Nerve cells can be specialized and synaptic details can vary. Nevertheless, the basic picture we are painting is valid across much of the animal kingdom. These same basic process happen in the nervous systems of humans and bees alike. Now let us move on to discuss ways to interrupt these normal processes for insecticidal effect.

Insecticides targeting axonal voltage-gated ion channels

Two major classes of insecticides target the voltage gated ion channels shown in our cartoon. The organochlorines (e.g. DDT, dieldrin, chlordane) and pyrethroids (e.g. deltamethrin) act by opening these voltage gated ion channels. The molecules hold open the channels and allow ions into the axon that depolarizes the neuron. In the depolarized state the neuron is non functional, characterized by paralysis. In between the normal state and paralysis there is a range where the depolarization of the neuron is only partial. Partial depolarization leaves the neuron susceptible to "false triggering". A small stimulus that would normally not trigger an action potential will produce one more easily as the resting potential gradually climbs to the threshold required to launch an action potential. Organisms in this state typically exhibit twitching and uncontrolled movements as the uncontrolled nerve impulses trigger muscles to move.

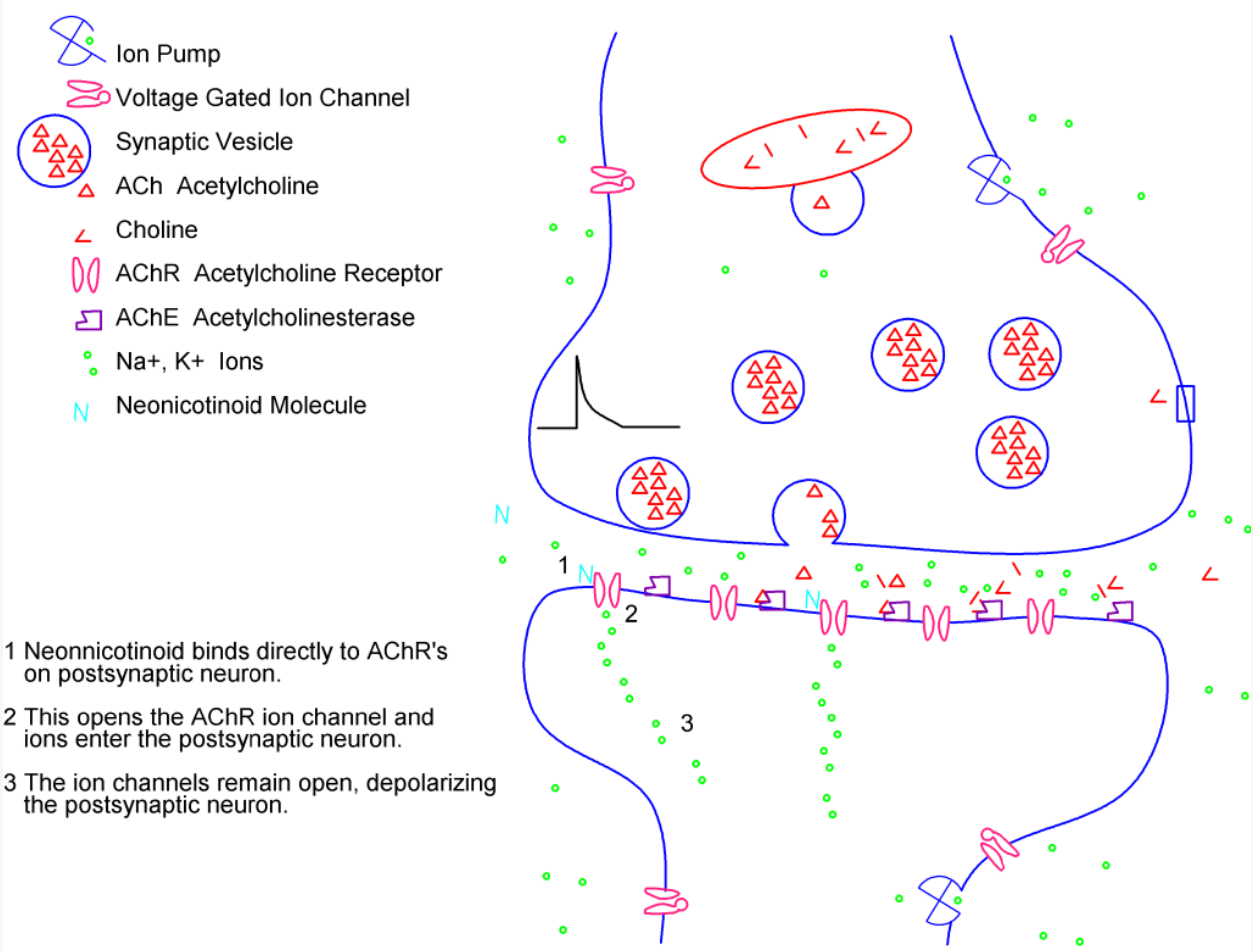
Nothing is static at the molecular scale. As organic molecules interact with one another, they can latch onto each other either very loosely or with tenacity depending upon the exact shape of the molecules involved and type of binding that happens. Binding that occurs via the covalent sharing of electrons is usually very strong, essentially permanent and irreversible. In contrast, many biological molecules interact through polar or Van Der Walls forces that are much weaker. Such interactions may last for a fleeting amount of time before thermal fluctuations pull them apart. Weak binding is reversible and can be characterized by a dissociation time, how long it takes to break the bond due to random and thermal fluctuations.

When dealing with pesticide chemicals, stronger bonds mean the insecticide is spending more time at the active site, so its potency is higher. Frequently it is just how tenacious the binding that determine the potency of the insecticide.

Chemical scavengers known as cytochrome P450 enzymes are always on the lookout for foreign chemicals which these enzymes break down into smaller parts in the process of metabolizing and eliminating unwanted molecules. Often, within a few hours much of a foreign chemical will be metabolized and eliminated from the organism. Bound molecules are not as easily digested by the cytochrome P450s so once toxins are bound to their site of action, they are more immune to detoxification.

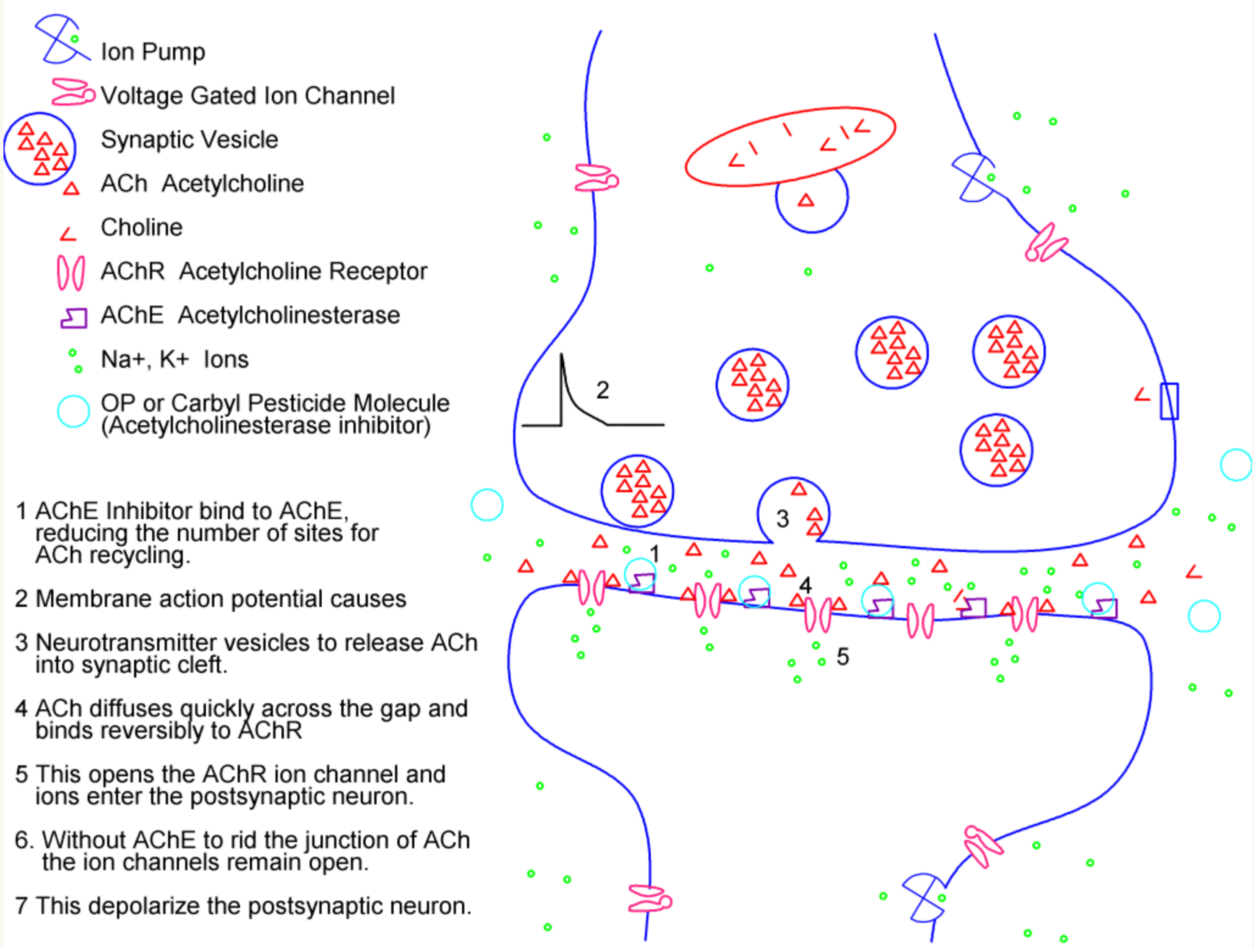
Insecticides targeting the acetylcholine pathway

There are several classes of pesticides that disrupt the acetylcholine pathway. We will start by looking at the neonicotinoids because they have the simplest mechanism, similar to the “direct action” of the pyrethroids discussed above.



The neonicotinoids bind strongly to the AChRs. Binding causes he ion channels to open so Na+ ions can flow into the neuron. Unlike the normal acetylcholine response where the channel is only open for about a millisecond, when the neonicotinoid binds the receptors never close. Hence, it takes only a relatively few open channels to eventually depolarize the neuron. If the ion pumps cannot keep up with the leakage through the nicotinoid-bound AChRs the cell will depolarize. Partial depolarization will make the neuron more excitable; complete depolarization leads to paralysis.

This situation is more complicated with acetylcholinesterase inhibitors such as the organophosphate and carbaryl insecticides. For these chemicals, the insecticide does not directly bind to neuronal receptors that open ion channels. Instead the chemicals bind to the acetylcholinesterase (AChE) enzymes which rid the synaptic junction of the ACh neurotransmitter that is released with normal activity. However, without the AChE to clear the junction, the ACh continues to bind with AChR ion channels. The figure below shows schematically what happens with these AChE inhibitors.



Insecticide molecules bind to the acetylcholinesterace (AChE) sites in the synaptic junction, preventing the naturally released ACh for being removed and recycled from the junction. The acetylcholine continues to activate receptors, keeping their channels open thereby depolarizing the post synaptic neuron. Again, poisoning symptoms begin with an over-excitable nervous system, characterized by uncontrolled twitching, similar to the other classes of neurotoxins we have looked at.

Neurotoxins are among the most potent biological chemicals known. The chemicals are targeted to interact with specific receptor molecules that are crucial for nervous system function. This means that very few pesticide molecules are required to have a large biological effect. Chemicals used as pesticides need to effectively poison target species while remaining benign to non-target organisms and humans. However, much of the cellular machinery is shared across the animal kingdom, so differentiating between target and non-target organisms is a challenge. Often only space and time are used to separate target and non-targets creatures from chemical exposure. The environmental effects of pesticide chemicals depends upon the success of various strategies to limit harmful exposure to non-target species. In many cases dilution is the solution, but as industrial agriculture and residential uses of potent chemicals become even more widespread, minute residual levels of toxins is inevitable. Next time we will see why this is more likely to be a problem with some classes of chemicals more than others.

See Threshold mechanisms in acetylcholine pathway insecticides and environmental safety

Threshold mechanisms in acetylcholine pathway insecticides and environmental s afety

Gary RondeauDecember 3, 2017Beekeeping, Ideas, Pesticides, ToxicsEdit"Threshold mechanisms in acetylcholine pathway insecticides and environmental safety"

Post navigation

Previous
Next

Overview

Previously we looked at some of the basic principles of nervous system function and how chemicals from several pesticide classes disrupt normal function. This time we will look in detail about what we can expect for a dose-response characterization of acetylcholine pathway insecticides based upon their mode of action and properties of the nervous system. This will get a little more technical than usual. The casual reader may want to skim over the equations but think about the explanations.

Several families of pesticides function by disrupting the synaptic acetylcholine pathway. Organophosphate pesticides and the carbamates block the enzyme acetylcholinesterase (**AChE**) such that the naturally released neurotransmitter, acetylcholine (**ACh**), is not broken down and recycled. Instead **ACh** builds up in the synaptic junction and over-stimulates the acetylcholine receptors (**AChR**) on the post-synaptic membrane.

The neonicotinoids act directly by bonding strongly to the nicotinic acetylcholine receptors (**nAChR**) in a manner that holds open the receptor ion channel.

Both classes of chemicals, the **AChE** inhibitors and the **nAChR** agonists, produce excessive numbers of activated acetylcholine receptors on the post synaptic membrane, which gives rise to a reduction in the post synaptic resting potential and a propensity to generate action potentials in the post synaptic neuron. Acute poisoning occurs when the general level of neural stimulation is sufficient to disrupt the normal physiological processes required to sustain life. Clinically, insects and animals poisoned with either class of chemicals are seen to lose muscular control, exhibit uncontrolled twitching, eventual paralysis, and death.

We will begin by considering a single synapse and come up with a relationship for the post synaptic stimulation as a function of the fractional lethal chemical level. We will also consider implications of acetylcholinesterase disruption for an entire neural network. Finally we will seek to understand the environmental implications of threshold versus non-threshold action with these chemicals.

Synaptic electro-chemical function

The nervous system is governed by neuronal generated “action potentials”, rapid electrical potential changes that travel rapidly along the neural axons and terminate in the branching tree of dendrites at synapses where they can cause the release of neurotransmitter into the synaptic cleft. The neurotransmitters rapidly diffuse across the synaptic junction and attach to receptors on the post-synaptic membrane. These transiently bound receptors change the permeability of the membrane and allow ion currents to flow across the membrane, thus altering the local cellular electrical potential in the post-synaptic neuron.

Action potentials are fast transients that last 1-3 milliseconds. Diffusion time of **ACh** across the junction is faster, measured in microseconds, and the decay of synaptic free-circulating **ACh** is normally around one millisecond. The time response of the excitatory post-synaptic potential is slightly slower, typically lasting several to 10’s of milliseconds.(1) This allows the post-synaptic neuron to be the summing junction from many synaptic inputs, doing some kind of dynamic averaging that determines whether or not the downstream neuron will produce its own action potential. We argue that changing the decay time of **ACh** in the synaptic junction relates directly to stimulation that will produce an action potential in the downstream neuron. Roughly, doubling the decay time is likely to double the likelihood of the downstream neuron generating its own action potential because the amount of post-synaptic charge transfer will be proportional to the length of time **ACh** holds open the **AChR** receptors, and this open time is within the typical averaging period of the neuron.

Acetylcholinesterase Inhibitors – Consider a single synapse

A normal stimulus, S_0, produced by a single action potential in the downstream neuron can be written as

[1] $$S_0 = kN_R N_A \tau_A$$

Where N_R is the concentration of **AChR**s, N_A is the concentration of **ACh** released by the action potential, k is a proportionality constant and τ_A is the lifetime of **ACh** in the synaptic junction.

The primary way acetylcholinesterase inhibitors act is by reducing the number of **AChE**molecules available to catalyze the destruction of **ACh** in the synaptic junction. It is reasonable to expect that decreasing the number of available **AChE** molecules will proportionally increase the time it takes for **ACh** molecules to be degraded. If we assume that a fraction, f, of the **AChE** is bound with inhibitor, then we estimate the ACh lifetime,τ, in the presence of **AChE** inhibitor as

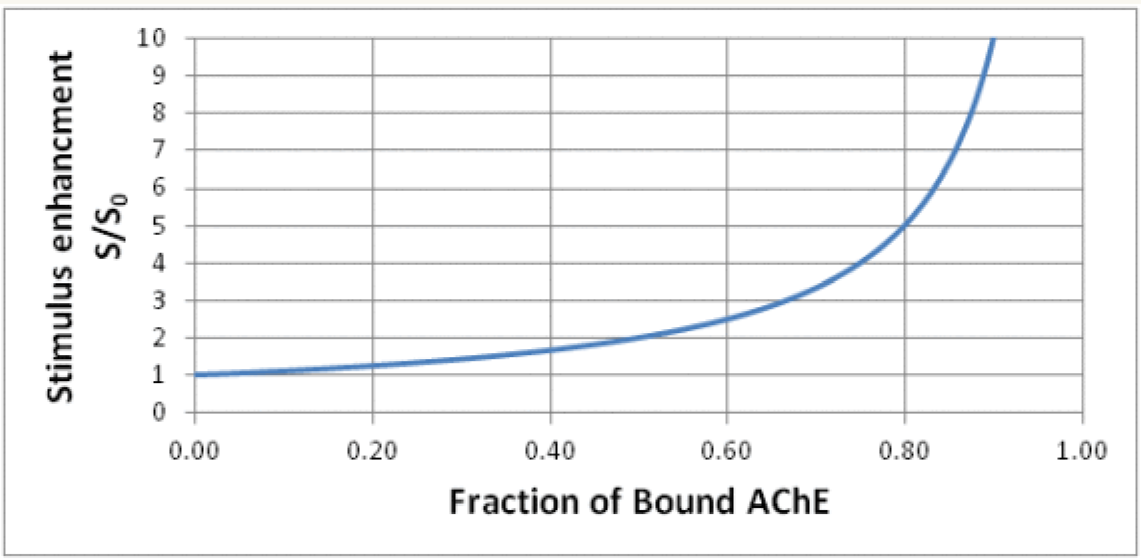
[2] $\tau = \tau_A / \left(1 - f\right)$

For a single action potential neither N_R nor N_A are affected by the **AChE** inhibitor, so we can express the excess stimulus as a function of the fraction of inhibited **AChE** as

[3] $S = S_0 \left(1 - \frac{1}{(1-f)}\right)$

As f increases, eventually the excess stimulus is lethal which we designate as S_L, occurring at f_L.

[4] $S_L = S_0 \left(1 - \frac{1}{(1-f_L)}\right)$



The graph shows what happens as the fraction of bound **AChE** increases. The stimulus enhancement rapidly gets large as most of the **AChE** becomes unavailable to catalyze the destruction of **ACh**.

With a little algebra you can show that the fraction of excess stimulation at the sub lethal limit compared to lethal over-stimulation can be expressed as

[5] $\frac{S_\epsilon}{S_L} = \epsilon \left(1 - f_L\right)$

Where $\epsilon = f/f_L << 1$ is the sub-lethal exposure as a fraction of the lethal level, and S_ϵ is the excess simulation associated with the small dose ϵ.

Example: If the lethal stimulus level is five times the normal background level of neuronal activity, then 80% of the **AChE** must be bound. If we ask what happens with an exposure that is 10% of the lethal level, (8% of **AChE** bound) then the increase in simulation is only 1.6% of the increase needed for lethality. In the residual limit, the stimulus increase is less-than-linear with exposure, with this "safe residual" effect strongest for chemicals where f_L approaches 1.

Studies with fish have shown that **AChE** inhibition levels need to be 60% to 90% (2), depending upon the chemical and species, to be lethal. This is more or less in accord with this model where lethality requires most of the **AChE** receptors to be out of commission, and would suggest that toxicity suppression for residual levels would be significant for these chemicals.

Acetylcholine Dynamics – Consider the complete network

Now we will take the nervous system as an ensemble of neurons with average properties. Specifically we are interested in the acetylcholine pathway, so we define several global average quantities and relationships between them. Acetylcholine activates receptor sites on the post synaptic membrane that stimulate the post synaptic neuron. We can express this globally averaged stimulus, S_{ACh}, as

[6] $$S_{ACh} = kN_{ACh}N_R$$

where k is a proportionality constant, N_{ACh} is the average concentration of synaptic acetylcholine, and N_R is the concentration of acetylcholine receptor sites. (Unlike the previous section, here N_{ACh} is an averaged network concentration, whereas N_A in Equation [1] described the total release of **ACh** caused by a typical action potential.) Acetylcholine is release into the synaptic junction by action potentials from stimulated neurons. It is then quickly degraded by acetylcholinesterase receptors located in the synaptic cleft. We can express this relationship as

[7] $$\frac{dN_{ACh}}{dt} = k'S_{ACh} - k_E N_{ACh} N_E$$

Where k' reflects the efficiency of the averaged stimulus at generating additional **ACh** due to stimulus-induced action potentials. N_E is the concentration of **AChE** that degrades **ACh** and k_E is a constant involving the efficiency for **AChE** destruction of **ACh**. Combining [6] and [7] and defining $kk' \equiv k_R$, we get

[8] $$\frac{dN_{ACh}}{dt} = (k_R N_R - k_E N_E)\, N_{ACh}$$

A solution of the differential equation is

[9] $$N_{ACh} = N_{ACh0}e^{t/\tau}$$

Where the growth rate, τ is

[10] $$\tau = 1/\left(k_R N_R - k_E N_E\right)$$

The growth rate, τ, must be negative or acetylcholine concentration will grow without bounds,

[11] $$N_E > \frac{k_R}{k_E} N_R$$

Hence, under normal conditions, the concentration of **AChE** must be sufficient to prevent runaway growth of the **ACh** concentration due to **ACh**'s ability to generally stimulate the neural network. Here we are not considering the many other neurotransmitters, both agonists and inhibitors, that are included in the network, nor are we considering external inputs. However, conditions that place the entire network in a rough dynamic balance enhance the network's ability to involve multiple neurons for information processing. Hence, one might suspect that the inequality [11] is only weakly maintained, at least in some portions of the neural network since this would lead to a network that would more optimal for information processing .

The complete network with AChE Inhibitors

Now let us consider what happens when we add **AChE** inhibitors and to this picture. The effect of chemical **AChE** inhibition will be to reduce the natural concentration **AChE**, N_{E0}, to an available active component

[12] $$N_E = N_{E0}(1 - f)$$

where f is the fraction of bound **AChE** receptors. Substituting [12] into [11] and solving for f, we find that there is a critical inhibition fraction that will result in uncontrolled growth of the ACh concentration.

[13] $$f_{Crit} = 1 - \frac{k_R N_R}{k_E N_{E0}}$$

One might consider this the threshold level at which AChE pesticides produce a lethal effect.

In the medical literature on OP poisoning, one comes across the notion of "cholinergic crisis" which suggests such a threshold-like condition (3). Although experimentally it is found that relatively large fractions of the AChE must be inhibited to cause lethality, this network effect may play the role of the coup de grâce at the entire organism level.

Acetylcholine Receptor Agonists – Neonicotinoids

The acetylcholine receptor agonists such as the neonicotinoids will directly stimulate the post synaptic neuron. We can write the postsynaptic stimulation, S_{Nic}, due to the neonicotinoid as

[14] $$S_{Nic} = j_C f N_R$$

Where j_C is the single-receptor ion current stimulation, N_R is the **nAChR** concentration and f is the fraction of receptors bound with agonist. When only a few receptors are bound with agonist, the cell's ion pumps will attempt to restore the resting potential of the neuron. However, ion pumps are a slow energy-intensive process. Compared to an open **nAChR**channel, as a rough estimate, an ion pump will only generate ~10^{-5} as much current.(4) Put another way, for each open **nAChR** there needs to be ~ 10^{5} ion pump channels in action to keep the cell in homeostasis. A normal functioning **nAChR** would remain activated only for a few milliseconds at most, so much less pumping is required to recover from normal activity because of the low synaptic duty cycle.

No obvious threshold mechanisms are present for this class of chemical. Instead, the excess stimulation is directly proportional to the amount of bound receptors, which is itself proportional to insecticide dose. If we go through the exercise like we did for equation [5] we discover that in the residual limit where $\epsilon << 1$,

[15] $$\frac{S_\epsilon}{S_L} = \epsilon$$

showing the stimulus is proportional to the residual dose.

Metabolic load for residual levels of these chemicals

Any depolarization of the post-synaptic neuron must be eventually be rectified by metabolic processes that pump ions uphill against the gradient to return the neuron to its normal resting potential. Chemicals that increase the post-synaptic stimulation beyond the natural level will require proportionately more metabolic effort to return the neuron to its resting potential. For the **AChE** inhibitors the excess stimulation is only operative when the synapse is stimulated by the action potential and **ACh** is present. If we wish to find an averaged excess stimulation of the post synaptic neuron, we need to multiply the instantaneous excess stimulation by the synaptic duty cycle, D. We can rewrite equation [5] for the averaged excess stimulation for a residual quantity of **AChE** inhibitor, ϵ_{OP} as

[16] $\langle S_{\epsilon_{OP}} \rangle = \epsilon_{OP}\left(1 - f_L\right) D S_{L_{OP}}$.

For the neonicotinoids, the stimulation is constant, with duty cycle equal to one when doing the time averaging.

[17] $\langle S_{\epsilon_{NN}} \rangle = \epsilon_{NN} S_{L_{NN}}$

If we assume that chemical pesticides are applied in the field at rates that are designed to produce a lethal effect in target organisms, then we can compare the relative effects of residual levels of the chemicals $\epsilon = \epsilon_{OP} = \epsilon_{NN}$, some small fraction of the lethal level, by normalizing to an application rate where $S_{L_{OP}} = S_{L_{NN}}$. Here the subscripts OP and NN refer to the organophosphate or neonicotinoid classes of chemicals respectively. With these assumptions, combining [16] and [17],

[18] $\frac{\langle S_{\epsilon_{OP}} \rangle}{\langle S_{\epsilon_{NN}} \rangle} = \left(1 - f_L\right) D$

The above comparison suggests that for similar residual levels of the two classes of chemicals, the neonicotinoids will produce a much larger average post-synaptic stimulation. We can make estimates for the synaptic duty cycle based upon observed average firing frequency, ~1 Hz, and typical action potential duration, ~2 ms. If we assume the threshold term $\left(1 - f_L\right) = 0.5$, then taken together the neonicotinoid chemicals will produce ~1000 times more averaged post-synaptic stimulation than would similar residual levels of organophosphate pesticides. For sub lethal doses of the pesticides, where nervous system function is not strongly impaired, the primary physiological effect one would expect to see would be a much higher metabolic drag on the organisms exposed to low levels of neonicotinoids.

Time Cumulative Effects

The time history of the the movement of the pesticide from its initial application, its interaction with target or non-target organisms, and its eventual dilution and degradation can have dramatic consequences in terms of both acute initial toxic effect and latent residual toxic effect.(5) An effective and safe pesticide should strongly attack the target organism yet remain benign to similar species that are *not* the target organisms. The best way to achieve a strong differentiation from initial application compared to residual pollutant is to use chemicals that have all of the following properties:

1. Rapidly degrade in the environment.
2. Rapidly disassociate at targeted biological binding sites.
3. Have a strong threshold action.

Lets look at these in turn. Persistent chemical pollutants have been the bane of the pesticide industry since DDT. None of the acetylcholine path insecticides are as bad as the organochlorines, but there is still quite a difference between members of this group. The neonicotinoids are said to have around a 1 year soil life, but experience suggests that to be an optimistic number. Where the chemicals have been used for many years, the contamination levels continue to increase. Since the neonicotinoids are water soluble, this suggests that what may appear as degradation is merely dilution and migration. Instead of the chemical disappearing, we find contamination far from the source of the application. (6,7,8) Chemicals that are persistent in the environment long after the crop is harvested and target insects are gone can only have deleterious consequences for unintended organisms. The severity of the consequences depends on the final two properties.

Insecticide chemicals that bind to targeted receptors can have a wide range of receptor affinity and binding strength. Chemicals that bind transiently (like the **ACh** molecule itself to **AChR**s) will remain in quasi chemical equilibrium with the extracellular fluid and will bind to target molecules at a rate that is proportional to the concentration of the chemical. However, some insecticide chemicals are designed to bind tenaciously to the desired receptor sites. In these cases, the molecules will become trapped at the target site even after most of the chemical has been rid from the organism's body by metabolic processes. In cases with very strong target binding, one can expect accumulation over time of molecules at the target sites as long as there is any continuing exposure to the chemical. How serious a problem this will be for non-target organisms depends on the last property, whether the chemical works with a threshold action or not.

Properties of Pesticide Classes

Chemical neuro-toxic pesticides have been widely used for more than 70 years. During that time several families of chemicals have been developed to target specific neurological receptors. The chart below lists several of these classes, includes a common example or two from each class and shows typical properties of these chemicals.

Pesticide Class	Example Chemical	Oral LD50 Honey-bees	Typical Soil half-life	Typical metabolic half-life	Typical binding dissocia-tion time	Typ. tox. time-scaling exponent	Toxic Mechan-ism	Comment
Neonic-otinoids	Imidacloprid	50 ng/bee	.5 – 3 yr.	4 hr.	>10 days	2	Synaptic nAChR agonist.	Often used as systemic insecticides
	Thiameth-oxam	20 ng/bee	30-300 days	2-6 hr. (rats)	?	2	Irreversible binding	Direct acting on nAChRs
Pyrethroids	Delta-methrin	60 ng/bee	11-72 days	2 hr.	Several seconds	2 ?	Keeps open voltage gated Na+ ion channels on axon	Direct acting on Na+ channels
Organo-chlorines	DDT	6190 ng/bee	2-15 yr.	6 yr.	Temperture dependant-- suggests less than a second.	?	Keeps open voltage gated Na+ ion channels on axon	Most of these chemicals have been banned by international treaty as persistent organic pollutants
	Dieldrin	133 ng/bee	5 yr.	9-12 mo. humans		?		
Organo-phosphate	Diazinon	370 ng/bee	15-200 days	17 hr.	16 days	1 ?	Irreversible AChE inhibitor	AChE inhibitors have inherent "threshold" action. A large fraction of AChE must be bound to have toxic effect
	Malathion	720 ng/bee	1-15 days	12 hr.	? days	0.5 (fish)		
Carbamates	Carbaryl (Sevin)	1540 ng/bee	4-30 days	8 hr.	short	1	Reversible AChE inhibitor	Indirect acting on ACh

It is worth looking at the typical chemicals in the table above in light of the requirements we identified as desirable for a safe pesticide. Note that the organochlorines failed badly because they were so persistent in the environment to the point they have been almost universally banned. They were largely replaced by the organophosphates with which we've continue to have an uneasy coexistence for the last half-century. Under scrutiny because of their potent effects on humans and other vertebrates, many of the organophosphate insecticides are being forced into retirement. The replacement has been the neonicotinoids, which have the benefit of relative specificity to invertebrate **nAChR** receptors making the chemicals less toxic to humans and other vertebrates. Unfortunately, the neonicotinoids fail with regard to all three of the properties for safe and effective pesticides.

From our discussion you can see that the safest chemicals are the carbamates. Typically it takes more chemical (compare LD50 for neonicotinoids, organophosphates, and carbamates) to kill the target insect, but the persistence of the chemical in the environment is short. It is metabolized relatively quickly, and acts reversibly with the target receptors. Finally, it is also an **AChE** inhibitor that has a strong threshold of action effect. Compare this with the neonicotinoids at the top of the chart. It takes much less neonicotinoid chemical to kill, but this is likely due to its tenacious persistence on the target receptor sites. The chemicals do not degrade very quickly in the environment so they will continue to accumulate on target and non-target organism synaptic receptors long after the initial application. And finally, the neonicotinoids produce toxic effects at residual dose levels, unlike the **AChE** inhibitors. All of the tricks we have in the playbook to segregate between target and beneficial insects fail with the neonicotinoids.

Implications of threshold action for toxicity scaling

Change of sign of the acetylcholine growth rate provides a clear qualitative turning point for the organism. It is easy to understand how such a runaway event can lead to death. Hence, if you wish to model the toxicity scaling of a compound with such a distinct threshold action, all you have to do is follow the movement of toxin to receptor sites until the threshold is reached. This will naturally give you Haber's rule for substances that accumulate, such as most of the organophosphate insecticides. For insecticides that don't accumulate on receptors, such as carbamates, one would expect threshold action without a significant time dependence. Once pesticide concentrations reached levels where chemical equilibrium at receptor sites resulted it enough bound **AChE** to change the sign of the **ACh** growth rate, the threshold condition would be reached. However, at small residual concentrations of acetylcholinesterase inhibitors, the molecules disable a few AChE sites and hence slightly change the synaptic response, but otherwise remain largely benign to the organism. For this class molecules, there is a very large change in toxic effect with concentration. Despite the continued environmental issues and concerns with organophosphate pesticides, it should be recognized that they may be intrinsically environmentally safer because of their strong threshold action than the newer neonicotinoids.

For the neonicotinoids where there is no distinct threshold condition, the situation is more complicated. The transition from alive to dead is not accompanied by a convenient mathematical marker like the change in sign of a growth rate. Especially at the residual limit, we are left to speculate on the physiological impact of accumulate insults from the toxic chemical. Single molecules will open ion channels and begin to depolarize neurons. This abnormal state of affairs would be countered by energy-burning processes in the organism to mitigate the dysfunction. This is the definition of stress. It is likely that the residual-level stresses to non-target organisms is the Achilles' heal for the neonicotinoid insecticides. Very low concentrations of these pesticides have the potential to switch on compensatory physiological processes that are poorly understood, but likely stressful. One example was the discovery that very low levels of the neonicotinoid clothianidin reduced the immune response of honeybees to the point where deformed wing virus could replicate. Low levels of the acetylcholinesterase inhibitor chlorpyriphos, the molecules of which in our understanding would be rather benignly latched on to a few of the **AChE** sites, showed no such immune suppression effect.(9) The fact that **nAChR** channels are involved in less well studied immune system and cellular signaling functions adds to the risk that disrupting these pathways will have unintended consequences.(10,11)

A key point is that at residual levels, **AChE** inhibitors are really doing nothing. A small fraction of the **AChE** sites my be out of commission, but even that effect is only apparent when the neuron fires and there is **ACh** to be swept away. During the neuron's quiet state the pesticide molecules are benign. Contrast this situation with what happens on the postsynaptic membrane with a few neonicotinoid molecules. Single neonicotinoid molecules hold open **nAChR** channels that will tend to depolarize the neuron. This happens even when the neuron is in an un-stimulated state. However, given the persistent depolarization by the open channel, it can't rest. Instead the cell must muster energetic processes in an attempt to restore the neuron's polarization so that it may still function.

Besides suppression of immune response as mentioned above, there are likely other detrimental effects from the energy sapping response required by residual neonicotinoid poisoning. Trade-offs between energy expenditures to maintain neurological function and more normal activities such as powering flight muscles may explain some of the observed effects of chronic low level exposure. (12) Another study shows epi-genetic changes to imidacloprid-exposed honeybee larva that that strongly affects genes involving metabolism. (13) The myriad effects that low level neonicotinoid exposure presents, such as impaired navigation, poor learning ability, reduced flight time, and immunological impairment may be better understood from the perspective of the metabolic stress caused by open nAChR channels than by direct neurological impairment.

(1) Fetz EE, Gustafsson B. Relation between shapes of post-synaptic potentials and changes in firing probability of cat motoneurones. *The Journal of Physiology*. 1983;341:387-410.

(2) Bryan Ballantyne and Timothy C. Marrs., *Clinical and Experimental Toxicology of Organophosphates and Carbamates*, Published 1992 by Butterworth-Heinemann.

(3) Waseem M, Perry C, Bomann S, Pai M, Gernsheimer J. Cholinergic Crisis after Rodenticide Poisoning. *Western Journal of Emergency Medicine*. 2010;11(5):524-527.

(4) Gadsby DC. *Ion channels versus ion pumps: the principal difference, in principle.* Nature reviews Molecular cell biology. 2009;10(5):344-352.

(5) Rondeau G, Sánchez-Bayo F, Tennekes HA, Decourtye A, Ramírez-Romero R, Desneux N. 2014 *Delayed and time-cumulative toxicity of imidacloprid in bees, ants and termites*. Sci. Rep. 4.

(6) Main AR, Headley JV, Peru KM, Michel NL, Cessna AJ, Morrissey CA (2014) *Widespread Use and Frequent Detection of Neonicotinoid Insecticides in Wetlands of Canada's Prairie Pothole Region*. PLoS ONE 9(3): e92821.

(7) Kathryn L. Klarich, Nicholas C. Pflug, Eden M. DeWald, Michelle L. Hladik, Dana W. Kolpin, David M. Cwiertny, and Gregory H. LeFevre, *Occurrence of Neonicotinoid Insecticides in Finished Drinking Water and Fate during Drinking Water Treatment,* Environmental Science & Technology Letters ***2017*** *4 (5), 168-173.*

(8) Sadaria AM, Supowit SD, Halden RU. Mass Balance Assessment for Six Neonicotinoid Insecticides During Conventional Wastewater and Wetland Treatment: Nationwide Reconnaissance in United States Wastewater. *Environmental Science & Technology*. 2016;50(12):6199-6206.

(9) Di Prisco, G. *et al.* *Neonicotinoid clothianidin adversely affects insect immunity and promotes replication of a viral pathogen in honey bees*. *PNAS* **110**, 18466–18471, (2013).

(10) Zdanowski R, Krzyżowska M, Ujazdowska D, Lewicka A, Lewicki S. *Role of α7 nicotinic receptor in the immune system and intracellular signaling pathways*. Cent Eur J Immunol. 2015;40(3):373-9.

(11) Pamminger T, Botías C, Goulson D, Hughes W.O.H. *A mechanistic framework to explain the immunosuppressive effects of neurotoxic pesticides on bees*. Functional Ecology; 2018; 32(8):1921-30.

(12) Tosi S., Burgio G., Nieh J.C. A common neonicotinoid pesticide, thiamethoxam, impairs honey bee flight ability. (2017) *Scientific Reports*, 7 (1) , art. no. 1201.

(13) Derecka K., Blythe M.J., Malla S., Genereux D.P., Guffanti A., Pavan P., Moles A., Snart C., Ryder T., Ortori C.A., Barrett D.A., Schuster E. and Stöger R., 2013. *Transient exposure to low levels of insecticide affects metabolic networks of honeybee larvae* PLOS ONE. 8(7):e68191.

OREGON VETERINARY
medical association

March 26, 2019

RE: House Bill 3058
House Committee on Agriculture & Land Use

Dear Chair Clem, Vice-Chair McLain, Vice-Chair Post and Committee Members:

According to House Bill 3058, the Oregon Department of Agriculture must list a pesticide that contains a neonicotinoid as a restricted-use pesticide under ORS 634.316. Essentially, this would restrict the use of neonicotinoid products to only licensed pesticide applicators.

This concerns us for a couple of reasons:

- Veterinarians and other employees of a practice are currently exempt from having to obtain a license as a pesticide applicator, yet language in HB 3058 might override this exemption. We don't have a clear answer on this.

- We believe the exemption for veterinarians and employees of a clinic is appropriate. In their scope of practice, veterinarians and their employees administer a limited number of flea products on patients and also sell such products to clients for treatment of animal patients in the home. However, the percentage of neonicotinoids in these flea products are miniscule and don't raise to the level of concerns noted by proponents of HB 3058 and which led to the introduction of the legislation. It appears as if veterinarians and these safe and effective flea products are caught in the middle.

We have indicated our concerns to the lobbyist for the group HB 3058, and he informed us that it is unintentional that veterinarians and their employees and related pet health products like flea treatments and collars are included – even if by implication. He assured us that at this afternoon's hearing he would be proposing an amendment to exempt us and such products from the legislation.

If the proposed amendment is adopted into HB 3058, the OVMA will be neutral on the bill. If the amendment is not accepted, however, we will be opposed to the legislation.

Sincerely,

Glenn

Glenn M. Kolb
Executive Director

1880 Lancaster Drive NE, Suite 118 • Salem, OR 97305
800/235-3502 • 503/399-0311 • 503/363-4218 fax
oregonvma.org • contact@oregonvma.org

OREGON VETERINARY
medical association

Senate Bill 853 & House Bill 3058
(Application of Flea Products in Veterinary Medicine)

SB 853 directs the Oregon Department of Agriculture to list a pesticide product that contains a neonicotinoid as a restricted-use pesticide under ORS 634.316.

Neonicotinoids are active ingredients in a variety of approved products for cats and dogs to treat fleas, ticks and other parasites. When properly applied and used appropriately, these products have proven to be safe and effective.

There are three neonicotinoid products on the market. These are available through the veterinarian, but also accessible in pet stores, farm stores, supermarkets, and outlets such as Target. A great percentage of these products can also be purchased online through websites like Amazon, 1-800-Pet-Meds and Chewy.com.

Imidacloprid is a topical product that is combined with permethrins. K-9 Advantix and Advantage Plus (Bayer Animal Health) are two such products that are widely available for flea treatment in dogs only. With Advantage Plus, the amount of imidacloprid in one spot-on treatment for dogs weighing between 11 – 20 pounds is 0.034 fluid ounces of the product.

Dinotefuran is the neonicotinoid in Vectra D (CEVA Animal Health). This product is for use in dogs only and treats fleas, ticks, mosquitoes and mites. The amount of dinotefuran in this topical product is between 4.0% and 8.0% by volume by weight.

Nitenpryam is the active ingredient in Capstar (Elanco Animal Health). This product is an orally-administered tablet that provides fast relief from flea infestation on cats and dogs. The size of the tablet is equivalent to that of an M 'n M. (Nitenpryam comprises about 11.0% of the tablet).

1880 Lancaster Drive NE, Suite 118 • Salem, OR 97305
800/235-3502 • 503/399-0311 • 503/363-4218 fax
oregonvma.org • contact@oregonvma.org

FOR

1

PUBLIC RECORD: This form, your verbal testimony, and materials you distribute will be posted on the Internet and accessible to the public.

WITNESS REGISTRATION

Committee Name: HAGLU

Public Hearing on: HB 3058 **Date:** 3/26/19

Please register if you wish to testify on the above-named measure/issue. ***Please print legibly.***

Name PRINT LEGIBLY	Organization or County of Residence	Check if you live more than 100 miles from this meeting.	Position on Measure For	Against	Neutral
ASHLEY CHESSER	NORTHWEST CENTER FOR ALTERNATIVES TO PESTICIDES		✓		
~~BLAKE ROWE~~	~~OR WHEAT GROWERS LEAGUE~~			X	
~~ALAN VONBORSTEL~~	~~OWGL~~	X	~~X~~	X	
~~LINDSAY COPE~~	~~MID COLUMBIA PRODUCERS~~	X	~~X~~	X	
~~CLINT CARLSON~~	~~OWGL~~	X		X	
MICHAEL SELVAGGIO	AUDUBON SOCIETY OF PORTLAND		X		
Lynne Fessenden	Glory Bee, Lane		X		
Clay Wesson	Willamette Valley Vineyards		X		
Tara Cornelisse	Center for Biological Diversity		✓		
MEGAN HORTON	MOUNT SINAI SCHOOL OF MEDICINE	X	✓		
BRUCE LANPHEAR	~~SIMON~~ SIMON FRASER UNIVERSITY	X	✓		
TYLER SMITH	EARTHJUSTICE	X	✓		
Ramon Ramirez	PCUN		✓		
Kristina Lefever	Pollinator Project Rogue Valley	X	✓		

CS001 (rev. 6/2014)

FOR

2

PUBLIC RECORD: This form, your verbal testimony, and materials you distribute will be posted on the Internet and accessible to the public.

WITNESS REGISTRATION

Committee Name: HAGLU

Public Hearing on: HB 3058 **Date:** 3/26/19

Please register if you wish to testify on the above-named measure/issue. ***Please print legibly.***

Name *PRINT LEGIBLY*	Organization or County of Residence	Check if you live more than 100 miles from this meeting.	Position on Measure		
			For	Against	Neutral
Kathleen Sullivan	Clatsop County Commissioner	X	✓		
Stacy Kraker	Oregon Organic Coalition		✓		
Shawn Donnille	MOUNTAIN ROSE HERBS		✓		
Lisa Arkin	Beyond Toxics		✓		
Bear Hencel	University of Oregon		✓		
Jonathan Manton	Native Fish Society OOC, Manton Blue Hills		✓		
Matt Lawrence	Sierra Club		✓		
Nadine Basile	Sofer Vineyards		✓		

AGAINST

1

PUBLIC RECORD: This form, your verbal testimony, and materials you distribute will be posted on the Internet and accessible to the public.

WITNESS REGISTRATION

Committee Name: HAGLU

Public Hearing on: HB 3058 **Date:** 3/26/19

Please register if you wish to testify on the above-named measure/issue. ***Please print legibly.***

Name *PRINT LEGIBLY*	Organization or County of Residence	Check if you live more than 100 miles from this meeting.	Position on Measure: For	Against	Neutral
Roger Beyer	Marion			✓	
Brenda Frketich	Marion			✓	
Michelle Armstrong				✓	
Larry Bailey	Multnomah CFB			✓	
Dustin Welters				✓	
Gary Vachter				✓	
Marie Bowers	Lane			✓	
Leigh Geschwill				✓	
Debbie Crocker	Benton			✓	
Emily Woodcock	Benton			✓	
Colin Crocker	Benton			✓	
Roger Batt	Pacific Seed Assoc. / Inland Eastern - Oregon Seed Assoc.			✓	
Blake Rowe	~~[illegible]~~ Oregon Wheat Growers			✓	
Alan VonBorstel	~~[illegible]~~ OWOL	X		✓	
Lindsey Cope	~~[illegible]~~ Mid Columbia Producers	X		✓	
Clint Carlson	OWOL	X		✓	

CS001 (rev. 6/2014)

TOP

AGAINST

2

PUBLIC RECORD: This form, your verbal testimony, and materials you distribute will be posted on the Internet and accessible to the public.

WITNESS REGISTRATION

Committee Name: HAGLU

Public Hearing on: HB 3058 **Date:** 3/26/19

Please register if you wish to testify on the above-named measure/issue. ***Please print legibly.***

Name *PRINT LEGIBLY*	Organization or County of Residence	Check if you live more than 100 miles from this meeting.	Position on Measure For	Against	Neutral
Katie Fast	OFS			✓	
Jenny Dresler	Farm Bureau			✓	
Lucas Rue	Marion			✓	
Dallin Brooks	Western Wood Preservers Institute			✓	
Denns Roth	Valley Agronomics			✓	

From:	Hilary McDonald
To:	Exhibits HAGLU
Subject:	HB 3058
Date:	Friday, March 22, 2019 2:38:08 PM

I am writing to support HB 3058, which regulates the pesticide chlorpyrifos (already banned in Hawaii and other countries) and places pesticide products containing neonicotinoid on the list of restricted-use pesticide list.

Time is overdue to take a scientific look at the public costs of the use of toxic pesticides that harm people and the environment.

As a mother of a kindergartener as well as someone who cares about nature, I am very concerned about Chlorpyrifos, which is a neurotoxic pesticide. It is very harmful to children and linked to developmental disabilities, reduced IQ and memory issues. It is also dangerous to pregnant women, farm workers, wildlife and beneficial insects.

Just as bad, Neonicotinoid pesticides have been proven to be an environmental disaster for ecosystems, especially for our drastically declining pollinators. They can persist in the environment many years after their application and are highly toxic to bees, beneficial insects, fish and birds. They are also harmful to people.

I urge the Oregon Legislative Assembly to add these bee-killing pesticides to Oregon's list of Restricted Use Pesticides.

Our Oregon cities are stepping up to say no to pesticides in public places (for example see cities such as Talent and the Non Toxic Rogue Valley initiative); it's time for the State of Oregon to show leadership on this for the good of the public and the environment.

My best,
Hilary McDonald
Medford, Oregon

From: Jackie Hammond-Williams
To: Exhibits HAGLU
Subject: Re: Please listen to farmers!
Date: Monday, March 25, 2019 5:14:05 PM

Hi Shelly, so sorry! It's HB 3058 and SB 853

Dear Chair Clem,

Many farmers I know do not use Chlorpyritos or Neonics. They don't because they care about our pollinators and earthworms, without who we could not grow healthy foods. Please vote to take off the 'table' the Chlorpyrifos completely and restrict (better still ban) Neonics.

Sincerely,

Jackie Hammond-Williams
14422 Holcomb Blvd
Oregon City, OR 97045
info@orcityfarmersmarket.com

On Mon, Mar 25, 2019 at 5:07 PM Exhibits HAGLU <HAGLU.Exhibits@oregonlegislature.gov> wrote:

> Hello, Jackie.
>
> To have your comments submitted for the record and posted on OLIS please specify the bill number they should be attributed to.
>
> Respectfully,
>
> SHELLEY RASZKA | Executive Support Specialist | Senior Committee Assistant

-----Original Message-----
From: Jackie Hammond-Williams <info@orcityfarmersmarket.com>
Sent: Monday, March 25, 2019 7:36 AM
To: Exhibits HAGLU <HAGLU.Exhibits@oregonlegislature.gov>
Subject: Please listen to farmers!

Dear Chair Clem,

Many farmers I know do not use Chlorpyritos or Neonics. They don't because they care about our pollinators and earthworms, without who we could not grow healthy foods. Please vote to take off the 'table' the Chlorpyrifos completely and restrict (better still ban) Neonics.

Sincerely,

Jackie Hammond-Williams

14422 Holcomb Blvd

Oregon City, OR 97045

info@orcityfarmersmarket.com

--

Please note new email address - info@orcityfarmersmarket.com

Jackie Hammond-Williams
Manager
Oregon City Farmers Market
orcityfarmersmarket.com
503 734-0192

Oregon Seed Association Opposes HB 3058

Responsible use of pesticides is needed to stay competitive in a global market

The Oregon Seed Association (OSA) is a non-profit agricultural trade association representing the interests of Oregon's world-renowned seed industry. With a demand from overseas markets, Oregon developed a thriving seed industry that has remained a viable part of the state's economy for over 90 years. OSA was organized in 1969 and includes members that vary in size from small seed dealers to some of the largest in the world.

Members of the OSA spend close to $11 million annually developing new varieties for the domestic and world market. This research and development is focused on environmental characteristics, such as drought, shade, and disease resistance. OSA members distribute Oregon-grown grass and specialty seeds to more than 50 countries on six continents, contributing to $180 million in international trade.

In order to remain competitive in the growing global market, seed coming from Oregon must meet strong phytosanitary requirements to enter many of the foreign markets to which we export. The use of neonicotinoids by commercial application ensures that we can meet the demands of these strong standards in the world market. HB 3058 has the potential to vastly harm our ability to compete globally by limiting the products available for our use. As an alternative, however, requiring that anyone using a product with neonicotinoids must obtain a license for restricted use pesticides will ensure that they are used properly.

Of equal importance to specialty seed growers is the need of chlorpyrifos for the use in production of crops to ward off pests that potentially can destroy entire crops. Currently, there are some alternatives to treat for some of these pests, but the cost is a minimum of $100 per acre, which cuts into profit margins and limits our ability to compete on the global market.

Bees and other pollinators are very, very important to the production of our seed and food crops. As an industry, we take it very seriously that they should be protected through the proper use of pesticides. We understand the need for responsible stewardship when using pesticides and would ask that the state look at ways to inform and educate rather than ban and restrict products that are vital to the production of Oregon's agricultural crops.

Thank you,

Jake Stockfleth
President
Oregon Seed Association

To: Senate Committee on Environment and Natural Resources
From: Janaira Ramirez, Coalition Organizer
Re: SB 853 and HB 3058

Date: March 26, 2019

Dear Committee Chair Clem, Vice Chair McLain, Vice Chair Post, and Members of the Committee:

Thank you for allowing testimony. My name is Janaira Ramirez and I am the Coalition Organizer for the Oregon Just Transition Alliance (OJTA). OJTA is a network of base-building, frontline-led organizations across Oregon, who came together to envision and advocate for a just transition to a regenerative economy, centering the voices of the communities who are most impacted by environmental racism, economic exploitation, and climate change.

A just transition ensures that those who grow and harvest the food that nourish our bodies have the adequate protection and resources to live long and healthy lifestyles. About 300,000 farmworkers in the U.S. are poised by pesticides each year, and the average age of a farmworker in the United States is only 49 years old, compared to the 78 years for all others in the U.S. [1] Many farmworkers lack health protections and benefits which put them at a disadvantage when addressing diseases caused by pesticides spraying and the many other health concerns that emerge from the strenuous labor and work environment without proper health and work protections. Chlorpyrifos is one of the pesticides that presents a great health risk for those who grow the food we eat, due to their direct interaction with the pesticide and crop harvesting, but it also affects all those Oregonians at the end of the supply chain who consume the harvested goods on our bountiful state. Chlorpyrifos, since it is a pesticide, damages the nervous system of surrounding pests as it is indented but more importantly, it attacks the human nervous system when exposed to the pesticide.[2] Exposure to chlorpyrifos is also linked to respiratory diseases, and developmental disorders in children. [3]

Neonics, another pesticide, is known for the harmful effects on bees, soil, and its lingering accumulation in our drinking water which violates our right to clean and safe drinking water. Bees, small but mighty creatures, uphold our ecosystem and bio diversity. They pollinate 30% of the food we eat across the country but unfortunately, there has been an increasing decline in bee population over the past decades; over 25% of honey bee populations have declined since the

---

[1] “The State of Farmworkers in California” Center for Farmworkers and Families, http://www.farmworkerfamily.org/information

[2] “Chlorpyrifos General Fact Sheet.” National Pesticide Information Center, http://npic.orst.edu/factsheets/chlorpgen.html

[3] “Children's Exposure to Chlorpyrifos and Parathion in an Agricultural Community in Central Washington State.” National Institute of Environmental Health Sciences, U.S. Department of Health and Human Services, ehp.niehs.nih.gov/doi/abs/10.1289/ehp.02110549.

1990s. [4] A continuing decline in the bee population has drastic effects on our ability to adequately feed our current and growing population. As a result, there will be a drastic change in the type of crops we will be able to grow in future years. We need make sure that our soil, pollinators, and water are safe for our current health and nutritional needs but also for the needs of generations to come. Bees are responsible for many the fruits, nuts, and some of the vegetables we eat. Climate change will exacerbate the harms to the bee population and it is our duty, your duty, to ensure that the mighty creatures who make food production possible are protected.

Committee members, it is your duty as our elected representatives to ensure that farmworkers, children, the foundations of our delicate ecosystem, and all Oregonians, are protected from the harmful effects of chlorpyrifos and neonics; this calls for a state wide ban on chlorpyrifos and strict restrictions on the purchase and the methods in which neonics are used. Neither of these pesticides are safe for human health in the current way they are being employed. They do not benefit to the health of our sacred soil, drinking water, or our precious pollinators. SB 853 and HB 3058 both ensure human health is prioritized and that the food and water we consume on a daily basis to nourish our bodies are safe for all those who work and live in Oregon. I hope you support SB 853 AND HB 3058. Thank you.

Janaira Ramirez

Coalition Organizer, Oregon Just Transition Alliance

[4] "Bee Facts" National Resource Defense Council, https://www.nrdc.org/sites/default/files/bees.pdf

From:	Janice Flegel
To:	Exhibits HAGLU
Subject:	Oppose HB 3058 &SB 853
Date:	Tuesday, March 26, 2019 10:20:06 AM

Dear Chair Clem,

As a farmer we need to be able to use all the tools available to help us protect our crops in a safe manner. We follow the label directions and make sure we don’t use chemicals in an unsafe way. Even though we are being responsible legislation like this is being drafted to ban pesticides that are critical for our farm. We do not use chemicals unnecessarily. We make sure that bees are kept safe when using insecticides, because we rely on those same bees to pollinate our crops. Lastly sometimes we use these products to protect the bees from predators to keep our bees alive and thriving. Please oppose this as the unintended consequence could be dire.

Sincerely,

Janice Flegel
9271 NW McCabe Rd
Prineville, OR 97754
janice.flegel@gmail.com

From: Jeanne Roy
To: Exhibits HAGLU
Subject: HB 3058, Prohibits sale, purchase or use of pesticide chlorpyrifos
Date: Monday, March 25, 2019 1:39:34 PM

To: House Agriculture and Land Use Committee
From: Jeanne Roy
Date: March 24, 2019
Subject: HB 3058, Prohibits sale, purchase or use of pesticide chlorpyrifos

I urge you to pass HB 3058.

I was shocked when the Trump administration appealed an EPA decision and subsequent court ruling to prohibit uses of the pesticide chlorpyrifos. The organophosphate is a well-documented hazard to the nervous systems of children and wildlife. The US Court of Appeals for the Ninth Circuit in August 2018 found "no justification" for the EPA to continue allowing chlorpyrifos uses "in the face of scientific evidence that its residue on food causes neurodevelopmental damage to children."

Oregon must take action to protect its children. Under federal pesticides law, states cannot set standards less stringent than those established by the EPA, but they can establish more protective standards. Hawaii became the first state to ban chlorpyrifos. Oregon now has an opportunity to follow suit.

Jeanne Roy | Chair, Board of Directors
Eco-School Network
319 SW Washington Street, Suite 400
Portland, Oregon 97204
(503) 244-0026; www.ecoschoolnetwork.org

Testimony before the House Committee on Agriculture and Land Use
House Bill 3058, prohibits sale, purchase or use of pesticide chlorpyrifos and requires the State Department of Agriculture to place pesticide products containing neonicotinoid on a list of restricted-use pesticides
By Jeff Stone, Executive Director, Oregon Association of Nurseries
March 26, 2019

Chair Clem, Vice-Chairs McLain and Post, members of the committee, my name is Jeff Stone and I serve as the Executive Director of the Oregon Association of Nurseries. The OAN opposes House Bill 3058 – which is a misguided mandate relating to pollinators and the use of insecticides as well as the outright ban of the pesticide Chlorpyrifos.

The Economic Footprint of the Nursery and Greenhouse Industry

The nursery and greenhouse industry is the state's largest agricultural sector, and the industry ranks third in the nation, with over $948 million in sales annually to customers in Oregon, the rest of the United States, and abroad. In fact, nearly 75% of the nursery stock grown in our state leaves our borders – with over half reaching markets east of the Mississippi River. The nursery industry employs over 22,000 full time workers with an annual payroll over $327 million. We send ecologically friendly green products out of the state and bring traded sector dollars back to Oregon.

Nursery association members represent wholesale plant growers, Christmas tree growers, retailers, and greenhouse operators. Our members are located throughout the state, with our largest nursery growing operations found in Clackamas, Marion, Washington, Yamhill and Multnomah Counties.

House Bill 3058 is bad bill and would harm education-oriented retail nurseries

The OAN is concerned about the legislature placing requirements on any retailer selling neonicotinoids be a "licensed pesticide dealer." To become a licensed dealer in Oregon, you submit a fee and an application to ODA. The OAN views this bill as unfair fee for those who grow and sell nursery products.

We are opposed to requiring retail stores to obtain special certification at a fee to be able to sell products that contain neonicotinoids. The retail stores that handle these products are critical in educating the general public as to the correct and responsible use of these products and do so willingly. Imposing increased regulations and fees upon this group is unfair and uncalled for. Retailers are proactive in educating people on the benefits of bees, how to improve pollinator habitat, and the importance of responsible use of all insecticides - not just neonicotinoids.

The Nursery and Greenhouse industry is a committed leader on pollinator health
The OAN and many other organizations have been working hard over the last half decade to educate consumers and agricultural sectors, prioritize research and incentives, and bring together agricultural, beekeepers, garden clubs and conservation groups to engage on increasing the populations of native and honey bees along with monarch butterflies.

Pollinating bees are important to sustaining life on our planet. They support our food chain and many plants are dependent on bees for production. The horticulture industry is committed to ensuring their sustainability because of their important role in the life cycle of plants and humans.

The state took affirmative action in 2014 with House Bill 4139 – which created a task force of stakeholders to collaborate and create a science-based approach to pollinator health which would lead to a better solution. The "Report to the Oregon Legislative Assembly" by the Task Force on Pollinator Health was released in November 2014. Four main consensus items emerged that received the support of stakeholders. In 2015, the OAN and others advocated for the creation of three bills to enact the recommendations of the task force. They are below:

- **I.** Oregon should develop a strong, effective outreach and education strategy on pollinator health, including best management practices. (House Bill 3362)
- **II.** Oregon should fully fund a state-of-the-art bee health diagnostic facility at Oregon State University. (House Bill 3360)
- **III.** An integrated pollinator health research plan should be developed and funded to improve understanding of the many issues affecting pollinator health. (House Bill 3361)
- **IV.** A sustainable revenue stream to fund the proposed outreach, education and research programs is needed.

It is imperative that over the coming years, stakeholders roll up their sleeves and work with our land grant university (Oregon State University), legislators, and state agencies to determine the most appropriate paths forward. It is critical we work with interested parties to examine how to study this issue further and create a communication effort for the general public and industry. We all benefit when we move in a reasoned manner to evaluate trends in pollinator health, including the use of best management practices.

House Bill 3058 is unwise policy
HB 3058 would make neonicotinoids "restricted use" pesticides. This limits the purchase and use of these products to be certified pesticide applicators. This chemical class is relatively safe to both human and pollinators and is used as part of pest mitigation by our greenhouse and nursery members. The association did extensive outreach to retail, greenhouse and field grown members to increase awareness of the pollinator issue as well assess the use of the chemical class and the number of licensed pesticide applicators.

Some facts for the committee to consider:

- Neonicotinoids have been in use for more than 17 years and have been widely adopted by growers and urban applicators because of their performance, lower toxicity to mammals, including humans, and relatively favorable environmental profile over the older products they replaced.
- Restrictions on the use of neonicotinoids will force applicators to use alternatives, such as organophosphates and pyrethroids, which pose increased risks to humans and the environment.

- HB 3058 attempts to allow farmers to use neonicotinoids, but there is no program in place to identify farmers and allow them to purchase and use these products.
- These products have met the Environmental Protection Agency's high standard of having "no unreasonable adverse effect on health or the environment." This means that they have had extensive safety testing including:
    - Honeybee acute contact toxicity (all outdoor use products)
    - Honey bee toxicity of residues on foliage (if high acute toxicity and exposure likely)
    - Field testing for pollinators (specific conditions)
- EPA has stated that:
    - …the Agency is "NOT aware of any data that reasonably demonstrates that bee colonies are subject to elevated losses due to chronic exposure to this pesticide." (02/18/11); and
    - "... is NOT aware of any data indicating that honey bee declines or the incidence of CCD in the U.S. is correlated with the use of pesticides in general or with the use of neonicotinoids in particular." (07/27/12)
- EPA is engaged in registration reviews for the four major neonicotinoids. Preliminary pollinator reviews have concluded that, "most approved uses do not pose significant risks to bee colonies."

Zero tolerance on neonics lowers success rate and increases pest and disease risk
We are aware that media attention regarding pollinator health has focused on neonicotinoid insecticides and their potential impact on bees. Many of these stories provide important information for the green industry to consider and reflect upon, while others represent overstated perspectives with the intention of driving a zero-pesticide-tolerance agenda.

Research and peer-reviewed publications from trusted and legitimate sources, including those from the United States Department of Agriculture and the Environmental Protection Agency, strongly contradict the finger-pointing at neonicotinoids. Rather, the research suggests that "colony collapse disorder" of managed hives is likely caused by a combination of factors, including the destructive Varroa mite (first found in 1987), bee pathogens, loss of habitat and forage, and the constant stress of transporting hives to far-off locations by beekeepers. Pesticides may play some role in the concerns about pollinator health but are likely to be one relatively small factor in a complex array of challenges. Candidly, agriculture also depend on pesticides as tools to control destructive pests and diseases which can obliterate a market. The nursery industry wants to make sure that protecting bee health, and retaining pesticides as an effective tool, are not mutually exclusive.

For these reasons, our healthy pollinator initiative has three primary components. Our plan includes the following steps:

1. Developing a bee and pollinator stewardship program that improves the circumstances surrounding pollinator health concerns.
2. Funding research that will help us answer key science questions that support the stewardship program.
3. Spreading the word to our horticulture industry communities and our customers how the program has a positive impact on pollinators and still allows us to mitigate the spread of invasive pests that threaten our natural environment.

Nursery research initiatives underway
The Horticultural Research Institute, the AmericanHort research foundation, has released new Best Management Practices (BMPs) for Bee Pollinator Health in the Horticulture Industry.

Relevant to greenhouse and nursery growers as well as landscape managers, the BMPs were developed by a team of researchers, including those funded directly by HRI, to convey research results to date. They will be updated as the research effort continues. By following BMP guidelines, horticulture can do its part to support pollinator health.

In 2015 the Horticultural Research Institute, in collaboration with AmericanHort, launched the broad-based Horticulture Industry Bee & Pollinator Stewardship Initiative. Through the initiative, HRI directly funded four important research projects, positively influenced millions of dollars in research funding from federal and other sources, launched the Grow Wise, Bee Smart™ website, and helped to launch the Million Pollinators encompass thousands of different species, such as managed honey bees, wild bees, butterflies, birds, and bats. Protection of pollinators in general, and especially bees, continues to be a major concern among the general public and within the green industry. Several culprits have been identified as factors contributing to manage honey bee losses, including Varroa mites, other pests and pathogens, loss of habitat and nutrition, and off-target effects of pesticides. Wild, unmanaged bee populations are thought to be most affected by landscape changes and habitat degradation.

HRI developed the BMPs, which cover greenhouse and nursery production, woody ornamentals, and managed landscapes, with the assistance of researchers and apiarists throughout North America.

The Pollinator Task Force recommendations need to be fully implemented
The Oregon Legislature should give the Pollinator Task Force recommendations time to be implemented and evaluated. House Bill 2535 – a pollinator forage pilot is the most forward-looking piece of legislation on the pollinator issue introduced this session.

Opening the door on a pesticide by pesticide basis is bad policy
The second part of HB 3058 would ignore science-teams and regulators at the state and federal agency level and in its place putting legislators in a position of banning chemical classes at a whim.

Let's be clear what HB 3058 does:

- **Completely ban the sale and use of all pesticide products containing chlorpyrifos.** Effective Integrated Pest Management (IPM) tools is critical to the agricultural community and many of Oregon's specialty crops have state approved Special Local Need registrations of chlorpyrifos since there are no alternative products available for certain pests. It is critical that a safe and effective rotation of pest management tools be available.
- **Impacts Oregon exports**. Oregon agriculture competes with other states and country's for market share and they share on common objective - strong phytosanitary requirements. This legislation takes away a tool used to meet those requirements for crops with limited or no alternatives. Additionally, public health programs will not have the tools needed to control invasive insect populations.

The OAN urges the committee to oppose HB 3058
Many farmers are not currently licensed as they do not use Restricted Use Pesticides. This would require farmer to obtain a pesticide applicator license from those who properly the product and would take hundreds of effective and easy to use products away from homeowners and gardeners.

Please oppose HB 3058. Thank you for your time and attention.

From: Jen Hamaker
To: Exhibits HAGLU
Subject: Please Oppose HB 3058 & SB 853 - maintain our pest management tools
Date: Friday, March 22, 2019 8:20:07 PM

Dear Chair Clem,

HB 3058 and SB 853 are unnecessarily banning chlorpyrifos which will remove this valuable pest management tool from Oregon's farmers. Chlorpyrifos has been used in cropping systems for over 4 decades, is authorized for use in nearly 100 countries and is labelled for use on more than 50 agricultural crops. These bills put Oregon growers, who must compete in the interstate and international markets, at a significant disadvantage.

Oregon farmers grow over 225 different crops, and chlorpyrifos is a vital tool on specialty crops when there is no alternative pesticide available. Keeping this tool available is critical to controlling crop-damaging insects in Oregon's Christmas trees, vegetables, mint, and many of our crops grown for seed such as clover, radish, and perennial grass.

HB 3058 and SB 853 also unnecessarily classifies all neonicotinoid products as Restricted Use in Oregon. In order to be classified as GENERAL USE by the U.S. Environmental Protection Agency, these products are required to clearly demonstrate their safety to mammals and birds. Oregon does not have any data that justifies limiting these products to licensed pesticide applicators only. Neonicotinoid products (over 625 registered in Oregon) are currently available to any user including farmers and homeowners. Neonicotinoids have been extremely valuable in Integrated Pest Management (IPM) systems to allow selectivity in controlling harmful pests while allowing beneficial insects to thrive.

Honey bees and other pollinators are very important, not only to agriculture, but also to the gardens and landscapes that people enjoy in both urban and rural environments. Over the last several years, many steps have been taken to protect pollinators at the state and federal level. The product labels are more restrictive, and Oregon is a leader in pollinator education through Oregon State University Extension. If pesticides are used as required by the product directions, the risks to pollinators are significantly reduced. It is not necessary to put such severe restrictions on this entire class of chemicals when other ways of addressing pollinator health are working.

Please join me in opposing HB 3058 and SB 853 to maintain current pest control tools and protect Oregon crops.

Sincerely,

Jen Hamaker
88080 Heather Dr
Springfield, OR 97478
jenhamaker1@gmail.com

House Committee on Agriculture & Land Use

March 26, 2019

Oregon Farm Bureau OPPOSES House Bill 3058

The Oregon Farm Bureau Federation ("OFB") is the state's largest general agriculture association, representing nearly 7,000 families actively engaged in farming and ranching. Oregon growers are engaged in the production of over 225 agricultural products, and in many instances, are dependent on pesticide products regulated by the U.S. Environmental Protection Agency ("EPA"). OFB opposes HB 3058, which would classify neonicotinoid products as restricted use and prohibit the use of pesticides containing the active ingredient chlorpyrifos.

OFB has extensive policy regarding the safe and proper use of agriculture and forestry chemicals to ensure a reliable and high-quality supply of agricultural commodities. Our members oppose HB 3058, which puts the legislature in the role of making decisions for farmers on a product-by-product basis without the scientific background or on-the-ground knowledge to inform these decisions.

Restricting the use of neonicotinoids

Managed and native pollinators provide great benefits to Oregon farmers and consumers. Oregon farmers depend on bees to pollinate many of their crops—pears, cherries and blueberries, among others—but they also depend on pesticide tools to control destructive pests. Similarly, commercial beekeepers rely on healthy crops to optimize their pollination services. This means that Oregon farmers and beekeepers have a lot at stake and share an interest in ensuring that protecting bee health and the use of pesticides are not mutually exclusive.

HB 3058 would make over 600 Oregon-registered neonicotinoid products "Restricted Use Pesticides." This classification means that the products would only be available for purchase and use by licensed pesticide applicators. Many farmers are not currently licensed as they do not use Restricted Use Pesticides. This would require farmer to obtain a pesticide applicator license.

A "Restricted Use" designation is typically reserved for pesticide products that pose a high risk to humans or the environment. A review of the current science does not support such a designation for these products. Furthermore, the Oregon Department of Agriculture ("ODA") already has the authority to designate a pesticide product as "Restricted Use" if it determines that the product poses a high risk to humans or the environment. The experts at ODA should make these determinations, not the legislature.

All pest control options come with tradeoffs that must be considered. If neonicotinoids are taken away from a certain segment of users, those users will simply turn to other pesticides to control insects. The main alternatives to neonicotinoids are organophosphates and pyrethroids. While effective, these products come with their own sets of tradeoffs for both humans and the environment. OFB believes that when all things are considered, neonicotinoids may often be the best choice. Neonicotinoids have been lauded for their lower environmental impact than some of the products they replaced. Keeping them as an option can play an important role in an effective Integrated Pest Management ("IPM") program.

Banning chlorpyrifos

OFB recognizes the importance of applying chlorpyrifos in a safe and effective manner. As a restricted use pesticide, applications of chlorpyrifos are made by licensed applicators who are trained in the appropriate and safe use of this product. Oregon is an incredibly diverse state, and chlorpyrifos products play an important role in managing pests on nearly 100 Oregon crops—Christmas trees, sugar beets, grass seed, peppermint, and cranberries, among others. Chlorpyrifos is one of the essential tools that Oregon farmers have kept in their toolbox as an effective way to control pests. It's a tool that is used only in specific situations to address problematic pests.

With over 200 different commodities being grown in our state, Oregon is known for our rich diversity of crops. While we value this diversity, it also brings its own set of challenges. We face many unique pest pressures which often have few viable options for control. Many of our crops fall into the "minor crop" category, resulting in fewer pesticides labelled for use on them. This leaves Oregon farmers particularly vulnerable when an important product, like chlorpyrifos, is taken away.

HB 3058 impacts IPM strategies on the farm

Chlorpyrifos is one component of comprehensive IPM programs and helps to maximize yield and contribute to insect resistance management. It often is used in rotation with other products and not on a regular basis. Agriculture is dynamic. A farmer may not use a product much, or at all, for a year or two and then insect population pressures change, and the farmer must look to that product to save their crops. HB 3058 would eliminate a critical product in cases where few alternatives currently exist. In many instances those alternatives would be less effective and have greater impacts on non-target species (e.g. pollinators and beneficial insects). For crops with few alternatives, the economic impacts would be substantial.

Additionally, chlorpyrifos is used to manage pests on several crops that no other insecticides can control, including Christmas trees and clover grown for seed. Pests can have devastating effects on yield, and HB 3058 presents a serious concern for economic damage if the pest is left uncontrolled. While research is ongoing to understand pests and find other means of control, chlorpyrifos is still a much-needed tool in a small toolbox.

Chlorpyrifos is also a long-standing treatment for seeds and minor crops. As a seed treatment, it is used by seed producers and vegetable farmers and is necessary in situations where there is significant pest pressure. As no-till agriculture has become more prevalent, insect pressures have also increased. There are only a few products registered for use as seed treatment insecticides. Farmers base their seed treatment decisions on historical pest pressures as part of their IPM programs. Without chlorpyrifos, entire fields could be lost or resistance to other pesticides could develop. This would cause significant economic hardship for many Oregon farmers.

HB 3058 would impact international trade
A unilateral ban on the active ingredient chlorpyrifos would disrupt international trading and financially harm Oregon farmers. Approximately 80 percent of commodities grown in Oregon leave the state, and of those, half are exported to international markets. Other countries and states have strong phytosanitary requirements. Commodities that are exported to international markets can face rejection if an infestation of pests is found.

Additionally, if Oregon farmers lose the ability to use chlorpyrifos, they could be forced to turn to newer insecticides that may not be registered and do not have tolerances yet in a foreign market. Chlorpyrifos is currently registered in about 100 countries for use on more than 50 crops. Oregon producers may face trade restrictions in those markets if they lose access to the tool. HB 3058 would impact Oregon farmers' ability to produce and export agricultural commodities.

HB 3058 is not supported by science
The EPA evaluates and registers pesticides to ensure that they will not harm people, non-target species, or the environment. After years of testing and scientific studies, EPA determines if a pesticide can be sold and used. An across-the-board ban in Oregon is not supported by EPA's findings and would unnecessarily prohibit the use of critical tools for Oregon agriculture. Farmers have been using chlorpyrifos safely for over 40 years. A state-specific ban will let insects develop resistance to other chemicals more quickly and deprive farmers of a weapon in responding to new pest pressures. For some, there are no alternatives available.

In 2016 EPA's Science Advisory Panel rejected the agency's methodology in quantifying the risk posed by chlorpyrifos. And in 2017, the EPA declined to support a ban on the product, instead stating that it needed more time to come to a clearer scientific resolution on the matter. OFB urges the legislature to allow EPA, the agency responsible for the evaluation of chlorpyrifos, to continue its ongoing science-based and expert-led evaluation of the product, before taking unnecessary action that will impact Oregon’s agricultural industry.

Chlorpyrifos and neonicotinoids are important tools that are used as part of an IPM strategy to control pests and manage insect resistance. OFB respectfully asks the Committee to oppose HB 3058 and let the experts at EPA and ODA make determinations about the risks and benefits of individual pesticides used by Oregon farmers.

Thank you for the opportunity to provide testimony today. Please direct any questions to Jenny Dresler on behalf of the Oregon Farm Bureau (jenny@pacounsel.org).

OSU Oregon State University

North Willamette Research and Extension Center
Joe DeFrancesco, Assistant Professor – Senior Research
15210 NE Miley Road, Aurora, Oregon 97002-9543
Tel: 503-678-1264x145 / **Fax:** 503-678-5986
Email: defrancj@science.oregonstate.edu

March 22, 2019

Re: HB 3085, Ban on Chlorpyrifos

To Whom It May Concern,

As former Director of the IR-4 Field Research Center and Specialty Crops Research and Registration Program at Oregon State University, I do not support the ban on pesticide products containing the active ingredient chlorpyrifos, as its elimination from the marketplace would have serious negative impacts on the viability and profitability of many minor/specialty crops in Oregon. A ban would also eliminate an effective and essential tool used by many growers in their Integrated Pest Management (IPM) program.

Minor crops in Oregon generally have limited pesticide options for pest management. In many cases, chlorpyrifos fills a niche, providing low-risk, effective, critical uses for which there are no alternatives or where alternatives are less efficacious and more expensive. Chlorpyrifos also plays an important role as a rotation partner with other pesticides to reduce the likelihood of pesticide resistance.

For example, in strawberry production, chlorpyrifos is critical for control of garden symphylans when it is used pre-plant. There are currently no other alternatives for controlling this pest, which resides in the soil. Strawberry fruit yields would be diminished, and plant death can occur without effective management. Chlorpyrifos is also used post-harvest for control of the strawberry crown moth, which can also cause reduced yields and complete plant death if left uncontrolled. The economic impacts to the strawberry industry based on the loss of chlorpyrifos would be considerable.

In the brassica crops, such as broccoli and cabbage, chlorpyrifos is critical in controlling cabbage maggot. It is effective as a soil-active insecticide that prevents the entry of larvae into root tissue, where they are very difficult to manage once present. There is currently one other pesticide alternative that growers can use but it does not achieve the same level of control as does chlorpyrifos. Both products are needed for effective pest management and pesticide resistance. Cabbage maggot has the potential to cause complete crop loss if not effectively controlled.

Chlorpyrifos is used in many other vegetable crops. It is uniquely suited to prevent damage from seed maggots in snap beans grown in the Willamette Valley. Seed maggots feed on bean seeds as they begin to germinate and, thus, kill the seed. In snap beans, chlorpyrifos is used as a seed treatment prior to planting; stand loss can be as high as 75% if seed is not treated. In sweet corn production, chlorpyrifos is used at planting (in the seed furrow or banded over the row) to control seed corn maggot and other insects, such as cutworms, cucumber beetles, and

North Willamette Research and Extension Center
Joe DeFrancesco, Assistant Professor – Senior Research
15210 NE Miley Road, Aurora, Oregon 97002-9543
Tel: 503-678-1264x145 / **Fax:** 503-678-5986
Email: defrancj@science.oregonstate.edu

cabbage maggot. Pyrethroid and neonicotinoid products are alternatives to chlorpyrifos but neither are as effective, nor as broad spectrum, as chlorpyrifos.

In non-food crops, such as grass grown for seed and clover grown for seed, chlorpyrifos is an important and effective tool for control of a wide range of pests, including symphylans, billbugs, sod webworm, cutworms, aphids, and weevils, where alternatives are not as effective or has other issues, such as negative impacts on non-target organisms like pollinators and beneficial insects.

Chlorpyrifos is safe to humans, has little impact on water quality, and is highly efficacious. A "blanket ban" on all chlorpyrifos uses would eliminate many of the low-risk, unique uses described above. As such, I hope the Oregon legislature will reconsider the chlorpyrifos ban and consider the economic viability of the many minor crop industries that operate in Oregon. The diversity of crops grown in Oregon make our state a leader in agriculture production. Banning the sale and use of all products containing chlorpyrifos has the real potential of jeopardizing the viability of Oregon's many minor crop industries.

Thank you for the opportunity to comment.

Sincerely,

Joe DeFrancesco

OSU
Oregon State
UNIVERSITY

North Willamette Research and Extension Center
15210 NW Miley Road, Aurora, OR 97002

The Specialty Crops Research and Registration Program at NWREC IR-4 Field Research Center

Providing Oregon's Specialty Crop Growers with Safe and Effective Pest Control Options

What is SCRR?
The Specialty Crops Research and Registration program is conducted at OSU's North Willamette Research and Extension Center (NWREC), located in Aurora, OR, in collaboration with OSU researchers and extension personnel, growers, agrochemical representatives, crop consultants, and the Interregional Research Project No. 4 (IR-4). The SCRR program is part of a network of field research centers throughout the USA that cooperate with the national IR-4 program, conducting field research trials and laboratory analyses to determine safe levels of pesticides in agricultural crops. It is the only such center located in Oregon.

In any given year, the SCRR program conducts between 25 and 35 field residue trials in a wide variety of crops such as strawberries, blackberries, raspberries, blueberries, cranberries, grapes, apples, pears, cherries, plums, hazelnuts, grass seed, clover seed, hops, peas, beans, corn, broccoli, cabbage, cauliflower, Swiss chard, rhubarb, celery, spinach, lettuce, mustard greens, onions, radish, beets, carrots, potatoes, squash, chives, parsley, and cilantro.

The main goal of the SCRR program is to provide Oregon growers with the pest control options they need in order to effectively manage crop pests, ensure a stable and safe food supply, and maintain a healthy environment, while ensuring the success and profitability of Oregon farmers.

IR-What?
The IR-4 program is a unique partnership between the United States Department of Agriculture (USDA) and land grant universities, such as OSU. Data and information from the field trials and laboratory analyses that IR-4 coordinate are required by the United States Environmental Protection Agency (US-EPA) for the registration of safe and effective pest control products.

And More…
In addition to conducting field research for IR-4, the SCRR program at NWREC also hosts the State Liaison Representative to the National IR-4 program. In this capacity, SCRR personnel liaison with specialty crop growers in Oregon to:

- Identify pest problems and pest management needs.

- Evaluate alternative control measures.
- Develop pest management strategic plans and IPM guidelines.
- Assist agrochemical manufacturers and regulatory agencies in completing the registration process.

The SCRR program also coordinates and conducts field research trials to generate product efficacy and crop safety data.

Protecting Food and Environment: Testing the pesticide residue levels in our food provides assurance that:

- Pesticides used by farmers are registered by the US-EPA at safe application rates, which protects not only our food, but also our farmers and farm workers.
- Environmental health is protected by testing reduced-risk pesticides that have minimum impact on beneficial organisms and water resources.

About 80% of the field research in the SCRR program involves reduced-risk products, IPM-compatible alternatives, and biologically-based products.

Enhancing Oregon's Economy: The SCRR program provides considerable economic value to Oregon, where there are over 200 specialty crops (also known as "minor crops") with an annual farm-gate value of about $900 million, accounting for nearly 65% of Oregon's total agricultural commodity sales.

- The data and information generated in the SCRR program contributes to a potential economic loss avoidance of about $30 to $50 million per year for specialty food crops in Oregon.

Without Specialty Crops Research? Without some of these newly registered pest control products for specialty crop growers, yield and quality would be reduced, plant vigor would decline, or crops would be lost entirely.

The SCRR program at NWREC has helped Oregon's specialty crop growers obtain safe pesticide registrations over the years, enabling them to safely and effectively manage pests in their crops, increase yield, quality and crop vigor, and remain economically viable in the national and international marketplace, while protecting human health and reducing environmental impacts.

For more information:
Joe DeFrancesco
Director - SCRR/IR-4 Program
Oregon State University
Phone: 541-737-0718
Email: defrancj@science.oregonstate.edu

Funding for the Specialty Crops Research Program comes from a variety of sources, including USDA, OSU, Oregon Department of Agriculture/Minor Crops Advisory Committee, the agrochemical industry, and specialty crop commodity groups.

Support and Pass HB 3058

Dear Legislators,

I am a pediatrician who has been practicing in the Eugene Springfield area for the last forty years. I currently work for Peacehealth Medical Group.

I am writing you to support passage of HB 3058 which would ban the use of chlorpyrifos. Scientific consensus notes that these agents have been associated with developmental disabilities in children. These nerve agents have been shown to cause brain damage in the developing brains of babies and toddlers. Lower IQs, impaired working memory and delayed motor development are all likely consequences of intrauterine exposure or exposure more directly from pesticide drift or residue in food.

I am confronted every day I my professional life with ADHD and other behavioral problems leading to school failure. These agents have a direct link to contributing to these problems. Although we do have interventions which help children with these problems the reality is that schools are overwhelmed with the challenge and many children suffer from academic failure.

I am distressed that there are more restrictions on the use of dangerous pesticides use in the production of cannabis than in food production. Chlorpyrifos have no place in the growing of foods. These agents are systemic and therefore cannot be washed of fruits and vegetables. General consumers are unlikely to be prepared to understand how to use these agents properly.

We have a system in place to assure that medicines and vaccines are safe before they are released for use on our patients. It is with some degree of outrage to note there exists quite a different culture when it comes to use of chemicals in our environment.

In summary then I heartily support HB 3058. This represents a small step in the right direction to protect the people of Oregon and future generations of Oregonians.

Sincerely yours

John Dunphy MD

Pediatrician; Peacehealth Medical Group

Home address: 36041 highway 58; Pleasant Hill, Oregon, 97455

Mountain Rose Herbs is a mission -based company whose motto is people, plants, and planet before profit. Founded in 1987, we are a certified organic, retail purveyor of herbs and spices, loose-leaf teas, essential oils, body care products, culinary delights, and DIY supplies. Our catalog and website feature over 1500 organic products and we ship over 1000 packages daily direct to customers. In 2017, we operated in seven buildings with a total of 137,350 sq. ft. in Eugene, Oregon. We are committed to sustainable business practices, organic agriculture, and equality.

Our success depends on our ability to attract and retain a high quality workforce

Mountain Rose Herbs employs over 200 people. We offer highly competitive wages, an excellent benefit and retirement package, personal finance and herbal education opportunities, supplemental insurance, an alternative commuting program, and 24 hours of annual paid time for community involvement. Employee led service programs such as the Mountain Rose River Project allow for personal interaction with ownership while working together to enhance our community. In 2017, Mountain Rose Herbs employees volunteered 815 hours, donated 668 pounds of canned food and spices to Food for Lane County and gave 514 pounds of clothing to Occupy Medical and St. Vincent de Paul.

Our values of prioritizing people, plants and planet lie at the core of every business decision we make

From product quality and sustainable packaging to fair trade and watershed conservation, we promise our customers that we will do business right. Our business model is reliant upon the success of sustainable agricultural practices and organic farming. Our entire line of plant-based products is certified organic whenever possible or wildharvested in landscapes free from synthetic fertilizers and pesticides. At our in-house Quality Control Laboratory, we rigorously test products to ensure their safety and authenticity for our customers.

Tours of our facilities are available to community and business leaders who are interested in learning more about our environmental programs and sustainable business action plans. We are proud to have converted to 100% renewable energy by investing in solar power and offsetting our remaining electrical usage through development projects with NativeEnergy and our local utility's Greenpower Program. In 2017, our in-house solar array generated 34 MWh of power for our facility, and we offset 876 metric tons of carbon emissions. The same year, our overall electrical use decreased by 15,023 kWh even though we added two buildings.

Our campus includes a biolswale, rain garden, native landscaping, and a 'Rewilding Project' that earned Salmon-Safe certification in 2013. After our water consumption increased in 2015, we instituted water conservation practices resulting in the conservation of over 150,000 gallons of water in 2016 and 37,500 gallons in 2017.

Mountain Rose Herbs became the first company in Oregon to receive TRUE Zero Waste Facility Certification from GBCI and we qualified at the highest level—Platinum. Extensive waste and recycling efforts have us on track to do even better in 2018, with internal audits revealing more than 97% of our waste is being diverted from the landfill.

Thank you for your interest and we hope you will visit www.mountainroseherbs.com or see the annual Mountain Rose Herbs Sustainability Report for additional information.

Support SB 853, HB 3058

A growing body of scientific study shows threats from several commonly used pesticides to human health, water quality, aquatic species, pollinators, and the biodiversity upon which we all depend.[i] While ensuring state agencies are upholding their responsibility to protect the public, we must pursue common sense solutions that also protect responsible businesses, farmers, schools, and workers.

Neonicotinoids

Neonicotinoids ("neonics") are a class of synthetically created neurotoxic pesticides widely used for domestic pest control and on a broad range of food, energy, and ornamental crops. They are highly toxic to insects, pollinators, and freshwater invertebrates, posing threats to water quality, fish, and birds. Neonics are highly persistent in soils, wildflowers, streams and lakes.[ii] After 242 scientists from around the world cited an "immediate need for national and international agreements to greatly restrict their use", the European Union recently banned the outdoor use of three neonics.[iii] Oregon currently requires certification and training in order to buy, sell, or disseminate over 500 restricted use pesticides, yet none of the neonics are included on the list. SB 853/HB 3058 would add neonics to the list of restricted use pesticides, and HB 2619 would ban them in Oregon.

Chlorpyrifos

Chlorpyrifos is a widely used organophosphate insecticide tied to development disorders in children that is harmful for humans to touch, inhale or eat.[iv] It acts as a nerve agent, attacking chemical pathways in the body creating a breakdown in the ability of nerves to communicate and function.[v] The United States Environmental Protection Agency under Scott Pruitt recently refused to finalize a court ordered national ban on Chlorpyrifos, necessitating action at the state level.[vi] To protect the health of farmworkers, to safeguard our food supply, and to protect our environment, we urge Oregon to join Hawaii in passing the statewide ban on Chlorpyrifos found in SB 853/HB 3058.

---

[i] The Xerces Society. "Scientists Urge Action to Protect Waters from Neonicotinoid Insecticides". 3/13/18.
Lipton, Eric. *New York Times*. "Court Orders E.P.A. to Ban Chlorpyrifos, Pesticide Tied to Children's Health Problems". 8/9/18.
[ii] Goulson, Dave and 232 Signatories. *Science Magazine*. "Neonicotinoids: An open letter to policy makers and regulators". 6/1/18
[iii] Butler, Declan. *Nature*. "Scientists hail European ban on bee-harming pesticides". 4/27/18.
[iv] National Pesticide Information Center. Chlorpyrifos General Fact Sheet. 4/10.
[v] Cuthbert, Lori. *National Geographic*. "EPA Must Ban Dangerous Insecticide". 8/10/2018
[vi] National Resources Defense Council. "Hawaii Bans Use of Toxic Pesticide Chlorpyrifos" 6/13/18.

From:	Jonathan Spero
To:	Exhibits HAGLU
Subject:	SB 853, HB 3058
Date:	Monday, March 25, 2019 10:04:01 AM

I write this in support of bot SB 853 and HB 3058. Both neonic's and chlorpyrfos cause harm beyond their benefit. Markets for all Oregon Ag products are enhanced when buyers see Oregon as a producer of clean products. Please pass both of these bills
Jonathan Spero, Lupine Knoll Farm
--
Jonathan Spero
Lupine Knoll Farm
1225 Messinger Rd.
Grants Pass OR 97527
541-846-6845
new and heirloom vegetable seeds
Oregon Tilth Certified Organic

From:	Joni Zimmerman
To:	Exhibits HAGLU
Subject:	Support HB 3058
Date:	Sunday, March 24, 2019 10:19:13 AM

Dear Committee Members:
I am writing in support of House Bill 3058. I am so glad to see this bill before the Oregon Legislature. I am very concerned and worried about the decline of pollinators, and the overwhelming evidence that pesticide are poisoning us.

Chlorpyrifos is a neurotoxic pesticide that is very harmful to children, pregnant women, farmworkers, wildlife and beneficial insects. The EPA was ordered by federal courts to ban this dangerous pesticide from use on food crops. Oregon should take the strongest possible action to protect farm workers, children, the safety of our food and the environment with a statewide ban on chlorpyrifos. We can no longer wait for a dysfunctional EPA to take action. Hawaii has already banned chlorpyrifos and other states are taking action as well.

Chlorpyrifos is very harmful to farmworkers and are linked to developmental disabilities in children. These are highly toxic nerve agent pesticides that can damage the developing brains of babies and children, leading to lower birth weight, reduced IQ, loss of memory, and delayed motor development.

Neonicotinoids can persist in the environment many years after their application and are highly toxic to bees, beneficial insects, fish and birds. We urge the Oregon Legislative Assembly to add these bee-killing pesticides to Oregon's list of Restricted Use Pesticides. This step would remove neonic containing products from consumer store shelves, require training and a license to apply them and reduce their impact in urban areas.

There is mounting evidence* that neonicotinoids may be associated with congenital heart defects, neural tube defects, and autism spectrum disorder as well as being capable of disrupting normal hormone function in humans.

Neonics impact our ability to grow healthy and culturally appropriate food produced through ecological and sustainable ways, and our right to define our own food and agriculture systems.

Neonicotinoids indiscriminately kill all insects and aquatic invertebrates, a.k.a., beneficial insects that support ecosystems.

I strongly believe that no one has the right to poison our collective environment, the environment that we share with myriads of other creatures, to further their own economic interests. For too long we have allowed the few to profit at the expense of the many and at the expense of the health of our ecosystem and the very existence of life on this planet. With this bill, you have the opportunity to take a small step towards righting a decades long wrong and preserving life on earth for a few more years.

Thank you for your support of this bill!

Joni Zimmerman
Newberg, Oregon

From:	Joyce McPartland
To:	Exhibits HAGLU
Subject:	House Bill 3058 and Senate Bill 853
Date:	Tuesday, March 26, 2019 6:38:55 AM

Please pass both of these extremely important bills for pesticide reform legislation.

House Bill 3058 and Senate Bill 853 would ban the use of chlorpyrifos, a toxic nerve agent pesticide proven to cause brain damage in children, contaminate waterways and harm wildlife. These bills would also restrict the use of bee-killing neonicotinoids to licensed professionals only, thus removing them from store shelves.

Thank you,
Joyce McPartland

From: Julia Barbee
To: Exhibits HAGLU
Subject: 3058
Date: Tuesday, March 26, 2019 11:05:30 AM

Please enact house bill 3058 to prohibit toxic chemicals killing our pollinators! My children deserve a brighter future than this.

www.juliabarbee.com

To whom it may concern,
I support House Bill 3058 and its ban on chlorpyrifos and restrictions on neonicotinoid insecticides. Oregon DEQ water quality data repeatedly show chlorpyrifos and neonicotinoid insecticides in rivers and streams throughout Oregon. Chlorpyrifos was detected in 6 of 11 Pesticide Stewardship Partnership (PSP) Program watersheds from 2012 - 17, and chlorpyrifos was named a ‘pesticide of concern’ for detections in 2015-17 (Oregon Water Quality Pesticide Management Team, 2018, PSP Program 2015-2017 Biennial Report https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.oregon.gov/ODA/shared/Documents/Publications/PesticidesPARC/PSPBienniumReport2017.pdf&ved=2ahUKEwjVIp2hxqDhAhXRrZ4KHdcZDDoQFjABegQIBBAB&usg=AOvVaw31sBLpGUaUVTdU7Eb6XAK1)

The current uses of these insecticides are not preventing contamination in the environment. HB 3058 will protect the environment by further restricting uses of these chemicals.

Thank you for your consideration,
Julia Crown
Resident
Portland, OR

NWJP NORTHWEST WORKERS' JUSTICE PROJECT

812 SW Washington, Ste. 225, Portland, OR 97205 | 503-525-8454 | www.nwjp.org

Testimony before the House Committee on Agriculture and Land Use
March 26, 2019
HB 3058

We submit this testimony on behalf of our members and clients. The undersigned are a group of diverse organizations that focus on workers' rights.

Pesticide exposure causes farmworkers to suffer more chemical-related injuries and illnesses than any other workforce nationwide. Occupational exposure to pesticides poisons as many as 20,000 farmworkers every year, according to estimates by the EPA. The true numbers are likely much higher.

Farmworkers are exposed to pesticides in a variety of ways. Workers who perform hand labor tasks in treated areas risk exposure from direct spray, aerial drift, or contact with pesticide residues on the crop or soil. Workers who mix, load, or apply pesticides can be exposed to pesticides due to spills, splashes, and defective, missing or inadequate protective equipment.

Even when not working in the fields, farmworker families, especially children, are also at risk of elevated pesticide exposure. Workers bring pesticides into their homes in the form of residues on their tools, clothes, shoes, and skin. They inadvertently expose their children through a hug if they cannot shower after work. The close proximity of agricultural fields to residential areas results in aerial drift of pesticides into farmworkers' homes, schools, and playgrounds. Some schoolyards are directly adjacent to fields of crops that are sprayed with pesticides.

Chlorpyrifos is a neurotoxic pesticide known for its damaging effects on the human nervous system. Short-term symptoms of low-dose exposure may include headaches, agitation, inability to concentrate, weakness, tiredness, nausea, diarrhea and blurred vision. Higher doses can lead to respiratory paralysis, endocrine disruption, lung and prostate cancer, and death. Pregnant women and the developing fetus are more sensitive to chlorpyrifos toxicity. Studies have shown that exposures to even very low doses of chlorpyrifos during the nine months of pregnancy are associated with lower birth weight and adverse neurodevelopmental effects to children, including diminished cognitive ability (loss of IQ points), poorer working memory, and delays in motor development.

Additionally, neonicotinoids are currently the most widely used pesticides in the world and a recent study shows that they have an impact on human health as well. The study, published by Environmental Health Perspectives, shows a link between neonicotinoid exposure and the development of cancer cells.

HB 3058 will greatly strengthen worker protections around pesticides. We urge you to support this bill that will protect farmworkers and their families.

Thank you,

Association of Western Pulp and Paper Workers

Communication Workers of America, Local 7901

Portland Jobs with Justice

Northwest Forest Worker Center

Northwest Workers' Justice Project

> From: kate taormina <katetaormina@hotmail.com>
> Sent: Tuesday, March 26, 2019 10:47 AM
> To: SENR Exhibits <SENR.Exhibits@oregonlegislature.gov>
> Subject: Public Comment on HB 3058
>
>
> Dear Chair Clem and Members of the House Agricultural and Land Use,
>
> I am submitting this Public Testimony in support HB 3058 which will ban the purchase, sale and use of Chlorpyrifos. This bill also lists Neonicotinoids as Restricted Use Pesticides.
> As an alumni of OSU who has studied Entomology, Horticulture and holds a B.S in Soil Science, I urge you to consider this very important Bill. My work is as a landscape gardener in Southern Oregon. With this work comes the important task of not only protecting the land I work on, but also the humans, animals and who live upon the land. With my years of studying science I have chosen to work directly with plants, soils and insects, birds and water. I have also chosen to do this work, successfully, without the use of toxic chemicals. The work other scientists have chosen to do in laboratories is very important; the studies being carried out on the harmful effects of the pesticide Chlorpyrifos and Neonicotiniods should be taken seriously by all. It is time to consider the true costs of applying poisons into the environment. Countless times I have observed people in garden stores who are in the pesticide aisle trying to decide what to buy. I am not certain what prompts them to choose one product over another, but it is similar to observing someone shopping for a product they know nothing about, but might just be guided by packaging. The problem here is this: these products are POISONS. They have consequences far reaching that affect the health and well being of all life. These products can, will, and HAVE polluted waterways, human bodies, insects, and soil. I have studied pesticide warning labels so I know what those warnings mean. I do not think most of the general public buying products which contain Chlorpyrifos or Neonicotinoids have a clue what they are purchasing. Even if a purchaser could read the fine print, I strongly believe they are not aware that the product they hold in their hand can and will reach far and wide away from their target pest. This is not the fault of the consumer. The general public has the faith in their Government to PROTECT them from toxic chemicals. REGULATION is key. There is NO QUESTION about this; we should not be leaving such important decisions up to homeowners to make.
>
> Beyond the the common use of Chlorpyrifos and Neonicotinoids by the general public, the use of these chemicals by trained professionals on school grounds and in children's parks is not only irresponsible but dangerous. Here we have people who are trained to know how to read and understand the warning labels on pesticide containers, AND who will willingly apply these chemicals where people, children, play!
>
> These chemicals are found in residual amounts on fruits and vegetables as a result of being used on crops by farmers. Farm workers who work in the fields are exposed to these toxic poisons.
>
> Entomology labs doing studies on different families of insects have determined that these chemicals are having an alarming effect on insect populations. Insects we rely on for pollination and as well as other integral benefits in agriculture.
>
> I urge you to let common sense as well as the scientific studies guide you in making responsible decisions about how Oregon moves forward with pesticide reform.
>
> Sincerley,
> Kate Taormina
> Takilma, Oregon

Clatsop County
Board of Commissioners

800 Exchange St., Suite 410
Astoria, OR 97103
(503) 325-1000 phone / (503) 325-8325 fax
www.co.clatsop.or.us

March 19, 2019

House Committee on Agriculture and Land Use
900 Court St. NE
Room 347
Salem, Oregon 97301

Re: Support for Oregon SB 853 and HB 3058- Ban on Chlorpyrifos and Restrictions for Neonicotinoids

Dear Chairs Clem and Dembrow, and Members of the Senate Committee on Environment and Natural Resources, and House Committee on Agriculture and Land Use:

On March 13, 2019, the Clatsop County Board of Commissioners voted to support SB 853 and HB 3058. These two bills, if passed, ban the use of chlorpyrifos, as well as classify neonicotinoid pesticides as "restricted use" in Oregon allowing only those trained to be able to use them. In addition, SB 853 supports Oregonians who use pesticides in their business or profession to receive training and licensing from the Oregon Department of Agriculture by reducing the licensing fee.

Clatsop County, a coastal and river community, cares about safe water for all residents, visitors, businesses and wildlife. The Board of Commissioners chose to support these bills as an action to protect pollinators, wildlife and children. Clatsop County wants to protect public health and expects our government to do all that it can to keep Oregon's food systems viable and our drinking water safe. It is necessary to end the sales and uses of chlorpyrifos in Oregon to protect the safety of drinking water and our food system. According to the US EPA, there is no safe level of exposure to this potent neurotoxin. In fact, after many years of research, chlorpyifos were banned for use in residential settings in 2001. Exposure during pregnancy may harm the development of children and could cause children to have adverse health outcomes from the exposure of chlorpyrifos. In 2016, the Environmental Protection Agency (EPA) released a human health assessment that proposed to revoke all tolerances for chlorpyrifos, which included consumption exposure through residues on food and contaminated water. Food testing has shown that chlorpyrifos is detectable at unsafe levels for children. Due to changes on the national level between 2016 and today, it is now up to the state of Oregon to put protections in place for its citizens.

Clatsop County also supports classifying neonicotinoids as a restricted use pesticide. Oregon already lists hundreds of pesticides as restricted use products due to their toxicity to the environment or to humans. Adding neonicotinoids to the list of restricted pesticides does not take these tools out of the toolbox; they can still be purchased and used by trained and licensed pesticide applicators. It makes sense to ensure that applicators are licensed because neonicotinoids are a class of synthetic, neurotoxic pesticides that persist in the environment and are highly toxic to bees, beneficial insects, fish and birds. Even years after an application, neonicotinoids can kill bees or damage their ability to forage for food or find their way back to the hive.

Oregon needs to do all it can to protect bees. Bees support Oregon agriculture and are responsible for one in every three bites of food we eat. We must be concerned that these beneficial insects are declining at unsustainable rates.[1] In 2014, a comprehensive review of more than 1,121 peer-reviewed studies released by the Task Force on Systemic Pesticides- a group of global, independent scientists- confirmed neonics are a key factor in bee declines and are harming beneficial organisms essential to functional ecosystems and food production, including soil microbes, butterflies, earthworms, reptiles, and birds. The Task Force called for immediate regulatory action to restrict neonicotinoids.[2] Scientists recognize that neonicotinoids represent a major worldwide threat to biodiversity and ecosystems.[3]

Clatsop County Commissioners are endorsing HB3058 and SB 853, which would ban chlorpyrifos and make neonicotinoids only available to those trained and licensed to use them. These bills would help protect the food system, the agricultural economy and Oregon's environment. Passing these bills is the right thing to do and now is the right time.

Sincerely,

Kathleen Sullivan
Clatsop County Board of Commissioners

---

[1] Pollinator Partnership. (2019). About Pollinators. Pollinator Partnership. Retrieved from https://pollinator.org/pollinators#fn

[2] Van de Sluijs, J.P. et al. Conclusions of the Worldwide Integrated Assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning. Environ.Sci.Pollut.Res. (2014).doi:10.1007/s11356-014-32295

[3] International Unioned for Conservation of Nature. (2017, September 20). Severe threats to biodiversity from neonicotinoid pesticides revealed in latest scientific review.ICUN. Retrieved from https://www.iucn.org/news/secretariat/201709/severe-threats-biodiversity-neonicotinoid-pesticides-revealed-latest-scientific-review

OFS
Oregonians for Food & Shelter

RENEW OREGON'S PESTICIDE USE REPORTING SYSTEM (PURS)

We urge legislators to look closely at the benefits of reinstating and funding Oregon's Pesticide Use Reporting System ("PURS"). PURS allows Oregon Department of Agriculture to collect specific data on businesses' and government entities' use of pesticides, including private land, government land, and areas where the public has access. The PURS program is the result of significant legislative consensus 20 years ago, protects confidential data and provides the state with data to understand how registered pesticides are used throughout Oregon. Unfortunately, the program only collected data for a brief period in the late 2000s.

Without reinstating the PURS program, legislative decisions regarding pesticide restrictions are premature. We encourage the legislature to prioritize the PURS system and avoid difficult technical or policy decisions on pesticides without leveraging our existing infrastructure for monitoring and analyzing pesticide use throughout the state.

HISTORY

The 1999 Oregon Legislature passed legislation to require all pesticide users to report their pesticide use to the Oregon Department of Agriculture. Both agricultural and environmental groups supported this legislation. The program was funded by a 50/50 split between pesticide product registration fee increase of $40 per product per year and the general fund.
2008 was the first full year of reporting. In 2009, the Legislature defunded the PURS program and shifted the funding to the Pesticide Stewardship Program. The statutory framework for PURS is set to sunset in 2019.

ELEMENTS OF PURS

- **Who Reports:** any person who uses or applies a pesticide in the course of business or any other for-profit enterprise, or for a government entity, or in a location intended for public use or access.
- **What's Reported:** Product and EPA registration number, amount, and application location. All individual information is kept confidential, but data can be aggregated and shared for qualified research purposes.
- **Reporting Frequency:** At least once per year, due January 31 for the prior year.
- **Exemptions:** Only antimicrobial pesticide applications and applications by households are exempt from reporting.

HB 2980

HB 2980 proposes a ten-year extension of PURS, as long as the reporting elements and 50/50 split of funding remains the same. Additional conversations regarding funding, both from registration fees and the general fund can lead to Oregon having a renewed understanding of pesticide use.

Without PURS, the legislature is not equipped or informed to make technical decisions about individual applications. Extending and funding PURS is the logical first step before any renewed legislative efforts to regulate pesticides.

For questions or additional information, contact:
Rocky Dallum at rocky.dallum@tonkon.com or 503-830-5098
Katie Fast at katie@ofsonline.org or 503-510-5293

TESTIMONY

March 26, 2019

House Committee on Agriculture & Land Use
Chair Brian Clem

RE: Opposition of HB 3058 -- *Relating to pesticides. Prohibiting sale, purchase or use of chlorpyrifos and making neonicotinoid pesticides Restricted Use Pesticides*

Submitted by: Katie Fast, Executive Director

Oregonians for Food & Shelter (OFS) is a grassroots coalition of farmers, foresters, and other technology users focused on natural resource issues involving pesticides, fertilizer, and biotechnology. We are writing you today in opposition to House Bill 3058 which would ban chlorpyrifos insecticide and list neonicotinoid insecticides as Restricted Use Pesticides (RUP) with the Oregon Department of Agriculture (ODA). We thank you for the opportunity to submit comments on this important issue.

Chlorpyrifos is a critical tool for growers of more than 50 different crops in nearly 100 countries. Oregon farmers rely on chlorpyrifos because of its efficacy, low cost, and compatibility into Integrated Pest Management and resistance management programs. For many pests that can cause serious economic impact, farmers face limited alternatives especially here in Oregon.

Due to our diversity of over 200 crops, many Oregon farmers face additional challenges in managing pest problems. Many of Oregon crops are grown on small acreage and considered minor specialty crops. Most of these specialty crops do not have many pesticides labeled for their use. Many times, chlorpyrifos is the only product available to address certain pests.

To address some of these issues, the Environmental Protection Agency (EPA) allows the states to use Special Local Need (SNL) registration authority for specialty crops that may not otherwise have products available to control crop pests. Three specific criteria which need to be met before a SLN request will be considered in Oregon are:

1. There is no pesticide product registered by the EPA for such use.
2. There is no EPA- registered product which, under the conditions of use within the State, would be as safe and/or as efficacious for such use within the terms and conditions of EPA registration.
3. An appropriate EPA- registered pesticide product is not available.

In Oregon, Christmas trees and many crops grown for seed such as clover, carrots, radish, daikon, table beets, sugar beets, swiss chard and perennial grass seed rely on SLN registrations of chlorpyrifos to control insects.

Chlorpyrifos exhibits moderate mammalian toxicity and is not carcinogenic, a selective reproductive or developmental toxicant, or an endocrine disruptor. Chlorpyrifos is biodegradable and has only short-to-moderate persistence in most environmental settings.

The widespread international registration approvals for chlorpyrifos and the establishment of more than fifty international residue limits by the Codex Alimentarius Commission for chlorpyrifos residues on food crop commodities have facilitated global free trade of treated crops. This is especially important for Oregon's many crops that rely on export markets.

In March 2017, EPA denied a petition filed by the Pesticide Action Network North America (PANNA) and the Natural Resources Defense Council (NRDC) asking to revoke all pesticide tolerances (maximum residue levels in food) for chlorpyrifos and cancel all chlorpyrifos registrations. Currently there is an ongoing judicial review by the full U.S. Ninth Circuit Court to determine the action EPA must take regarding chlorpyrifos use and the revocation of all chlorpyrifos tolerances. The resulting regulatory measures from this pending court decision will determine the outcome of chlorpyrifos. The supporting science of chlorpyrifos covers over 45 years of research and EPA has produced a vast collection of science-related documents to support pesticide registration decisions. EPA reviews data and current research on each pesticide at least every 15 years to determine if it still meets registration standards and address any changes that may be relevant to the use of chlorpyrifos. EPA is conducting this ongoing registration review and will complete their assessment by the statutory deadline of October 1, 2022

OFS respectfully requests that you allow the federal court and EPA determine the future of chlorpyrifos and not make an uninformed decision at the state level to ban this much needed pesticide. Whatever actions are taken federally would apply to all crops and all states. ***OFS asks that you oppose this bill as it will single out Oregon growers and put them at a significant disadvantage in a competitive and national market*.**

Neonicotinoids as Restricted Use Pesticides

Neonicotinoids are an entire CLASS of insecticides including seven different active ingredients and over 625 products registered in Oregon. Farmers *and* homeowners use neonicotinoids to safely protect a wide variety of crops, crop seed prior to planting, ornamental flowers, trees and shrubs, and even outdoor school areas and dog and cat flea collars.

"Neonic" products have replaced older, more toxic insecticides because of their effectiveness and they are less toxic to birds and mammals. Neonicotinoid products are classified as 'general use' by the U.S. Environmental Protection Agency (EPA) and have been registered under EPA's Conventional Reduced Risk Program due to their favorable mammalian safety and environmental profile.

Changing neonicotinoid pesticides to Restricted Use Pesticides (RUP) in Oregon will remove these tools from homeowners and growers without scientific justification. There has been much discussion over the last few years around neonicotinoids and pollinators. It must be highlighted that the concerns around pesticide use and potential effects on bees are very important, but especially important to those involved in agriculture. Oregon farmers depend on bees to pollinate many of their crops, but also depend on pesticide tools to control destructive pests. Similarly, commercial beekeepers rely on healthy crops to optimize their pollination services. This means that Oregon growers and beekeepers have a lot at stake in this conversation and each share a vested interest in ensuring that protecting bee health, and the use of pesticides, are not mutually exclusive. Bee health is important to all of us and nobody wants to see adverse incidents that add to bee population declines. That being said, it is easy to let emotion drive the conversation around these issues, when we should instead let science be our guide.

The science-based labels on pesticide products are the law and we regularly remind our members of the importance of reading and following them. Incidents of illegal applications should be addressed on a case by case basis but should not be used as a reason to add more restrictions on legal use.

Any person who uses a RUP is required to be certified (by taking and passing one or more pesticide examinations) and then licensed by the Oregon Department of Agriculture (ODA) as a pesticide applicator. Many growers only use general use pesticides and would now be required to get a license. ***The pesticide licensing process is not designed for homeowners and ODA does not have a process available for licensing homeowners as pesticide applicators.***

Since neonics are classified as general use by the EPA making them a RUP in Oregon would **require changing the registration, distribution and use of over 625 products**. This would be costly, confusing and would create immediate violations as distribution of these products (currently as General Use Pesticides) are available in many pet stores, garden centers, big box stores, local farm stores and agricultural pesticide dealers.

When considering regulations surrounding pesticides it is always important to look at what regulations are already in place. All pesticides used in Oregon must go through the EPA and ODA registration processes. At the federal level this happens under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Initial and ongoing re-registration is subject to a substantial review process and registered products must meet the high standard of having "no unreasonable adverse effect on health or the environment." This means that the pesticides of concern in these cases have had extensive human health and environmental safety testing including:

- Honeybee acute contact toxicity (all outdoor use products)
- Honey bee toxicity of residues on foliage (if high acute toxicity and exposure likely)
- Field testing for pollinators (specific conditions)

The issue of declining bee populations unfortunately has no simple answer. In fact, research on Colony Collapse Disorder (CCD) has highlighted a complex interaction of numerous factors that play a role in bee health and found no singular cause of the problem. While pesticides are often noted as one factor, they are not considered the primary one.

While the current research is not showing neonicotinoids as a primary factor in bee health decline, we know that it may be tempting to place restrictions on their use for precautionary reasons. Unfortunately, this approach ignores the important role these products play in managing pests that can have devastating effects on the environment. Neonicotinoids provide unique environmental, economic and public health benefits, such as:

- Effective protection against invasive species which can harm important urban landscapes. (i.e. control of the Emerald Ash Borer which can devastate urban forests).
- Systemic insect control not provided by other chemical classes.

- Lower impact on many non-target organisms than the older products they replaced, protecting natural enemies which allows for greater use of Integrated Pest Management (IPM) strategies.
- Effective control of disease carrying vectors. Neonics are some of the most effective tools for the control of bedbugs.
- Extended control which limits the needed number of applications, and therefore limits applicator risk of exposure.
- Control of pests which are resistant to other chemical classes.

We believe that a thorough review of the data shows that neonicotinoids are a safe, effective tool for protecting human health and property. Making these important products Restricted Use in Oregon will result in less options to contain destructive pests with little, if any, benefit to bee populations. Further, an overly broad response to pollinator concerns, such as HB 3058, may result in additional harms and risk. Neonicotinoids are a safe and effective tool for managing unwanted pests. In light of the current science and collaborative efforts to protect pollinators, we ask you to **vote NO on HB 3058.**

Thank you for your consideration, and please contact us if you have any questions.

From: Kent Burkholder
To: Exhibits HAGLU
Subject: HB 3058
Date: Monday, March 25, 2019 8:26:39 PM

Dear Chairman Clem and committee:

I am a fifth generation grass seed farmer from Albany. I am urging you to NOT support house bill 3058. I have some major concerns, especially with the proposed ban on chlorpyrifos.

We currently use chlorpyrifos rather sparingly but we do use some each year. When we can use something else, usually something that is more pest specific, that is usually what we do. There are some pests that just don't respond very well or have gained resistance to some of the more pest specific insecticides. In a lot of cases chlorpyrifos will be able to take care of them. Another instance is that some pests spend very little time above ground and when they are above ground there is only a very small percentage of them that are above ground at the same time. It is very important that we have something like chlorpyrifos that we can spray in the rain and have it rained in to the soil to help control those pests. A lot of the more pest specific insecticides are contact only.

Another issue we have Oregon agriculture is that we have a lot of diversity in our cropping systems. On our farm we currently have 7 different types of crops. There are somewhere around 220 different commodities raised in Oregon and almost all of them are considered minor. What that means for us is that chemical companies do not spend much money developing chemicals for crops that we raise. Most of what we have to use is something that was developed for some other major crop i.e. corn and soybeans. If we lose chlorpyrifos it is unlikely that anyone will develop something specific for us to step in its place. We will, guaranteed, be forced to apply more product and apply those products more frequently to try and control pests that chlorpyrifos currently controls for us. In short, that will cost us, as farmers, more money. It will also increase the potential for impact to the public as well as result in more chemicals being sprayed more often, not because we want to but because we have to. Trust me, I really don't enjoy spraying but it is something we must do sometimes in order to raise the best crop we can. The inputs are all the same in raising our crops and if we can't control what is eating up the crop, so to speak, it sometimes is the difference of finishing the year with a profit or a loss.

I believe it is important to use science in determining how we regulate pesticides. Chlorpyrifos is safe when used according to the label, it has endured countless research and trials to determine if it is safe to use. If there was any question of its safety when it was researched and the trials it was in there would have never been a label issued in the first place. ODA has the tools, training and expertise to determine if the chemical was used irresponsibly or off the label. It can also test if there was any illegal drift from the application. If it determines there was something done illegally or off label it can and does enforce and fine the violators.

Thank you for the opportunity to submit testimony.

And again I ask that you NOT support this bill. Feel free to contact me if you have any questions or want clarification on anything ag, I will help you if I can.

Sincerely, Kent Burkholder
kntbrkhldr@yahoo.com
541-974-0187
5046 Grand Prairie Rd, Albany 97322

Raszka Shelley

From: Exhibits HAGLU
To: Kevin Osborne
Subject: RE: HB 3058

SHELLEY RASZKA | Executive Support Specialist | Senior Committee Assistant
Legislative Policy and Research Office

Oregon State Capitol
900 Court St NE Rm. 347
Salem, OR 97301
503-986-1502

House Agriculture & Land Use

House Natural Resources

Note: Please use discretion with your personal information in written testimony (i.e., do not add personal information you do not want the public to see). All meeting materials, including your name and any personal information contained in the submitted documents, are posted to the Oregon Legislative Information System (OLIS) and are accessible to all major search engines, including Google, Bing, and Yahoo.

From: Kevin Osborne <kosborne@alliedseed.com>
Sent: Thursday, March 21, 2019 2:08 PM
To: Exhibits HAGLU <HAGLU.Exhibits@oregonlegislature.gov>
Subject: HB 3058

To Whom It May Concern,

I am emailing today in opposition of SB 853. I am a resident of Ontario, OR and the Production Manager for Allied Seed LLC which is an Idaho based company but we also operate a warehouse in Albany, OR and contract nearly 12,000 acres of seed production throughout the Williamette Valley, Union County, Baker County, and Malheur County. These seed crops include but are not limited to, perennial ryegrass, annual ryegrass, tall fescue, clovers, radish, mustard, alfalfa, and orchard grass.

We stand heavily in opposition of the complete ban on Chloropyrifos as this chemical is one of the few chemicals that provide us with a tool to control insect pressure in our seed crops. We deal with several species of insects that include thrips, lygus, weevil, maggot, aphid, among many other insects. These insects, if left unchecked, have been known to devastate seed crops to the point that the crop is deemed a failure which is both costly to our growers as well as to the seed dealers contracting these crops. Chloropyrifos is a broad spectrum insecticide that has a proven record of working well on these insects and provides a cost effective tool to our growers to ensure that we are able to have successful seed crops. Aside from the direct harm to crops that a ban on Chloropyrifos would put on Oregon growers it would also put Oregon growers at a marketing disadvantage to other states and countries that will continue allowing the use of the chemical. Without a proven chemical such as Chloropyrifos, Oregon growers will be forced to look for alternatives that may be more costly or will have to apply more chemical because the alternatives are not as effective as Chloropyrifos which will put more strain on the environment and will cost growers more in application costs. Since these growers compete in marketing with those states and countries that will continue to have proven, cost effective chemicals they will be able to market at lower prices and continue to maintain margins that Oregon growers will not be able to collect.

Regarding requiring that neonicitinoids be listed as a restricted use chemical, requiring an applicators license, we consider this a moot point as to our knowledge all of the neonicitinoids that our growers are using are already labeled as restricted use. Also the majority of our growers, if not all, already carry licenses to use restricted use chemicals. This bill seems to be merely a redundancy to the system that is already in place by our federal government.

For these reasons I ask that you vote down this proposed legislation.

Thank You,

Kevin V. Osborne
Production Coordinator
Allied Seed LLC
9311 Hwy 45
Nampa, ID 83686
kosborne@alliedseed.com
www.alliedseed.com
Office 208.466.6700
Cell 208.960.4771
Fax 208.466.9074

March 25, 2019

House Committee on Agriculture and Land Use
Oregon State Legislature
900 Court Street, NE
Salem, Oregon 97301

RE: HR 3058, Relating to pesticides

Dear Honorable Members of the Committee on Agriculture and Land Use,

On behalf of Pesticide Action Network (PAN) North America and our 2,880 members in Oregon, I am writing to urge your support for HR3058, which would prohibit the sale, purchase or use the toxic pesticide chlorpyrifos and list neonicotinoid pesticides as restricted use. This bill is a necessary step to protect public health, the environment and the food system in Oregon.

PAN is a national public interest group dedicated to promoting healthy and sustainable agriculture that is not reliant on hazardous pesticides. We are part of a global network that was established in 1982.

Chlorpyrifos is an organophosphate pesticide which was banned from residential use 18 years ago to protect children's developing nervous systems — yet agricultural uses were allowed to continue. The health harms of chlorpyrifos are very significant and the legislature must act expeditiously to protect the people of Oregon, especially children, from continued harm caused by chlorpyrifos exposure. Substantial research has shown that:

- Prenatal exposures to chlorpyrifos are associated with long-lasting effects, including poorer perceptual reasoning,[1] working memory[2] and intellectual development at seven years age.[3] One study linked prenatal exposure to a seven-point reduction in IQ by age seven[4] and another found that even very low levels of chlorpyrifos residues in cord blood resulted in lower IQ and reduced working memory.[5]
- A 2014 study from the University of California, Davis, found that pregnant women who lived up to a mile from fields treated with chlorpyrifos were 3.3 times more likely to have children with autism.[6]
- Chlorpyrifos is a suspected hormone-disrupting compound. Dietary exposure to organophosphate pesticides like chlorpyrifos, at levels common among U.S. children may also contribute to Attention Deficit Hyperactivity Disorder (ADHD).[7]

- Exposure also result from eating food contaminated with chlorpyrifos residues. Children eating conventionally produced foods have higher levels of chlorpyrifos in their bodies than children eating a primarily organic diet.[8]
- In 2016, the U.S. Environmental Protection Agency also concluded that chlorpyrifos residues put children at high risk, finding that for children 1–2 years of age, exposures from food exceed the EPA's safety threshold by 140 times.[9]

In the last several years, neonicotinoid pesticides (neonics) — both alone and in combination with other pesticides — have emerged as a key catalyst behind recent dramatic declines in pollinator populations, both because of their direct toxicity to bees and their indirect and cascading effects.

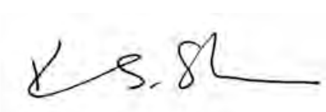
Even at low doses, neonics can cause harm to honey bee health over time. Impacts[10] include:

- Compromised immune response
- Shortened adult life cycles
- Impaired memory and learning
- Reduced social communication (reduces foraging efficacy)
- Disorientation, which also impairs foraging
- Delayed larval development and disrupted brood cycle
- "Gut" microbe disruption, leading to malnutrition

To help address these problems, PAN is joining public health advocates, farmworkers, environmentalists and concerned citizens across Oregon in supporting HR3058, which would ban chlorpyrifos and direct the Department of Agriculture to list neonics as restricted use. This bill would help protect health, the environment and food system, and we strongly urge you to support it.

Children, farmworkers, rural communities and our fragile ecosystems can't wait any longer for these needed protections.

Sincerely,



Kristin S. Schafer
Executive Director

1 Engel SM, Wetmur J, Chen J, Zhu C, Barr DB, Canfield RL, et al. 2011. Prenatal Exposure to Organophosphates, Paraoxonase 1, and Cognitive Development in Childhood. Env. Health Perspect. 119:1182- 1188. doi:10.1289/ehp.1003183

2 Rauh VA, Arunajadai S, Horton M, Perera F, Hoepner L, Barr DB, Whyatt R. Seven-year neurodevelopmental scores and prenatal exposure to chlorpyrifos, a common agricultural pesticide. Environ Health Perspect. 2011 Aug;119(8):1196-201.

3 Bouchard MF, Chevrier J, Harley KG, Kogut K, Vedar M, Calderon N, et al. 2011. Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year- Old Children. Env. Health Perspect. 119:1189-1195. doi:10.1289/ehp.1003185

4 Gunier RB, Bradman A, Harley KG, Kogut K, Eskenazi B. Prenatal Residential Proximity to Agricultural Pesticide Use and IQ in 7-Year-Old Children. Environ Health Perspect. 2017;125(5):057002 10.1289/EHP504

5 Rauh VA, Garfinkel R, Perera FP, et al. 2006. Impact of prenatal chlorpyrifos exposure on neuro- development in the first 3 years of life among inner-city children. Pediatrics 118(6). Available at www.pediatrics.org/cgi/ content/full/118/6/e1845

6 Shelton JF, Geraghty EM, Tancredi DJ, Delwiche LD, Schmidt RJ, Ritz B, Hansen RL, Hertz-Picciotto I. Neurodevelopmental disorders and prenatal residential proximity to agricultural pesticides: the CHARGE study. Environ Health Perspect. 2014 Oct;122(10):1103-9

7 Bouchard MF et al. 2010.Attention-deficit/hyperactivity disorder and urinary metabolites of organophosphate pesticides. Pediatrics 125:e1270. (http://dx.doi. org/10.1542/peds.2009-3058)

8 Bradman, Asa, Lesliam Quirós-Alcalá, Rosemary Castorina, Raul Aguilar Schall, Jose Camacho, Nina T. Holland, et al. Effect of Organic Diet Intervention on Pesticide Exposures in Young Children Living in Low-Income Urban and Agricultural Communities. *Env. Health Perspect.* 123, no. 10 (April 10, 2015). doi:10.1289/ehp.1408660.

9 Office of Chemical Safety and Pollution Prevention, U.S. EPA Memorandum, Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review, p. 6, November 3, 2016. Available at https://www.regulations.gov/document?D=EPA- HQ-OPP-2015-0653-0454

10 Pesticide Action Network. Issue brief: "Bees & Pesticides: Science Update," August 2015.

From:	Kristina Lefever
To:	Exhibits HAGLU
Subject:	Vote yes on HB 3058
Date:	Monday, March 25, 2019 10:06:08 AM

March 26, 2019

To the ***House Committee On Agriculture and Land Use:***

I am writing to you as president of Pollinator Project Rogue Valley, a small volunteer-run nonprofit in S OR.

I hope you have been hearing about the precipitous decline of insects worldwide. Numerous studies have been published about their staggering rate of disappearance. Just a few months ago, a published review of 73 studies concluded that “pollution from pesticides” is one of the primary causes. It’s hard to imagine, but over 40% of all insects have disappeared over the last 10 years, and we are on track to continue to lose them at the rate of 2.5% annually.

Oregon is renowned for its bounty of fruits and vegetables. What will farmers do this year and the next and the next as the insects that pollinate our crops disappear? Without pollination, we have no cherries and blueberries, no squash and pumpkins, no alfalfa and carrots. It is already happening - this year there has been a major shortage of honey bees to pollinate the almond orchards.

Neonicotinoids have been around since the early 90’s, and are the most widely used insecticides in the world.

Neonics are systemic, meaning they can’t be washed off the plant or fruit or vegetable. The neonic actually gets into the cells of the plants, making the plant toxic for insects. These systemic pesticides get into the pollen and nectar of the plant, and because the neonics remain in the plant for months and sometimes years, when the bees and butterflies sip from the flowers they are are ingesting the poison and also, in the case of bees, taking the toxic pollen and nectar back to their hive and nest.

People use neonics to try to get rid of pests like aphids, or white flies, but end up killing the good insects.

And it is not just the bees and butterflies. Neonics are also very harmful to birds. Birds can become disoriented, or even worse, die after being exposed to neonics.

Because neonics are water-soluble, they end up in streams and rivers. So, insects such as mayflies and caddisflies are affected, and therefore fish, like trout, who depend on those insects for food, will have fewer insects to eat. With fewer insects there will be fewer fish - which means fewer fish for people to eat. Unfortunately, testing is finding neonics in our streams in the Rogue Valley.

Oregon is renowned for its outdoor recreational opportunities. Would our tourism industry decline if we no longer have birds to watch and fish to fish?

I am a member of the Bellview Grange in Ashland, part of the Oregon State Grange system. In 2017, the Bellview Grange wrote a resolution that was adopted by the State Grange and its 4,000 members, and subsequently included in the Agricultural Policy of the National Grange. Here is the statement in the National Grange Policy that relates to these bills: “misuse via over-the-counter products has resulted in their increasing presence in water and wetlands. Their toxic effect on bee populations has reached the point where we feel it is time to consider designating Neonics as a restricted use pesticide.”

Please pass HB 3058 to protect insects, fish, birds, and people.
Consumers who lack the proper training and a license and must no longer be able to purchase products that contain neonicotinoids.
Farmworkers must no longer be exposed to chlorpyrifos, a known neurotoxin, and children should be able to eat fruits and vegetable every day without concern for their health.

The leaders of many cities and countries have already taken this step. It is time for the Oregon Legislative Assembly to vote yes on this bill.

> *Kristina Lefever*
> *President*
> *Pollinator Project Rogue Valley*
> *Phoenix, OR*

TO: Representative Brian Clem, Chair, Committee on Agriculture and Land Use
Members of the Committee

FR: Lindsey Cope
Mid Columbia Producers, Seedsman

Date: March 26, 2019

RE: Vote NO on HB 3058

Mid Columbia Producers is a major grain cooperative serving North Central Oregon. The seed department works with seed growers to produce certified seed for the area farmers to plant for the commercial export market. These seed fields are inspected and certified by us and Oregon Seed Certification for cleanliness and quality. MCP then cleans and treats this seed for the area farmers. We handle over half a million bushels of wheat and barley every year. Over 90% of the seed we treat is treated with a neonicotinoid product.

These treatments are a vital component of our farmers integrated pest management programs. Neonicotinoid seed treatments are the most effective and affordable solution to the pest issues our growers face. There are no alternatives that offer the same level of affordable control. For our seed production fields, control of wireworms that can affect the uniformity of the stand is an important part of weed control for overall field cleanliness. Commercial growers also depend on these for weed control as well as yield and quality protection. Once a seedling is lost to wireworm or aphid transmitted barley yellow dwarf virus, there is no getting it back. Our farmers rely on neonicotinoid products to protect their plants.

In the treating process, extreme care is taken to ensure the neonicotinoid product is handled in a safe way. The products are stored in sealed totes in a climate controlled room until application. The seed is treated on demand into the farmers truck. The products are applied directly to the seed as it goes up an auger. It takes less than 30 seconds for the product to be applied and dried on the seed. We also use fatty acid complexes in the treatment blends to ensure the treatment stays on the seed. The farmers then take this seed in a covered truck directly to the field to be planted. With these processes there is no risk to pollinators. The seed industry and farmers are also continuously being educated about these products and processes to maintain the best practices and ensure quality and safety.

Losing these products would be a detrimental hit to our area farmers. If we were without neonicotinoid products for even one growing season, we would be left with higher pest populations to control and inadequate control methods. Oregon has a reputation of high quality seed and commercial wheat that needs to be maintained.

From:	Lisa Ward
To:	Exhibits HAGLU
Cc:	Rep KenyGuyer
Subject:	Please support House Bill 3058
Date:	Tuesday, March 26, 2019 1:24:43 PM

Esteemed Legislators,

I would like to voice my support for House Bill 3058, which would have a significant and positive impact on the overall health and economy of the State of Oregon. There is no longer any room for doubt that Chlorpyrifos harm everything from our children's mental development to the very invertebrates and pollinators that sustain our agricultural yield. Similarly, the introduction and wide-spread use of Neonicotinoids has caused a catastrophic collapse on ecologies that support human life on earth. We have been silently witnessing the devastating consequences of these insecticides despite mounting evidence that they cause more harm then good.

Two weeks ago, 50 people were killed by armed terrorists at two mosques in Christchurch, New Zealand. Less than 1 week later, the weapons used in that attack were outlawed nation wide.

We have to act with equivalent speed. The decimation of insect populations that we are currently experiencing is an even more critical emergency on a global scale, in that it threatens all life on earth. We may not be able to identify every cause of the insect apocalypse, but we have to act swiftly to eliminate the causes we can identify. Chlorpyrifos and Neonicotinoids are two identifiable toxins that are having devastating consequences on our food chain at multiple levels. They need to be taken out of circulation immediately.

Beyond the known effects that Chlorpyrifos and Neonicotinoids are having on our health, the economic significance of losing more pollinators could easily cripple the State's economy. Insects are relied upon to pollinate at least three quarters of our food crops, a service estimated at easily $500 billion every year worldwide. As an example, in the Marxian Valley in China where shortages of insect pollinators have led farmers to hire humans workers at a cost of $19 per worker per day. Pollinating apple blossoms by hand is an epic undertaking. At best, one person can cover 5-10 trees a day. (https://nyti.ms/2DMT70v) California is currently facing similar challenges trying to pollinate almond orchards due to drastic die-offs in local bee hives.

Anthropologists believe that humans first began practicing agriculture around 12,000 years ago. For the vast majority of that time, food was grown without chemical pesticides. Never in that 12,000 years have we attempted to grow food without the help of insects. With 7 billion humans now living on earth, this seems like a particularly bad time to try such an experiment.

Please pass House Bill 3058. Many lives depend on it.

Sincerely,

Lisa Ward
Native Oregonian // Resident of SE Portland (97206)

From: Lucas Rue
To: Exhibits HAGLU
Subject: Please Oppose HB 3058 & SB 853 - maintain our pest management tools
Date: Tuesday, March 26, 2019 11:40:08 AM

Dear Chair Clem,

My name is Lucas Rue and I am part of our family's 2,000 acres grass seed farm just outside of Silverton, OR. We use chlorpyrifos on an annual basis in order to protect our crops from wire worms and sod web worms, two soil-bound creatures that have the ability to multiply quickly and destroy our crops if not controlled. Chlorpyifos is currently the only tool we have that controls insects that live in the soil, and if it is lost then we could potentially lose hundreds of thousands of dollars in crop revenue each year. If you know agriculture, then you're aware of the already challenging cash flow cycle. Removing chlorpyrifos from our management program will significantly decrease our profitability and could ultimately put us and other farms out of business. Grass seed is one of Oregon's top 5 commodities raising over $450 million in revenue annually. Please help protect Oregon agriculture and continue to allow the use of chlorypyrifos in our state. Thank you.

HB 3058 and SB 853 are unnecessarily banning chlorpyrifos which will remove this valuable pest management tool from Oregon's farmers. Chlorpyrifos has been used in cropping systems for over 4 decades, is authorized for use in nearly 100 countries and is labelled for use on more than 50 agricultural crops. These bills put Oregon growers, who must compete in the interstate and international markets, at a significant disadvantage.

Oregon farmers grow over 225 different crops, and chlorpyrifos is a vital tool on specialty crops when there is no alternative pesticide available. Keeping this tool available is critical to controlling crop-damaging insects in Oregon's Christmas trees, vegetables, mint, and many of our crops grown for seed such as clover, radish, and perennial grass.

HB 3058 and SB 853 also unnecessarily classifies all neonicotinoid products as Restricted Use in Oregon. In order to be classified as GENERAL USE by the U.S. Environmental Protection Agency, these products are required to clearly demonstrate their safety to mammals and birds. Oregon does not have any data that justifies limiting these products to licensed pesticide applicators only. Neonicotinoid products (over 625 registered in Oregon) are currently available to any user including farmers and homeowners. Neonicotinoids have been extremely valuable in Integrated Pest Management (IPM) systems to allow selectivity in controlling harmful pests while allowing beneficial insects to thrive.

Honey bees and other pollinators are very important, not only to agriculture, but also to the gardens and landscapes that people enjoy in both urban and rural environments. Over the last several years, many steps have been taken to protect pollinators at the state and federal level. The product labels are more restrictive, and Oregon is a leader in pollinator education through Oregon State University Extension. If pesticides are used as required by the product directions, the risks to pollinators are significantly reduced. It is not necessary to put such severe restrictions on this entire class of chemicals when other ways of addressing pollinator health are working.

Please join me in opposing HB 3058 and SB 853 to maintain current pest control tools and protect Oregon crops.

Sincerely,

Lucas Rue
1316 Victor Point Rd SE
Silverton, OR 97381
RUELUCAS@GMAIL.COM

GloryBee
FAMILY OWNED
· SINCE 1975 ·

Home of Aunt Patty's & GloryBee Products

120 N. Seneca Road
PO Box 2744
Eugene, OR 97402

office: (541) 689-0913
fax: (541) 607-2156
GloryBee.com

March 26, 2019

House Committee On Agriculture and Land Use
Oregon Legislature
900 Court Street NE
Salem, OR 97301

RE: Support for HB 3058

Dear Chair Clem and Representatives McLain, Post, Boshart Davis, Helm, Smith and Williams:

GloryBee is a family owned and operated business in Eugene that has been supplying honey, sweeteners and other quality ingredients to natural food manufacturers, bakeries and supermarkets in the Pacific Northwest for over forty years. Started in 1975, in the garage of beekeepers and founders Dick and Pat Turanski, today the next generation of the Turanski family is very intentionally giving back to address the plight of honeybees.

Honey bees are critical to a healthy and abundant food supply. GloryBee's SAVE the BEE Program is fostering public awareness, educating beekeepers and partnering with food and beverage manufacturers in raising funds to support scientific research on honey bee health (specifically research labs at Oregon State University and Washington State University).

I am speaking today on behalf of GloryBee, a company that makes about one third of its livelihood selling honey and beekeeping equipment, but also I believe I am speaking on behalf of honey bees, beekeepers, fruit and vegetable farmers and our food supply.

What do we know?

- **One in three bites of food we currently eat is pollinated (by bees or others)**
  Think apples, cranberries, blueberries, melons, squash, almonds and avocados to name a few! Without pollinators these crops will die off. (pollinator.org), Honey bees provide $20 billion worth of pollination services annually in the US. (modernag.org/biodiversity/beeconomy-economic-value-pollination/)
- **Honey bees are a multimillion dollar business in Oregon.**
  Oregon is in the top 6 states with the highest number of managed honey bee hives (95,000 colonies according to the USDA), with approximately 20 commercial (500+ hives) and semi-commercial (50 to 500) outfits and 220-300 backyard beekeepers (5 to 50 hives). (pnwhoneybeesurvey.org, beeinformed.org)

GloryBee
FAMILY OWNED
· SINCE 1975 ·

Home of Aunt Patty's & GloryBee Products

120 N. Seneca Road
PO Box 2744
Eugene, OR 97402

office: (541) 689-0913
fax: (541) 607-2156
GloryBee.com

- **Most of Oregon's commercial beekeepers generate additional revenue by leasing their hives to California almond growers.**
  So what may seem like a small economic driver in Oregon, is tightly linked to keeping the enormity of the California almond industry viable ($21.5 billion)
- **Honey bee colony loss is well documented in Oregon**, as elsewhere across the country, and has ranged from 15 to 45% in the last decade. In 2017-2018, Oregon backyard beekeepers experienced 35% colony loss and commercial beekeepers 15%. (pnwhoneybeesurvey.org, beeinformed.org)
- **Varroa mites, queen failure, and general hive weakness** in the fall have been the perceived reasons for colony loss in Oregon. Why are queens failing? Why are hives weak at the end of a summer season when they have plenty of food stores (pollen and honey)?
- **Neonicotinoids are the most widely used class of insecticides in the world.** Their persistent presence in soil and plants makes it possible for these chemicals to contaminate pollinators even when the initial application is made outside of the flowering season. When bees drop dead after spraying, it's easy to see cause and effect. Our concerns are also for the sublethal effects.

Recent science that is shedding light on the complexities of pesticides and the health of bees:

1. ***Neonicotinoid adversely affects insect immunity from viral pathogens in honey bees*** (DiPrisco et. Al., 2013) Honey bees are exposed to a wealth of synergistically interacting stress factors, which may induce colony losses often associated with high infection levels of pathogens. Here we show that the neonicotinoid insecticide clothianidin adversely affects honey bee antiviral defenses.

2. ***Neonicotinoid insecticides can serve as inadvertent insect contraceptives*** (Straub et. al., 2016) When exposed to chronic field-realistic, non-lethal concentrations of two forms of neonicotinoids, the reproductive capacity of male honey bees was significantly reduced. Their sperm quantity and viability declined by 39%.

3. ***Impaired associative learning after chronic exposure to pesticides in young adult honey bees.*** (Goñalons and Farina, 2018) The neonicotinoid imidaclopridhad had adverse effects on different aspects of young honey bee appetite and eating behaviors, which could have repercussions for food distribution, propagation of olfactory information and task coordination within the hive.

GloryBee
FAMILY OWNED
· SINCE 1975 ·

Home of Aunt Patty's & GloryBee Products

120 N. Seneca Road
PO Box 2744
Eugene, OR 97402

office: (541) 689-0913
fax: (541) 607-2156
GloryBee.com

The case for caution – restrict Neonicotinoids!
Oregon currently requires certification and training in order to buy, sell, or disseminate over 500 restricted use pesticides, yet no neonicotinoids are included on the list.

With full-cost accounting, we can compare the trade-offs between pollinator conservation and other reasonable objectives. For example, we know that neonicotinoid pesticides were developed to aid farmers, and Oregon's wheat industry in particular is benefiting from their use. The availability and cost effectiveness of non-chemical alternatives may not be ideal for wheat farmers at this time, but non-chemical alternatives certainly exist for the backyard gardener.

This is precisely why we believe it is prudent to restrict use of neonicotinoids to licensed and trained professionals who are educated about pollinator habits and habitats, and to get neonics off the retail shelves and out of backyards.

Please support HB 3058. Without honey bees and other native pollinators we all lose.

Sincerely,

Lynne Fessenden

Lynne Fessenden
SAVE the BEE Program Coordinator

Di Prisco, G., Cavaliere, V., Annoscia, D., et al., 2013. Neonicotinoid clothianidin adversely affects insect immunity and promotes replication of a viral pathogen in honey bees. Proc. Natl. Acad. Sci. U. S. A. 110, 18466–18471.

Straub, L. et. al,. 2016. Neonicotinoid insecticides can serve as inadvertent insect contraceptives. Proc. R. Soc. B 283: 20160506. http://dx.doi.org/10.1098/rspb.2016.0506

Mengoni Goñalons C, Farina WM, 2018. Impaired associative learning after chronic exposure to pesticides in young adult honey bees. J Exp Biol. Apr 11; 221.

Sponsler, D.B., et.al., 2019, Pesticides and pollinators: A socioecological synthesis Science of the Total Environment 662, 1012–1027.

From:	Margaret Magruder
To:	Exhibits HAGLU
Subject:	HB 3058/SB 853
Date:	Monday, March 25, 2019 10:20:13 AM

Dear Chair Clem,

Dear Senator Dembrow and Representative Clem,

My family has been engaged in agriculture in Oregon for over 100 years. We have witnessed the tools needed for economically viable agriculture gradually being removed from use and hampering farmers and ranchers ability to survive much less thrive.

Oregon's land use regulations encourage no net loss of farm land, however bills such as HB 3058 and SB 853 send an entirely different message to farmers.

I have served on the Oregon Board of Agriculture and am a member of the Oregon State Weed Board and I am familiar with the regulations that ODA has in place to monitor pesticide products. We need to rely on the experts on the state and federal level to make the appropriate decisions in regard to these products.

Please support Oregon Agriculture and oppose HB 3058 and SB 853.

Sincerely,

Margaret Magruder
12589 Highway 30
Clatskanie, OR 97016
magruder@clatskanie.com

Bashaw LAND and SEED INC.

March 26, 2019

House Committee on Agriculture and Land Use

RE: HB 3058 – **OPPOSED**

Chair Clem and Committee,

My name is a Marie Bowers and I am fifth generation farmer in Linn & Lane Counties. We primarily grow grass seed with a variety of other seed crop. My family takes great pride in being responsible stewards of the land and the soil that grows our crops. We have done so sustainably for over 100 years, in spite of the challenges the legislature deals us. We live on the same land and drink the water that's filtered through the soil.

I am **opposed to HB 3058**, the ban on Chlorpyrifos and the move to make neonicotinoids restricted use.

Insecticide use increased on our farm after 2009. With the loss of field burning as a pest management tool we replaced it with another, in this case chlorpyrifos. To remain sustainable, we need to keep as many tools in our toolbox as possible.

Chlorpyrifos is strictly regulated and requires a pesticide applicator license for purchase. It is one of the most effective insecticides available. This allows for us to go over the field once rather than multiple times with less effective tools; reducing our soil compaction and carbon footprint.

I am a licensed pesticide applicator and I take that privilege very seriously. This means I read the label and do not violate it. Like most applicators, I am the rule, not the exception.

As a new mom I too am concerned about the potential negative health effects on humans. However, when used as directed according to the label including using the proper protection as directed by the label, the risk is minimal. This gives me confidence to raise my baby in the middle of a grass seed field and drink the water, just as my family has done for over 100 years.

Neonicotinoids are also a vital part to public health and should not have a restricted use label. Considering dogs are a person's best friend, they should be able to be treated for fleas without requiring their owner to have a license. They are also used to control bed bugs. It's a matter of public health and when used as directed by law pollinators are safe.

They are also used in seed treatments, so we do not have to spray fields later. This is a more targeted option rather than broadly spraying an insecticide and saves us a trip over the field.

Honey bees are a vital part to our farm and they pollinate our meadowfoam. Communication is key with our beekeeper so that we make sure the bees are healthy and happy. Oregon State publishes a booklet and phone app that helps us ensure we are being responsible applicators around pollinators.

Taking away tools from farmers without offering viable alternatives is a quick way to make farms unsustainable.

Please OPPOSE HB 3058.

Testimony to the Oregon House Agriculture & Land Use Committee
RE: HB 3058

Mark Dickman
Silverton, Oregon

March 26, 2019

Good afternoon. My name is Mark Dickman. I am testifying today in opposition to House Bill 3058, which, if adopted would negatively impact Oregon's farmers.

My family and I operate a family-owned farm east of Mt. Angel. My grandfather bought the farm in 1929, and it has been passed down through the generations. I grew up on our farm, and my wife and I have raised our children in and around our fields. When I first started farming the land with my parents, our farm was 200 acres. We have grown our farming operation substantially, and today it is approximately 2,700 acres. We grow onions, cauliflower, and snap beans, in rotation with turf grass seed crops. Winter wheat is grown some years, depending on our rotation in a particular field. We also have approximately 40 acres of hazelnuts. Our farm employs 8 people year around, and as much as 25 workers on a seasonal basis; they are crucial to our success, and our most valued asset. We own less that 1/3 of the acres we farm; the rest is leased from approximately 40 landlords. Many of these people are retired, and depend on our annual rent payments to them for a significant part of their income. They also trust us and rely on us to take good care of their farms, stewarding resources that have often been in their families longer we've farmed. Make no mistake, we are in business to make a profit, but to do so also requires a significant commitment, financial and otherwise, to a large group of people who depend on us to do the right thing.

We have been early adopters of new products and techniques, using the latest in knowledge and skill to produce our crops in a sustainable, environmentally responsible way. Our farm was the statewide winner of the Oregon Wheat Growers League’s Conservation Farm of the Year award in 1997, has passed the NORPAC Foods, Inc. stewardship audit (including Food Alliance certification) since 2005, has passed Unilever’s worldwide “Muddy Boots” sustainability audit, has passed the American Institute of Baking’s sustainability audit as a grower for National Frozen Foods, and has passed GAP audits (administered by Oregon Department of Agriculture) the past six years for our onion production. We have done this, in part, by using the best practices to reduce our nutrient and pesticide footprint. Examples include, for instance, pre-sidedress nitrogen testing, sampling to predict the severity of garden symphylan infestations, and regular monitoring of pests, to prescriptively use pest controls. I cite these awards, certifications, and practices not to brag, but to illustrate our credentials with regard to responsible pesticide use.

Without chlorpyrifos in our toolbox, many of our crops are at risk of not being economically viable. We, along with other farmers in our area, have experienced field loss as a result of insect pests. Any loss of yield could force our farm out of business on that crop. That's why I think SB 853 is a mistake.

We use chlorpyrifos as an “over-the-top” treatment at planting time to control onion maggots. An infestation of maggots can severely damage, or even wipe out, a planting of onions. Onions are our highest value crop; chlorpyrifos is the only product available that effectively controls onion maggots. Loss of chlorpyrifos could prevent us from growing the crop that provides over a quarter of our gross farm income. Onions are a high value crop, with opportunity for excellent profit, if the market "cooperates" (if the market doesn't "cooperate," they generate fantastic losses!). They are also a high input crop: Our direct costs per acre to plant, grow and harvest are five times the direct costs to produce and acre of grass seed. Because of this, we must consider all our risks carefully. If we don't have chlorpyrifos in our pest control toolbox, we may choose to not plant the crop at all.

We also use chlorpyrifos (as Lorsban Advanced) as a pre-plant soil treatment in our cauliflower transplant seedbeds. Treating a seedbed (approximately 1 acre of seedbed produces transplants for 50+ acres of field production) gives us control of root maggot, and suppresses garden symphylans; either can damage or destroy cauliflower plants. Taking "clean" plants (without root maggot infestation) to the field is our first line of defense for controlling root maggot.

In addition, we use chlorpyrifos (as Lorsban 75WG) as an "over-the-row" treatment in transplanted cauliflower, to control root maggot, cutworms, and aphids. Cauliflower is our second-highest value per acre crop; loss of this important insect control tool would result in root maggot damage severe enough to make this crop economically unfeasible, putting us out of the cauliflower business. Cauliflower represents 10-15% of our gross farm income.

Chlorpyrifos is used as a seed treatment on all of the bean seed that we plant. It is important to protect our young plants from root-feeding insects. Chlorpyrifos works well, and eliminates the need for further treatments, at what would be much higher per-acre rates. Although snap beans are not a high-margin crop for us, they do represent 15–20% of our gross farm income, and have a significant place in our rotation, particularly as we plant prior to planting grass seed crops.

I have other concerns regarding this bill, and its potential impact on Oregon agriculture:

- First, I believe it is a mistake to legislate product by product. Oregon farmers will be the direct losers. We must maintain a uniform pesticide regulatory system across the county. It is important for a level playing field and for our export competitiveness. Oregon Department of Agriculture already has the authority to implement state specific regulations regarding pesticide use and labels. They have used this authority judicially, but also effectively where needed.

- Second, the success of Oregon agriculture is due in no small part to its diversity. If this legislation is adopted, and makes production of one or more of my crops unprofitable, it will reduce the crop choices available to me and my neighbors. It will have a significant impact on vegetable growers, who already face unique pest challenges with limited tools available. Make no mistake, I will farm the ground, but it will just be more acres of a less profitable crop. This does not promote economic growth.

- Third, there would be irony in this if I couldn't use chlorpyrifos: Our main outlet for onions is Curry & Company in Brooks. They try to purchase onions locally, because the supermarkets they sell to are more and more requesting local foods. If they can't source Willamette Valley onions, they will bring them in from other areas, like eastern Washington. Onions that have been produced with chlorpyrifos will still be in our local supermarkets, offered for sale to Oregon consumers.

Our farm has been in business for 90 years; we're now operated by the third and fourth generations, and intend to be in business producing food for many years to come. We have over 30 years of experience using products containing chlorpyrifos. We must continue to have chlorpyrifos available for our use, and I am confident we can continue to use this product, as we use all pesticides, responsibly. I urge you to NOT support HB 3058. Thank you for your consideration, and for your time today.

From:	Matt Hutchinson
To:	Exhibits HAGLU
Subject:	Please Oppose HB 3058 & SB 853 - maintain our pest management tools
Date:	Monday, March 25, 2019 11:20:07 AM

Dear Chair Clem,

As the Manager of Baker Valley Vector Control District, and the President of Oregon Mosquito and Vector Control Association, my colleagues and myself are in opposition of HB 3058 and SB 853. Pest control professionals and farmers already face heavy pesticide regulations and limited options to control pests and vectors that present dangers to the public. Banning and removing pesticides from a users already limited toolbox sets a dangerous precedence. We must rely on science experts and regulators at our state and federal agencies like the EPA and Department of Agriculture to make these decisions, and not allow legislators to make pesticide use decisions product-by-product.

HB 3058 and SB 853 are unnecessarily banning chlorpyrifos which will remove this valuable pest management tool from Oregon's farmers. Chlorpyrifos has been used in cropping systems for over 4 decades, is authorized for use in nearly 100 countries and is labelled for use on more than 50 agricultural crops. These bills put Oregon growers, who must compete in the interstate and international markets, at a significant disadvantage.

Oregon farmers grow over 225 different crops, and chlorpyrifos is a vital tool on specialty crops when there is no alternative pesticide available. Keeping this tool available is critical to controlling crop-damaging insects in Oregon's Christmas trees, vegetables, mint, and many of our crops grown for seed such as clover, radish, and perennial grass.

HB 3058 and SB 853 also unnecessarily classifies all neonicotinoid products as Restricted Use in Oregon. In order to be classified as GENERAL USE by the U.S. Environmental Protection Agency, these products are required to clearly demonstrate their safety to mammals and birds. Oregon does not have any data that justifies limiting these products to licensed pesticide applicators only. Neonicotinoid products (over 625 registered in Oregon) are currently available to any user including farmers and homeowners. Neonicotinoids have been extremely valuable in Integrated Pest Management (IPM) systems to allow selectivity in controlling harmful pests while allowing beneficial insects to thrive.

Honey bees and other pollinators are very important, not only to agriculture, but also to the gardens and landscapes that people enjoy in both urban and rural environments. Over the last several years, many steps have been taken to protect pollinators at the state and federal level. The product labels are more restrictive, and Oregon is a leader in pollinator education through Oregon State University Extension. If pesticides are used as required by the product directions, the risks to pollinators are significantly reduced. It is not necessary to put such severe restrictions on this entire class of chemicals when other ways of addressing pollinator health are working.

Please join me in opposing HB 3058 and SB 853 to maintain current pest control tools and protect Oregon crops.

Sincerely,

Matt Hutchinson
PO Box 585
Baker City, OR 97814
bvvcd@thegeo.net

Chair Michael Dembrow, Senate Environment & Natural Resources Committee
Chair Brian Clem, House Agriculture & Land Use Committee

HB 3058 and SB 853: BANS CHLORPYRIFOS AND CLASSIFIES NEONICOTINOID INSECTICIDES AS RESTRICTED USE.

March 25, 2019

Chairs Dembrow, Clem and Committee Members,

HB 3058 and SB 853 open the door to legislators making pesticide use decisions product-by-product instead of relying on the scientists and regulators at our state and federal agencies. This concerns me since perception of risk is dictating this legislation and not facts.

This legislation will completely ban the sale, distribution and use of all pesticide products containing chlorpyrifos. Chlorpyrifos can play a unique and important role in insect pest management in hazelnut orchards. While it may not be used every year, compared to other pest management tools, chlorpyrifos acts against a broad range of pests. On those years where insect pressure may be very high, it can be used within a rotation to manage insect resistance.

An additional concern is how HB 3058 and SB 853 will impact Oregon exports. Other countries and states have strong phytosanitary requirements. Hazelnut shipments exported to international markets can face rejection if an infestation of pests, such as the filbertworm, is found.

Chlorpyrifos and neonicotinoid insecticides are important components of Integrated Pest Management (IPM) programs. This approach utilizes pesticides as well as other tools to control pests. Growers may not use a product much or at all for a year or two, and then when insect population pressures change, we must look to that product again to save our crop and investment.

I would appreciate that the committee look past perceptions and talk to those individuals who manage our natural resources. I ask you to vote NO on HB 3058 and SB 853.

Thank you for the opportunity to write to you today.

Sincerely,

Matt Schuster

From: Matthew Schuster
To: Exhibits HAGLU
Subject: HB 3058 and SB 853
Date: Tuesday, March 26, 2019 10:20:07 AM

Dear Chair Clem,

Dear Chair Brian Clem and Michael Dembrow,

HB 3058 and SB 853 open the door to the legislators making pesticide use decisions product-by-product instead of relying on the scientists and regulators at our state and federal agencies.

HB 3058 and SB 853 will completely ban the sale, distribution and use of all pesticide products containing chlorpyrifos, and they will require a pesticide applicator license to purchase or use a neonicotinoid product. These insecticides are needed to by Oregon farmers to protect our food supply and meet the needs of a growing population.

Many of Oregon’s specialty crops have state-approved Special Local Need (SLN) registrations for chlorpyrifos since there are no alternative products available for certain pests. The unique nature of Oregon’s diverse agriculture results in very few, if any, products available for controlling pests for some crops. Chlorpyrifos is vital for protecting Oregon’s specialty crops.

HB 3058 and SB 853 will impact Oregon exports. Other countries and states have strong phytosanitary requirements. These bills take away a tool used to meet those requirements for crops with few if any alternatives.

Additionally, public health programs will not have the tools needed to control invasive insect populations.

These bills restrict the use of neonicotinoid products to licensed pesticide applicators. Many farmers are not currently licensed as they do not use Restricted Use pesticides. This would require farmer to obtain a pesticide applicator license. The bill also takes hundreds of effective and easy to use products away from homeowners and gardeners.

Chlorpyrifos and neonicotinoid insecticides are important components of Integrated Pest Management (IPM) programs and Insect Resistance Management programs. Use of IPM cropping systems and preventing pest resistance can lead to more sustainable agriculture and reduced farming costs, allowing farmers to minimize production costs while supporting a sustainable food supply.

Please support Oregon farmers and vote NO on HB 3058 and SB 853.

Sincerely,

Matthew Schuster
2181 Waconda Rd NE
Gervais, OR 97026
mattanddestinee@gmail.com

Icahn School of Medicine at Mount Sinai

Megan K. Horton, PhD, MPH
Department of Environmental Medicine and Public Health

One Gustave L. Levy Place
Box 1057
New York, NY 10029
T 212-241-5959

March 26, 2019

Re: HB-3058
Submitted to: The Senate Environment and Natural Resources Committee
Position: In support of HB-3058

Dear Members of the Committee,

I am an Assistant Professor in the Department of Environmental Medicine and Public Health at the Icahn School of Medicine at Mount Sinai in New York. As an environmental epidemiologist, my research seeks to understand the relationship between early life exposure to environmental toxicants and adverse neurodevelopmental outcomes, including changes in children's brain structure and function. It is increasingly recognized that prenatal and early childhood exposures to environmental toxicants such as chlorpyrifos are contributing to the growing rates of neurodevelopmental disorders. Recent advances in brain imaging including magnetic resonance imaging (MRI) have opened unprecedented access to study the developing human brain and understand the impact of environmental chemicals on the typical developmental trajectory. Discussed in detail below, research conducted leveraging these advances demonstrates the persistent impact of prenatal chlorpyrifos exposure on children's brain structure. I am providing this written testimony as an environmental health expert and as a leading researcher in the studies addressing the adverse neurodevelopmental health outcomes associated with early life chlorpyrifos exposure. As a researcher at Columbia University, I contributed to the Columbia studies that you may hear opponents' question. I strongly support the passage of House Bill 3058 to ban all uses of chlorpyrifos in the state of Oregon. <u>Consistent</u> evidence across animal studies and epidemiological studies demonstrate that chlorpyrifos is a powerful developmental neurotoxicant and that early life exposure to chlorpyrifos is associated with <u>persistent</u> adverse outcomes in children including changes in brain structure. I believe this bill is essential to help protect the health of Oregon's most vulnerable populations, pregnant women and children.

The scientific evidence of neurotoxic dangers associated with chlorpyrifos exposure is extensive and consistent. Three recent epidemiologic studies demonstrate that exposure to chlorpyrifos during pregnancy is harmful to children's brains and that damage associated with early life exposure persists throughout childhood.[1-3] These three studies, based on different populations, located in distinct geographical regions of the US, with different routes of exposure, and using different biomarkers of exposure, have produced strongly convergent results. One study from the University of California at Berkeley reported reductions in IQ scores among the children of agricultural workers in the Salinas Valley.[1] The second study was undertaken at my institution, the Icahn School of Medicine at Mount Sinai, and found similar results in a New York City Hispanic population, whose exposures were largely residential.[2] The third study, also conducted in New York City by investigators at Columbia University among a population of African-American and Dominican children determined that prenatal chlorpyrifos exposure negatively impacted children's brain development.[3] These studies all support the need to protect children from early life exposure to chlorpyrifos.

Building upon these epidemiologic studies demonstrating associations between early life chlorpyrifos exposure with behavioral and cognitive outcomes in children, Columbia University undertook an MRI study to inform our understanding of the influence of prenatal and early childhood chlorpyrifos exposure on brain regions regulating behavior and cognition in children.[4] In this work, I and the other researchers evaluated the brains of 40 children, ages 5 to 11, whose mothers were enrolled during pregnancy into the Columbia University Mother's and

Newborn's Study. This is a non-clinical, representative community-based cohort enrolled from Northern Manhattan and the South Bronx in New York City. We compared the brain scans of 20 children with higher levels of chlorpyrifos exposure (as measured in umbilical cord blood collected at birth) to 20 age- and sex- matched control subjects with lower chlorpyrifos levels. The brain scans of children with higher chlorpyrifos exposure looked markedly different compared with those of children exposed to lower levels of chlorpyrifos. Changes were visible across the surface of the brain, with abnormal enlargements of some areas and thinning in others. The regions affected are associated with functions such as attention, decision making, language, impulse control and working memory. These changes in brain structure are consistent with the cognitive and behavioral deficits observed in children exposed to this chemical, as well as consistent with animal literature linking early life exposure to low levels of these chemicals to adverse neurodevelopmental outcomes.

In addition, the high chlorpyrifos group also displayed disruption of normal sexual differences in brain structure – features that were preserved in the low chlorpyrifos group. Expected sex differences (i.e., enlargement of the right inferior frontal lobe) were reversed in the high chlorpyrifos group. These findings are consistent with animal models suggesting that chlorpyrifos exposure reverses normal sexual differences in learning, memory and emotional behaviors.

Notably, the adverse cognitive and motor outcomes and the brain abnormalities observed in these studies appeared to occur following low-level exposures to chlorpyrifos in non-occupationally exposed, community-based samples. These exposure levels are below EPA safety standards.[5] This suggest that the mechanisms underlying brain changes may involve other pathways and occur at lower levels than anticipated based on systemic toxicity. The current EPA safety standards do no protect vulnerable populations such as the developing infant and small child from the adverse impacts of this neurotoxicant.

This critical study demonstrates that residential exposure to chlorpyrifos in a non-clinical, community-based sample is associated with persistent changes in the morphology of brain regions that support cognitive and behavioral outcomes. These associations occur at levels below the threshold for systemic toxicity suggesting that the fetal and developing brain is uniquely vulnerable to this chemical. These findings, together with decades of animal and epidemiologic research confirm the toxic dangers posed by exposure to even low levels of chlorpyrifos.

The economic costs associated with neurodevelopmental problems cannot be ignored. It is estimated that, on average, it costs twice as much to educate a child with learning or developmental disabilities in the U.S. compared to the costs associated with educating children without these disabilities.[6] A recent analysis in the European Union reported that annual costs linked to the loss of IQ points and learning disabilities due to chemical exposures, including OP pesticides, were estimated to be $169.43 billion dollars.[7] The detrimental effects of the OP chlorpyrifos on health place children and other vulnerable populations at a clear disadvantage, limiting their ability to become contributing members of our society and resulting in economic consequences to our state and our nation.

In summary, the science is clear and consistent: chlorpyrifos is putting the health of our children and other vulnerable populations at risk .I strongly support the passage of House Bill 3058 to ban all uses of chlorpyrifos in the state of Oregon and urge our decision makers to not dismiss the use of sound science and the current weight of the evidence in decision-making to promote and ensure public health.

Megan K. Horton
Assistant Professor, Environmental Medicine and Public Health
Icahn School of Medicine at Mount Sinai

References:

1. Bouchard M.F., Chevrier J., Harley K.G., Kogut K., Vedar M., Calderon N., Trujillo C., Johnson C., Bradman A., Barr D.B., and Eskenazi B., *Prenatal exposure to organophosphate pesticides and IQ in 7-year-old children.* Environ Health Perspect, 2011. **119**(8): p. 1189-95.
2. Engel, S.M., Wetmur J, Chen J, Zhu C, Barr DB, Canfield RL, Wolff MS. Prenatal exposure to organophosphates, paraoxonase 1, and cognitive development in childhood. Environ Health Perspect. 2011. Aug;119(8):1182-8.
3. Rauh V.A., Perera F.P., Horton M.K., Whyatt R.M., Bansal R., Hao X., Liu J., Barr D.B., Slotkin T.A., and Peterson B.S., *Brain anomalies in children exposed prenatally to a common organophosphate pesticide.* Proc Natl Acad Sci U S A, 2012. **109**(20): p. 7871-6.
4. Rauh V, Arunajadai S, Horton M, Perera F, Hoepner L, Barr DB, Whyatt R. Seven-year neurodevelopmental scores and prenatal exposure to **chlorpyrifos**, a common agricultural pesticide. Environ Health Perspect. 2011 Aug;119(8):1196-201. Apr 21.
5. Bellanger M., Demeneix B., Grandjean P., Zoeller R.T., and Trasande L., *Neurobehavioral deficits, diseases, and associated costs of exposure to endocrine-disrupting chemicals in the European Union.* J Clin Endocrinol Metab, 2015. **100**(4): p. 1256-66.
6. Chambers JG P.T., Harr JJ. What Are We Spending on Special Education Services in the United States, 1999-2000? Washington, DC: American Institutes for Research. Available: http://www.csef-air.org/publications/seep/national/AdvRpt1.pdf. Accessed: February 25, 2019. 2004.
7. U.S. EPA. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. US Environmental Protection Agency Washington, DC; 2016. Document ID: EPA-HQ-2015-0653-0454. Available from: https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454.

Megan K. Horton, PhD, MPH *is an Assistant Professor of Environmental Medicine and Public Health at the Icahn School of Medicine at Mount Sinai.*

Dr. Horton is an environmental health scientist with expertise in environmental epidemiology, child neurodevelopment and pediatric neuroimaging. Following her doctoral training in environmental health at Columbia University, she completed a postdoctoral fellowship in neuroepidemiology where she learned to apply magnetic resonance imaging (MRI) to investigate the impact of prenatal exposure to pesticides and secondhand smoke on neuropsychological and behavioral function throughout childhood. In 2010, she received a prestigious NIH-funded career transition award to study co-exposure to endocrine disrupting chemicals (e.g., polybrominated flame retardants, perchlorate, pyrethroid insecticides) and structural and functional brain outcomes in a New York-based longitudinal birth cohort. This award included extensive training in study design and statistical approaches for linking early life exposures to complex chemical mixtures with neuroimaging data to evaluate changes in brain structure and function in children. Her work has been highlighted at national and international meetings.

Raszka Shelley

From: Michael McLaughlin <mackie.mclaughlin@gmail.com>
Sent: Thursday, March 21, 2019 8:26 AM
To: Exhibits HAGLU
Subject: HB 3058 SN 853

Dear Chair Clem,

Please Vote No on HB 3058 and SN 853 without these Insecticides it would be Devastating To All Oregon FARMERS! So Please SUPPORT OREGON FARMERS AND VOTE NO. Thank You

Sincerely,

Michael McLaughlin
13951 SW Peavine Rd
McMinnville, OR 97128
mackie.mclaughlin@gmail.com

WILBUR-ELLIS AGRIBUSINESS

Chlorpyrifos Uses in Oregon

- **Grasses for seed (critical use)**
  - Cutworms
  - Armyworms
  - Sod webworms
  - Billbugs
  - Aphids
  - Symphylans
  - Wireworms
- Clover Seed
  - Aphids
  - Weevils
- Hazelnuts
  - Aphids
  - Leafrollers
  - **Trunk borers (critical use very few chemistries labeled for this use)**
  - Filbert worms
- Brassica crops
  - Symphylans
  - **Root Maggots (critical use need every tool we can have)**
  - Cutworms
  - Armyworms
  - Wireworms
- Onions
  - **Onion Maggots (critical use)**
- Field Corn and Sweet Corn
  - Symphylan
  - Cutworms
  - Armyworms
  - Seed Corn maggots
- Alfalfa
  - Weevil
  - Aphids
- Mint
  - Cutworms
  - **Symphylans (critical use)**

- Wheat
  - Aphids
  - Cereal Leaf Beetle
- **Christmas trees (critical use few labels for these pests)**
  - Aphids
  - Doug Fir Needle Midge
  - Adelgid
  - Mites
  - Root maggots
  - Weevils
- Carrot Seed
  - Aphids
- Tree fruit
  - **Trunk borers (critical use very few trunk spray options or any options for borers)**
- Trees Grown for Pulp or Wood
  - Webworms
  - Tentworms
  - Trunk borers
  - Leafrollers
- Strawberry
  - **Symphylans (critical use only product labeled for this application)**
  - Crown borers

- **Critical uses for particular pest**
  - Borer pests Trunk and Crown
  - Symphylans
  - Root Maggots
  - Cutworms
  - Needle Midge
  - Weevil

Foliar

GROUP 4A INSECTICIDE

ASSAIL® 70WP
INSECTICIDE

For Agricultural Use Only

ACTIVE INGREDIENT:	By Wt.
Acetamiprid, (E)- N[1] -[(6-chloro-3-pyridyl)methyl]-N[2]-cyano-N[1]-methyl acetamidine	70.0%
OTHER INGREDIENTS:	30.0%
TOTAL:	100.0%

EPA Reg. No. 8033-23-70506

KEEP OUT OF REACH OF CHILDREN

CAUTION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID	
IF SWALLOWED:	• Immediately call a poison control center or doctor for treatment advice. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Have person sip a glass of water if able to swallow. • Do not give anything by mouth to an unconscious person.
IF IN EYES:	• Hold eye open and rinse slowly and gently with water for 15 – 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. • Call a poison control center or doctor for treatment advice.
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 – 20 minutes. • Call a poison control center or doctor for treatment advice.
IF INHALED:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for treatment advice.
Have the product container or label with you when calling a poison control center or doctor or going for treatment.	
NOTE TO PHYSICIAN: There is no specific antidote. All treatment should be based on observed signs and symptoms of distress in the patient. Overexposure to materials other than this product may have occurred.	

EMERGENCY TELEPHONE NUMBERS:
CHEMTREC: (800) 424-9300 • MEDICAL: (866) 673-6671 Rocky Mountain Poison Control Center

I
INSECTICIDE

NET WEIGHT: ____________

UPI

Sold by: **United Phosphorus, Inc.** • 630 Freedom Business Center, Suite 402 • King of Prussia, PA 19406 U.S.A. • 1-800-438-6071

PRECAUTIONARY STATEMENTS

CAUTION

HAZARDS TO HUMANS and DOMESTIC ANIMALS

Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Harmful if inhaled. Avoid breathing vapors or spray mist. Keep out of reach of children and domestic animals.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Mixers, loaders, applicators, and other handlers must wear long-sleeved shirts, long pants, shoes plus socks, chemical resistant gloves made of the following waterproof material: nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, barrier laminate, polyvinyl chloride (PVC) ≥ 14 mils, or viton ≥ 14 mils and chemical resistant headgear for overhead exposure.

In addition to the above, for aerial applications, mixers and loaders must wear a filtering face piece, half piece or full face NIOSH approved particulate respirator (TC-84A) with any R or P filter.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This product is toxic to birds and aquatic invertebrates. This product is toxic to bees exposed to direct treatment. Do not apply this product while bees are foraging in the treatment area. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate. Do not contaminate water used for irrigation or domestic purposes.

GROUND WATER ADVISORY

This chemical has properties and characteristics associated with chemicals detected in ground water. This chemical may leach into ground water if used in areas where soils are permeable, particularly where the water table is shallow.

SURFACE WATER ADVISORY

This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having high potential for reaching surface water via runoff for several months or more after application. Avoid accidental or intentional application of this product to ditches, swales, drainage ways or impervious surfaces such as driveways. Runoff of this product to surface water will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

Read entire label before using this product.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

(continued)

AGRICULTURAL USE REQUIREMENTS *(continued)*

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is coveralls, waterproof gloves and shoes plus socks.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE

Store unused product in a cool, ventilated, dry, locked area. Do not allow prolonged storage in areas where temperatures frequently exceed 115° F (46° C). NEVER TRANSFER THIS PRODUCT TO ANOTHER CONTAINER FOR STORAGE.

PESTICIDE DISPOSAL

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING

Non-refillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling if available.

COMPATIBILITY/TANK MIXING

ASSAIL® 70WP Insecticide, when diluted with an equal volume of water, is physically compatible with a wide range of commonly used spray products, but the full range of compatibilities under local conditions is not known. Therefore, it is essential that before using ASSAIL 70WP Insecticide in any tank mixture the compatibility of the mixture be established. Add a small amount of this product to an equal volume of water in a small container and then add the other pesticide or spray product and mix thoroughly. DO NOT USE MIXTURES THAT CURDLE, PRECIPITATE, OR GREASE. FOR BEST RESULTS, SPRAY MIXTURES SHOULD BE USED IMMEDIATELY AFTER MIXING WITH ADEQUATE AGITATION. It is the pesticide user's responsibility to ensure that all products in a tank mix are registered for the intended use. Users must follow the most restrictive directions and precautionary language of the products of the mixture (for example, first aid from one product, spray drift management from another).

Special Instructions for Tank Mixing ASSAIL 70WP Insecticide

When tank mixing ASSAIL 70WP Insecticide with other products, introduce the products into the tank in the following order: (1) water soluble packets (2) wettable powders (such as ASSAIL 70WP Insecticide) (3) water dispersable granules (4) flowable liquids (5) emulsifiable concentrates and (6) adjuvants and/or oils (do not use stickers). Always allow each product to fully disperse before adding the next product.

DIRECTIONS FOR CHEMIGATION

Instructions

For chemigation use only on cranberries and on potatoes after foliage has emerged and only through overhead sprinkler irrigation systems.

Apply this product only through overhead sprinkler irrigation systems including center pivot, lateral move, side (wheel) roll, solid set, or hand move irrigation systems after potato foliage has emerged. Do not apply this product through any other type of irrigation system. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts. A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

The overhead sprinkler chemigation system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor

Foliar

GROUP **4A** INSECTICIDE

VALENT®

BELAY®

50 WDG INSECTICIDE

FOR CONTROL OF LISTED SUCKING AND CHEWING INSECTS INFESTING FRUITING VEGETABLES (INCLUDING CUCURBITS) AND LEAFY VEGETABLES (INCLUDING BRASSICA VEGETABLES).

Ingredients	By Wt.
Active Ingredient	
*Clothianidin	50.0%
Inert Ingredients	50.0%
Total	100.0%

*(*E*)-1-(2-chloro-1,3-thiazol-5-ylmethyl)-3-methyl-2-nitroguanidine

EPA Reg. No. 59639-152
EPA Est. No. 39578-TX-0©, 67545-AZ-0®, 51896-FL-006®
Superscript is first letter in lot number.

KEEP OUT OF REACH OF CHILDREN
CAUTION
SEE BELOW FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS
CAUTION

Causes moderate eye irritation. Harmful if swallowed, absorbed through skin or inhaled. Avoid contact with eyes, skin or clothing. Avoid breathing spray mist.

FIRST AID

If in eyes:	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
If swallowed:	Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

(continued)

FIRST AID (continued)

If on skin or clothing:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
If inhaled:	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact **800-892-0099** for emergency medical treatment information.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some of the materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear: long-sleeved shirt and long pants, shoes and socks and chemical-resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride (PVC).

Follow the manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables available, use detergent and hot water. Keep and wash PPE separately from other laundry.

ENGINEERING CONTROLS

When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

IMPORTANT: When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down.

USER SAFETY RECOMMENDATIONS

Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS

This product is toxic to aquatic invertebrates. Do not apply when weather conditions favor drift from treated areas. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. Do not apply where runoff is likely to occur. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwater or rinsate.

In the State of Florida: The properties of this chemical suggest it may leach into ground water if used in areas where soils are permeable and where the water table is very shallow. Do not apply within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries or commercial fish farm ponds.

This product is toxic to bees exposed to treatment and for more than 5 days following treatment. Do not apply this product to blooming, pollen-shedding, or nectar-producing parts of plants if bees may forage on plants during this time period.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

Do not apply this product in any way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific instructions on this label about personal protective equipment (PPE), notification to workers and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow entry into treated areas during the restricted entry interval (REI) of 12 hours.

(continued)

(continued)

PPE required for early entry into treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is: coveralls, socks and shoes, and chemical-resistant gloves made of any waterproof material.

DISCLAIMER, RISKS OF USING THIS PRODUCT, LIMITED WARRANTY AND LIMITATION OF LIABILITY

IMPORTANT: Read the entire Label including this Disclaimer, Risks of Using this Product, Limited Warranty, and Limitation of Liability before using this product. If the terms are not acceptable THEN DO NOT USE THE PRODUCT; rather, return the unopened product within 15 days of purchase for a refund of the purchase price.

RISKS OF USING THIS PRODUCT

The Buyer and User (referred to collectively herein as "Buyer") of this product should be aware that there are inherent unintended risks associated with the use of this product which are impossible to eliminate. These risks include, but are not limited to, injury to plants and crops to which this product is applied, lack of control of the target pests or weeds, resistance of the target pest or weeds to this product, injury caused by drift, and injury to rotational crops caused by carryover in the soil. Such risks of crop injury, non-performance, resistance or other unintended consequences are unavoidable and may result because of such factors as weather, soil conditions, disease, moisture conditions, irrigation practices, condition of the crop at the time of application, presence of other materials either applied in the tank mix with this product or prior to application of this product, cultural practices or the manner of use or application, (or a combination of such factors) all of which are factors beyond the control of Valent. The Buyer should be aware that these inherent unintended risks may reduce the harvested yield of the crop in all or a portion of the treated acreage, or otherwise affect the crop such that additional care, treatment and expense are required to take the crop to harvest. If the Buyer chooses not to accept these risks, THEN THIS PRODUCT SHOULD NOT BE APPLIED. By applying this product Buyer acknowledges and accepts these inherent unintended risks AND TO THE FULLEST EXTENT ALLOWED BY LAW, AGREES THAT ALL SUCH RISKS ASSOCIATED WITH THE APPLICATION AND USE ARE ASSUMED BY THE BUYER. Valent shall not be responsible for losses or damages (including, but not limited to, loss of yield, increased expenses of farming the crop or such incidental, consequential or special damages that may be claimed) resulting from use of this product in any manner not set forth on the label.

(continued)

Foliar & Soil

GROUP 4A INSECTICIDE

VALENT PROFESSIONAL PRODUCTS

Safari®
20 SG INSECTICIDE

FOR FOLIAR AND SYSTEMIC INSECT CONTROL IN ORNAMENTAL PLANTS AND VEGETABLE TRANSPLANTS IN ENCLOSED STRUCTURES.
FOR GREENHOUSE, NURSERY, INTERIOR PLANTSCAPE, OUTDOOR LANDSCAPE AND FORESTRY USE ONLY.

Active Ingredient:	
Dinotefuran, [N-methyl-N'-nitro-N"-((tetrahydro-3-furanyl)methyl)guanidine]	20%
Other Ingredients..........................	80%
Total	100%

EPA Reg. No. 86203-11-59639 EPA Est. 67545-AZ-01

KEEP OUT OF REACH OF CHILDREN
CAUTION
SEE BELOW FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

FIRST AID

If on skin or clothing: Take off contaminated clothing.
Rinse skin immediately with plenty of water for 15-20 minutes.
Call a poison control center or doctor for further treatment advice.

If swallowed: Call poison control center or doctor immediately for treatment advice.
Do not induce vomiting unless told to do so by the poison control center or doctor.
Have person sip a glass of water if able to swallow.
Do not give anything by mouth to an unconscious person.

(continued)

FIRST AID (continued)

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes.
Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
Call a poison control center or doctor for further treatment advice.

If inhaled: Move person to fresh air.
If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.
Call poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact **800-892-0099** for emergency medical treatment information.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Harmful if swallowed or absorbed through skin. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Causes moderate eye irritation. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Applicators and other handlers must wear:
- Long-sleeved shirt and long pants
- Shoes plus socks

USER SAFETY REQUIREMENTS

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions exist for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:
- Wash hands with soap and water before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in water adjacent to treated areas. Do not dispose equipment washwaters or rinsate into a natural drain or water body.

This product is toxic to honey bees. The persistence of residues and potential residual toxicity of dinotefuran in nectar and pollen suggests the possibility of chronic toxic risk to honey bee larvae and the eventual instability of the hive.

- This product is toxic to bees exposed to residues for more than 38 hours following treatment.
- Do not apply this product to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period, unless the application is made in response to a public health emergency declared by appropriate state or federal authorities.

Dinotefuran and its degradate, MNG, have the properties and characteristics associated with chemicals detected in groundwater. The high water solubility of dinotefuran, and its degradate, MNG, coupled with its very high mobility, and resistance to biodegradation indicates that this compound has a strong potential to leach to the subsurface under certain conditions as a result of label use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

PHYSICAL OR CHEMICAL HAZARDS

Do not use, pour, spill or store near heat or open flame.

SPRAY DRIFT ADVISORY

Do not apply under conditions involving possible drift to food, forage or other plantings that might be damaged or the crop thereof rendered for sale, use or consumption.

PROTECTION OF POLLINATORS

APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

(continued)

PROTECTION OF POLLINATORS (continued)

Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators.

Bees and other insect pollinators will forage on plants when they flower, shed pollen or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications.
- Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

- Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives or off-site to pollinator attractive habitat can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at: http://pesticidestewardship.org/PollinatorProtection/Pages/default.aspx. Pesticide incidents (for example, bee kills) should immediately be reported to the State/Tribal lead agency. For contact information for your State, go to: www.aapco.org. Pesticide incidents should also be reported to the National Pesticide Information Center at: www.npic.orst.edu or directly to EPA at: beekill@epa.gov.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

FOR COMMERCIALLY GROWN ORNAMENTALS NOT UNDER CONTRACT FOR POLLINATION SERVICES BUT ARE ATTRACTIVE TO POLLINATORS

- **Do not apply this product while bees are foraging.**
- **This product is toxic to bees exposed to residue for more than 38 hours following treatment.**
- **Do not apply this product to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period, unless the application is made in response to a public health emergency declared by appropriate state or federal authorities.**

NON-AGRICULTURAL USES

Do not apply Safari® 20 SG Insecticide while bees are foraging. Do not apply *Safari* 20 SG Insecticide to plants that are flowering. Only apply after all flower petals have fallen off.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, greenhouses and handlers of agricultural insecticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

EXCEPTION: If product is drenched or soil-injected, workers may enter the area at any time if there will be no contact with anything that has been treated.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil or water is:

- Coveralls
- Shoes plus socks
- Chemical-resistant gloves (made of any waterproof material)

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not allow others to enter treated areas until sprays have dried.

APPLICATION INFORMATION

- Applications of *Safari* 20 SG Insecticide in residential areas may be made by commercially licensed applicators.

Application to Ornamental Plants (including Forestry):

- *Safari* 20 SG Insecticide can be applied as a foliar spray, a broadcast spray, a soil drench, soil injection and via chemigation for insect control in ornamental plants in greenhouses, nurseries, outdoor landscapes and interior plantscapes.
- *Safari* 20 SG Insecticide is a systemic product and will be taken up by the root system and translocated upward throughout the plant. When applied as a foliar spray, the product offers translaminar and locally systemic control of foliar pests.
- When applied to the soil, *Safari* 20 SG Insecticide will be translocated more quickly in herbaceous plants than in woody shrubs and trees. Speed of insect control will range from as little as one day for small herbaceous plants in containers, to several weeks in large trees growing in the landscape.
- Do not apply more than a total of 2.7 lbs of product (0.54 lb active ingredient) per acre per year for all application types.
- **Do not apply this product, by any application method, to linden, basswood or other *Tilia* species.**

Application to Vegetable Transplants:

- *Safari* 20 SG Insecticide can be applied as a foliar spray or a broadcast spray for insect control in vegetable transplants.
- Do not apply more than 1.34 lbs (0.268 lbs ai) per acre of nursery per year.

MIXING INSTRUCTIONS:

Safari 20 SG Insecticide Alone: Add half of the required amount of water to the mix tank. With the agitator running, add the desired amount of *Safari* 20 SG Insecticide to the tank. Continue agitation while adding the remainder of the water. Begin application of the solution after *Safari* 20 SG Insecticide has completely dispersed into the mix water. Maintain agitation until all of the mixture has been applied.

Safari 20 SG Insecticide + Tank Mixtures: Add half of the required amount of water to the mix tank. Start the agitator running before adding any tank mix partners. In general, add tank mix partners in this order: products packaged in water-soluble packaging, wettable powders, wettable granules (dry flowables), liquid flowables, liquids, emulsifiable concentrates, and surfactants/adjuvants. Always allow each tank

ORNAMENTAL PLANTS AND FORESTS – FOLIAR OR BROADCAST SPRAY APPLICATION – OUTDOOR

For foliar insect control on ornamental plants in nurseries, outdoor landscapes (commercial, industrial, recreational and residential), tree plantations, reforestation nurseries and forests.

Crops	Pests	Product Rate	Remarks
Ornamental plants including: Shrubs Bedding Plants Flowering Plants Foliage Plants Ground Covers Evergreens Ornamental Trees Non-Bearing Fruit Trees Non-Bearing Nut Trees Non-Bearing Vines Christmas Trees Trees in Plantations including: Conifers Deciduous trees Reforestation Nurseries Forests and Wooded Areas: National, Private and State	Adelgids including: Hemlock Woolly, Balsam Woolly Aphids (suppression) including: Balsam, Crepe Myrtle, Green Peach Melon Japanese Beetles (adults) Lacebugs including: Azalea, Cotoneaster, Hawthorne Rhododendron Leaf Beetles, Viburnum Leafhoppers, including: Glassy-Winged Sharpshooter, Potato Leafminers including: Serpentine Mealybugs including: Citrus, Long-Tailed, Madeira, Obscure, Phormium, Pink Hibiscus Psyllids including: Asian Citrus Root Weevils (adults) including: Black Vine, Diaprepes Sawflies (larvae) Scale (Armored and Soft) including: Cryptomeria, Cycad Aulacaspis, Elongate Hemlock, Euonymus, Florida Red, Florida Wax, Tea Thrips including: Chilli, Gynaikothrips uzeli, Western Flower (suppression) Whiteflies including: Fig (Ficus), Giant, Greenhouse, Silverleaf / Sweetpotato (B and Q Biotypes)	**Foliar Spray** 1/4 to 1/2 lb per 100 gallons (4 to 8 oz per 100 gallons) (0.05 to 0.1 lbs ai per 100 gallons) 8-16 oz per Acre (0.1 to 0.2 lbs ai/A) 0.2-0.4 oz per 1,000 sq ft For treatment of small areas: 1/2-1.0 tsp per gallon	Make first application just before pest populations reach an economic threshold. If necessary, make a second application after 14-21 days. Tank mixing with a surfactant may improve control of pests such as whitefly, mealybug and scale. Confirm plant safety of tank mix in small area before using on a commercial scale. 100 gals of spray mix will treat 20,000 sq ft of area when using a typical high volume sprayer. If using a low volume sprayer, adjust concentration to apply the same amount of product per unit area.

One (1) level teaspoon contains 2.4 grams and 1 cup (8 fl oz) contains 4.0 oz by weight of *Safari* 20 SG Insecticide.

Make first application just before pest populations reach an economic threshold. If necessary, make a second application after 14-21 days.

Restrictions:

Not for use on house plants grown inside private residences.

Do not apply more than 2.7 lbs (0.54 lbs ai) per acre of nursery, landscape or forest per year.

To delay the development of resistance: Do not apply *Safari* 20 SG Insecticide or other Group 4A insecticides to consecutive generations of the same insect species without switching to a different mode of action. Do not make more than two sprays of *Safari* 20 SG Insecticide or other Group 4A insecticides to a single crop. Refer to "Resistance Management" section of label for further guidelines.

Foliar & Soil

Alias® 4F

GROUP 4A INSECTICIDE

Flowable Insecticide

For use on a variety of listed agricultural and commercial crops.

ACTIVE INGREDIENT:	% BY WT.
Imidacloprid; 1-[(6-Chloro-3-pyridinyl)methyl]-*N*-nitro-2-imidazolidinimine	40.6%
OTHER INGREDIENTS:	59.4%
TOTAL	100.0%

Contains 4 lbs. of active ingredient per gallon

EPA Reg. No. 66222-156

EPA Est. No. 37429-GA-001[BT]; 37429-GA-002[BO]

Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN

CAUTION

For First Aid, Precautionary Statements, and Directions for Use, see inside of this booklet.

How can we help?
1-866-406-6262

INSECTICIDE

Net Contents
1 gallon

ADAMA
ESSENTIALS

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops/plants or weeds. Do not apply this product or allow it to drift to blooming crops/plants or weeds if bees are foraging. This product is toxic to wildlife and highly toxic to aquatic invertebrates.

This chemical demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

PROTECTION OF POLLINATORS

APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

Look for the bee hazard icon  in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators.

Bees and other insect pollinators will forage on plants when they flower, shed pollen, or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- o Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications
- o Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

- o Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- o Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives or off-site to pollinator attractive habitat can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at: http://pesticidestewardship.org/PollinatorProtection/Pages/default.aspx.

Pesticide incidents (for example, bee kills) should immediately be reported to the state/tribal lead agency. For contact information for your state, go to: www.aapco.org/officials.html. Pesticide incidents should also be reported to the National Pesticide Information Center at: www.npic.orst.edu or directly to EPA at: beekill@epa.gov

OBSERVE THE FOLLOWING PRECAUTIONS WHEN MIXING AND APPLYING IN THE VICINITY OF AQUATIC AREAS SUCH AS LAKES, RESERVOIRS, RIVERS, PERMANENT STREAMS, MARSHES OR NATURAL PONDS, ESTUARIES, AND COMMERCIAL FISH FARM PONDS.

SPRAY DRIFT MANAGEMENT

The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator is responsible for considering all of these factors when making application decisions. Avoiding spray drift is the responsibility of the applicator.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

See individual crops for specific pollinator protection application restrictions. If none exist under the specific crop, for foliar applications, follow these application directions for crops that are contracted to have pollinator services or for food/feed crops and commercially grown ornamentals that are attractive to pollinators:

FOR CROPS UNDER CONTRACTED POLLINATION SERVICES

Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless the following condition has been met:

If an application must be made when managed bees are at the treatment site, the beekeeper providing the pollination services must be notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

FOR FOOD/FEED CROPS AND COMMERCIALLY GROWN ORNAMENTALS NOT UNDER CONTRACT FOR POLLINATION SERVICES BUT ARE ATTRACTIVE TO POLLINATORS

Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless one of the following conditions is met:

- The application is made to the target site after sunset
- The application is made to the target site when temperatures are below 55°F
- The application is made in accordance with a government-initiated public health response
- The application is made in accordance with an active state-administered apiary registry program where beekeepers are notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying
- The application is made due to an imminent threat of significant crop loss, and a documented determination consistent with an IPM plan or predetermined economic threshold is met. Every effort should be made to notify beekeepers no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the Agency responsible for pesticide regulation.

Foliar

Sale, use and distribution of this product in Nassau and Suffolk counties in the state of New York is prohibited.

PULL HERE TO OPEN ►

GROUP 4A INSECTICIDE

Actara®

syngenta®

Insecticide

For control of certain insect pests infesting listed crops

Active Ingredient:	
Thiamethoxam[1]	25.0%
Other Ingredients:	75.0%
Total:	100.0%

[1]CAS No. 153719-23-4

Actara is a water-dispersible granule.

KEEP OUT OF REACH OF CHILDREN.

CAUTION

See additional precautionary statements and directions for use in booklet.

EPA Reg. No. 100-938 EPA Est. 67545-AZ-1

Product of India
Formulated in the USA

SCP 938A-L2M 1213
4033546

7 pounds,
8 ounces (120 oz)
Net Weight

TM

PRECAUTIONARY STATEMENTS *(continued)*

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Environmental Hazards

This pesticide is toxic to wildlife and highly toxic to aquatic invertebrates.

This pesticide is highly toxic to bees exposed to direct treatment on blooming crops/plants or weeds. Do not apply this product or allow it to drift to blooming crops/plants or weeds while bees are foraging in/or adjacent to the treatment area.

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift or runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when cleaning equipment or disposing of equipment wash waters.

- **Surface Water Advisory**

  This product may impact surface water quality due to spray drift and runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having high potential for reaching surface water via runoff for several months after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of thiamethoxam water from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall is forecast to occur within 48 hours. (See manual at the following Internet address:

  http://www.wsi.nrcs.usda.gov/products/W2Q/pest/core4.html).

- **Ground Water Advisory**

  Thiamethoxam has properties and characteristics associated with chemicals detected in ground water. This chemical may leach into the ground water if used in areas where soils are permeable, particularly where the water table is shallow.

- **Spray Drift Advisory**

  Do not allow this product to drift.

Physical or Chemical Hazards

Do not use, pour, spill, or store near heat or open flame.

PROTECTION OF POLLINATORS

APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

Look for the bee hazard icon  in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators

Bees and other insect pollinators will forage on plants when they flower, shed pollen, or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- o Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications
- o Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

- o Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- o Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives or off-site to pollinator attractive habitat can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at: http://pesticidestewardship.org/PollinatorProtection/Pages/default.aspx.

Pesticide incidents (for example, bee kills) should immediately be reported to the state/tribal lead agency. For contact information for your state, go to: www.aapco.org/officials.html. Pesticide incidents should also be reported to the National Pesticide Information Center at: www.npic.orst.edu or directly to EPA at: beekill@epa.gov

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of SYNGENTA CROP PROTECTION, LLC or Seller. To the extent permitted by applicable law, Buyer and User agree to hold SYNGENTA and Seller harmless for any claims relating to such factors.

SYNGENTA warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. To the extent permitted by applicable law: (1) this warranty does not extend to the use of the product contrary to label instructions, or under conditions not reasonably foreseeable to or beyond the control of Seller or SYNGENTA, and (2) Buyer and User assume the risk of any such use. TO THE EXTENT PERMITTED BY APPLICABLE LAW, SYNGENTA MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS WARRANTED BY THIS LABEL.

To the extent permitted by applicable law, in no event shall SYNGENTA be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF SYNGENTA AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF SYNGENTA OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

SYNGENTA and Seller offer this product, and Buyer and User accept it, subject to the foregoing Conditions of Sale and Limitation of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of SYNGENTA.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

See individual crops for specific pollinator protection application restrictions. If none exist under the specific crop, for foliar applications, follow these application directions for crops that are contracted to have pollinator services or for food/feed crops & commercially grown ornamentals that are attractive to pollinators.

FOR CROPS UNDER CONTRACTED POLLINATION SERVICES

Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless the following condition has been met:

If an application must be made when managed bees are at the treatment site, the beekeeper providing the pollination services must be notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

FOR FOOD/FEED CROPS AND COMMERCIALLY GROWN ORNAMENTALS NOT UNDER CONTRACT FOR POLLINATION SERVICES BUT ARE ATTRACTIVE TO POLLINATORS

Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless one of the following conditions is met:

- **The application is made to the target site after sunset**
- **The application is made to the target site when temperatures are below 55°F**
- **The application is made in accordance with a government-initiated public health response**
- **The application is made in accordance with an active state-administered apiary registry program where beekeepers are notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying**
- **The application is made due to an imminent threat of significant crop loss, and a documented determination consistent with an IPM plan or predetermined economic threshold is met. Every effort should be made to notify beekeepers no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.**

If using Actara in a tank mixture, observe all directions for use, crop/sites, use rates, dilution ratios, precautions, and limitations, which appear on the tank mix product label. Do not exceed any label dosage rate, and follow the most restrictive label precautions and limitations. Do not mix this product with any product which prohibits such mixing. Tank mixtures or other applications of products referenced on this label are permitted only in those states in which the referenced products are labeled.

Compatibility

Actara is compatible with most commonly used pesticides, crop oils, adjuvants, and nutritional sprays. However, since it is not possible to test all possible mixtures, the user should pre-test to assure the physical compatibility and lack of phytotoxic effect of any proposed mixtures with Actara. To determine the physical compatibility of Actara with other products, use a jar test, as described below.

Using a quart jar, add the proportionate amounts of the products to 1 qt of water. Add wettable powders and water-dispersible granular products first, then liquid flowables, and emulsifiable concentrates last. After thoroughly mixing, let stand for at least 5 minutes. If the combination remains mixed or can be remixed readily, it is physically compatible. Once compatibility has been proven, use the same procedure for adding required ingredients to the spray tank.

The crop safety of all potential tank mixes on all crops has not been tested. Confirm the safety to the target crop before applying any tank mixture not specified on this label.

CROP USE DIRECTIONS

Pollinator Precautions

- Actara is highly toxic to bees exposed to direct treatment on blooming crops/plants or weeds.
  - For **apples,** do not apply Actara after pre-bloom (early pink growth stage) or before post bloom (petal fall growth stage).
  - For **citrus,** do not apply during pre-bloom or during bloom when bees are actively foraging.
  - For **pears,** do not apply Actara after pre-bloom (green cluster stage) or before post bloom (petal fall growth stage).
  - For **stone fruit,** do not apply Actara between the pre-bloom (swollen bud) and post bloom (petal fall) growth stages.
- Do not apply Actara or allow it to drift to blooming crops/plants or weeds if bees are **foraging in/or adjacent to the treatment area.** This is especially critical if there are adjacent orchards that are blooming. (Refer to **Spray Drift Precautions** for additional information).
- **After an Actara application, wait at least 5 days before placing beehives in the treated field.**
- If bees are foraging in the ground cover and it contains any blooming plants or weeds, always remove flowers before making an application. This may be accomplished by mowing, disking, mulching, flailing, or applying a labeled herbicide.
- Consult with your local cooperative extension service or state agency responsible for regulating pesticide use for additional pollinator safety practices.

Crop	Pest	Rate Per Acre Per Application
Barley	Aphids	4.0 oz/A

Use Restrictions:

- **Maximum Actara Allowed per Growing Season:** Do not exceed a total of 8.0 oz/Acre (0.125 lb ai/A) of Actara or 0.125 lb ai of thiamethoxam containing products per acre per growing season.
- **Application Timing:** Apply before pests reach damaging levels. Scout fields and treat again if populations rebuild to potentially damaging levels.
- **Pre-Harvest Interval (PHI):** 21 days

Seed treatment

PULL HERE TO OPEN

GROUP 4A INSECTICIDE

Cruiser® 70 WS
Insecticide

syngenta®

A seed treatment product for control of listed insects on Carrots, Leafy Vegetables, Dry Bulb Onions and *Brassica* (Cole) Leafy Vegetables.

Active Ingredient:	
Thiamethoxam[1]	70.0%
Other Ingredients:	30.0%
Total:	100.0%

[1]CAS No. 153719-23-4

Cruiser 70 WS contains 0.7 pounds of thiamethoxam per pound of formulated product.

KEEP OUT OF REACH OF CHILDREN.

CAUTION

See additional precautionary statements and directions for use in booklet.

EPA Reg. No. 100-1294 EPA Est. 67545-AZ-1

SCP 1294A-L1C 0113
4021286

1 pound
Net Weight

TM

PRECAUTIONARY STATEMENTS *(continued)*

Multiple Task Workers must wear:

(Multiple task workers perform multiple tasks in one day such as mixing, product application, bagging/filling seed containers, bag sewing, and clean-up)

- Chemical-resistant coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material - Category A (e.g., natural rubber ≥14 mils)
- Shoes plus socks
- Respirator protection (i.e., single use dust mask, quarter or half mask respirator)

All other Workers and Handlers must wear:

(Workers involved in bagging treated seed or sewing seed bags)

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material - Category A (e.g., natural rubber ≥14 mils)
- Shoes plus socks

User Safety Requirements

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. DO NOT reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions exist for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Control Statements

This product must be packaged in water soluble bags. Handlers handling this product while it is enclosed in intact water-soluble packets may elect to not wear the respirator.

IMPORTANT: When the respirator is not worn because intact water-soluble packets are in use, handlers must still be provided and have immediately available a respirator for use in an emergency (such as the water-soluble bag breaking prior to mixing).

User Safety Recommendations

Users should:

- Wash thoroughly with soap and water after handling.
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards

This pesticide is toxic to wildlife and highly toxic to aquatic invertebrates. Thiamethoxam is highly toxic to bees exposed to direct treatment, and effects may be possible as a result of exposure to translocated residues in blooming crops. Do not contaminate water when disposing of equipment washwater.

Seed trreatment

BAYER

Gaucho® 600

FLOWABLE

Net Contents:

2.5 Gallons

Contains 5 lbs active per gallon (600 grams per liter) @ 20°C

ACTIVE INGREDIENT:
Imidacloprid: 1-[(6-Chloro-3-pyridinyl) methyl]-N-nitro-2-imidazolidinimine **48.7%**
OTHER INGREDIENTS: **51.3%**
TOTAL: 100.0%

EPA Reg. No. 264-968

KEEP OUT OF REACH OF CHILDREN
CAUTION

For **MEDICAL** And **TRANSPORTATION** Emergencies **ONLY**
Call 24 Hours A Day 1-800-334-7577
For **PRODUCT USE** Information Call 1-866-99BAYER (1-866-992-2937)

FOR ADDITIONAL PRECAUTIONARY STATEMENTS: See Inside Booklet

161116B 03/17

US61379949B

Produced for:
Bayer CropScience LP
P.O. Box 12014, 2 T.W. Alexander Drive
Research Triangle Park, North Carolina 27709

FIRST AID

IF SWALLOWED:	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
IF INHALED:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.

In case of emergency call toll free the Bayer CropScience Emergency Response Telephone No. 1-800-334-7577.

Have a product container or label with you when calling a poison control center or doctor, or going for treatment.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if swallowed, absorbed through skin or inhaled. Avoid breathing vapor or spray mist. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category C on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear: Long-sleeved shirt and long pants, socks and shoes and chemical-resistant gloves (such as nitrile, butyl, neoprene, barrier laminate, polyvinyl chloride or Viton). Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change clothing.

ENVIRONMENTAL HAZARDS

This pesticide is highly toxic to bees, birds and aquatic invertebrates. For terrestrial uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Cover or incorporate spilled treated seeds.

Ensure that planting equipment is functioning properly in accordance with manufacturing specifications to minimize seed coat abrasion during planting to reduce dust which can drift to blooming crops or weeds.

Neonicotinoid Uses in Oregon

ACETAMIPRID

- Tree Nuts
  - Aphids
  - Leaf hoppers
  - **Walnut husk Fly (critical use)**
  - Filbert worm
- Multiple vegetables
  - Japanese Beetle
  - Leafhopper
  - **Aphids (critical use)**
  - **Cucumber Beetles (critical Use)**
  - Whitefly
  - Thrips
  - Squash Bug
  - Flea Beetle
- Fruit (strawberry, blueberry, Caneberry, grapes, kiwi, pome fruit, stone fruit, ect.)
  - Aphids
  - Leafhoppers
  - Whiteflies
  - **Blueberry gall midge (critical use)**
  - Fruitworm
  - Mealybugs
  - Phyloxera
  - **Grape cane girdler (critical use)**
  - Grape berry moth
  - **Cherry fruit Fly (critical use)**
  - **Oriental Fruit moth (critical use)**
  - San Jose Scale
  - **Spittle bug (critical use)**
- Clover
  - **Aphids (critical use)**
- Nursery
  - Aphids
  - Thrips
  - **Psyllids (critical use)**
  - Leaf miners
  - Leafhoppers
  - Fungus gnat larvae
  - Leaf eating beetles
  - **Adelgids (critical use)**
  - Scale

CLOTHIANIDIN (seed treatment, foliar, soil)

- Vegetables
    - Aphids
    - **Flea Beetles (critical use)**
    - Leafhoppers
    - Stinkbugs
    - Thrips
    - **Cucumber beetles (critical use)**
    - Lygus
    - Colorado Potato Beetles
    - **Carrot Rust Fly (critical use)**
    - **Onion maggot (Critical use)**
    - **Seedcorn Maggot (critical use)**
    - Thrips
- Ornamental, Turfgrass, Landscape, Sod Farms, Non-bearing fruit and nut trees
    - Adelgids
    - Leaf Beetles
    - Leafhoppers
    - Leaf miners
    - **Mealybugs (critical use)**
    - **Psyllids (critical use)**
    - **Root Weevils (critical use)**
    - Thrips
    - Whiteflies
    - **White Grubs (critical use)**
    - Bill bugs
    - Spittlebugs
    - Chinch bugs
    - Crane fly
    - Cutworms
    - Sod Webworms
- Apple, Grapes and Pear
    - Aphids
    - Leafhoppers
    - **Apple maggot (critical use)**
    - **Oriental fruit moth (critical use)**
    - **Psylla (critical use)**
    - Leaf miners
    - **Mealybug (critical use)**

DINOTEFURAN

- Vegetables
    - Cucumber Beetle
    - Leafhoppers
    - Squash bug
    - Stink Bug
    - Thrips
    - Whiteflies
    - Flea beetles
    - Colorado Potato Beetle
    - Psyllids
    - Aphids
- Grape, Kiwi, Strawberry, Blueberry
    - **Glassy-Wing Sharpshooter (critical use)**
    - **Mealybug (critical use)**
    - Leafhoppers
- Greenhouse, Ornamentals, vegetable transplants, Landscape, Forestry
    - Aphids
    - **Leaf miners (critical use)**
    - **Mealybugs (critical use)**
    - Thirips
    - Whiteflies
    - **Adelgids (critical use)**
    - Leaf Beetles
    - Psyllids
    - Root Weevils
    - **Scale (critical Use)**
    - Fungus gnats
    - **Flatheaded Borers (Critical use)**
    - **Gypsy Moth (critical use)**
    - **Glassy-Wing Sharpshooter (critical use)**
    - Roundheaded Borers
    - Spittlebugs
    - Tent Caterpillar
    - Walnut twig beetle
    - White Grubs
    - **White Pine Weevil (critical Use)**

IMIDACLOPRID (soil, foliar and seed treatments

- Vegetables
  - **Aphids (critical use)**
  - Thrips
  - Stink bugs
  - **Flea Beetles (critical use)**
  - Colorado potato beetle
  - **Psyllid (critical use)**
  - Leafhopper
  - **Cucumber beetles (critical use)**
  - Whiteflies
- Hazelnuts
  - Aphids
- Fruit
  - Aphids
  - Leafhoppers
  - Whiteflies
  - Thrips
  - Spittlebugs
  - Japanese beetle
  - **Rednecked caneborer (critical use)**
  - Root grubs
  - European fruit lecanium
  - Sharpshooters
  - **Mealybugs (critical use)**
  - Leaf miners
  - **Apple maggot (critical use)**
  - Phylloxera
- Seed treatment
  - **Corn root worm (critical use)**
  - Flea beetles
  - Chinch bug
  - Thrips
  - **Seed corn maggot (critical use)**
  - **Wireworm (critical use)**
- Christmas trees, pulp trees, Ornamentals, Greenhouses
  - Aphids
  - **Adelgids (critical use)**
  - Leaf Beetles
  - Leaf hoppers
  - **Glassy-winged sharpshooter (critical use)**
  - Leaf miners

- Christmas trees, pulp trees, Ornamentals, greenhouses continued
  - **Mealybugs (critical use)**
  - Thrips
  - Whiteflies
  - **Black vine weevil (critical use)**
  - Flatheaded borers
  - **Soft scale (critical use)**
  - White grub larvae
  - **Root weevils (critical use)**
  - Psyllid
  - Mealybugs

THIAMETHOXAM (Seed treatment, foliar and soil)

- Vegetables
  - Aphids
  - Beetles
  - **Seed and root maggots (critical use)**
  - Flea beetles
  - Whiteflies
  - **Wireworm (critical use)**
  - Leaf miners
  - Leaf hoppers
  - Colorado Potato Beetle
  - Cucumber Beetles
  -
- Grains
  - **Aphids (critical use)**
- Fruit
  - Aphids
  - **Cranberry Weevil (critical use**)
  - Leafhoppers
  - **Stinkbugs (critical use)**
  - Whiteflies
  - Mealybug
  - **Sharpshooters (critical use)**
  - Japanese Beetles
  - **Psylla (critical use)**
  - **Cherry Fruit Fly (critical use)**
  - Grub complex

WILBUR-ELLIS
AGRIBUSINESS

My name is Michelle Armstrong-Zielinski I strongly oppose HB3058, I have worked as an agronomist for 15 years, sit as the current Vice-Chairman of the Oregon Hazelnut Commission, a licensed pesticide consultant, my husband and I farm 200-acre and I am a 4th generation farmer. Growing up on a small family dairy farm I learned early on the value of teamwork, hard work, the ability to adapt and the benefits of having the right tools to do the job.

Fighting pests is a multi-faceted process called Integrated Pest Management (IPM), having many tools available to all growers is key for farmers to keep their crops and their families lively hood going. A pest is a natural disaster with the ability to wipe out an entire crop and potentially that years profit in a matter of days, limiting the ability for them to care for their families, their employees and their employee's families. If they do not have the right options, it would be no different then fighting a grease fire with water; some things just will not work.

Farmers work with agronomist to create an IPM program to avoid overuse of any given product and prevent resistance by the pest as well as making sure what they are using is safe for the area it will be applied to. These programs include beneficial bugs, cultural practices, and all products available both organic and conventional. We read the labels and often use a recommendation program to be sure all warnings are given to the farmer to keep not only the employees and bees safe but the environment around them as well.

As you will see on the labels provided to you, on products that have any environmental warning there is a special section dedicated to warning the farmer and the agronomist of the dangers. It is the law to read the label and we take the responsibility to care for the land and pollinators to heart. When used properly I have not seen neonicotinoids harm to bees in the all the years I have been in the industry. When we have products that have extreme toxicity to bees manufactures have provide another special section on the label known as the **"Bee Box".** This takes up a large section on a label, often multiple pages, along with a reminder to the user at each crop section that it needs to be looked at before applications are made. Farmers adapt to new methods and tools when they are available, which can take 10 years or more to move new chemistries through the process. They are rapidly implementing cover cropping as a standard part of their operations which helps keeps the soils and products applied in the field area in which the application took place.

I have provided to you a list of use for Neonicotinoids and Chlorpyrifos in the state of Oregon along with which ones are considered critical uses of those products. Those have been deemed critical uses due to the lack of multiple tools to control those pests and the loss of any products to do so could mean crop loss and resistance to other available options. Currently we are seeing a resistance to the organic insecticide Spinosad with Spotted Wing Drosophila (SWD), a pest that lays its eggs in ripening fruit and larvae than feeds on the fruit as it matures, this has occurred due to the fact that we have very limited effective chemistries to SWD in organic production.

Over the years Oregon has chosen to simply regulate alcohol and marijuana that cause neurological damage rather than banning them, in the case of marijuana even legalizing it for wide spread use. Why does legislation look to ban some things but not others?

Thank you for your time and I would be happy to answer any questions.

Michelle Armstrong-Zielinski

Raszka Shelley

From: Mike Schaer <user@votervoice.net>
Sent: Thursday, March 21, 2019 8:26 AM
To: Exhibits HAGLU
Subject: HB 3058/SB853

Dear Chair Clem,

Please oppose above bills.This legislation would destroy farming as we know it.

Sincerely,

Mike Schaer
151 Fink St
Coos Bay, OR 97420
m.schaer@yahoo.com

From:	Nathalie Mary
To:	Exhibits HAGLU
Subject:	HB 3058
Date:	Monday, March 25, 2019 11:27:46 AM

I am in support of HB 3058.
I got VERY sick in January 2015 when I was offered Harry and David pears as a gift for the holidays. I ate 2 of the 4 pears, with the skin on, as I had been told they were organically grown. Turns out they were laced with pesticides, 7 of them! my whole body was covered with huge painful welts. I ended up at the doctor's office 5 times and the emergency room 3 times in the course of one week! No one really knew what to do either to help me. It took over 6 weeks for the swelling, welts, fluid to go away. I was diagnosed with Acute Urticaria That is not a diagnosis I care to be receiving ever again. The pain was agony. Harry & David's response was that they are proud that almost half of their orchards are organic. Really? What's the over the other half? Yes, training and certification are much needed!
Nathalie Mary
503-550-2492

OREGON BUSINESS & INDUSTRY OBI

1149 Court Street NE
Salem, OR 97301

T: 503.588.0050
F: 503.588.0052

Statewide: 800.452.7862
oregonbusinessindustry.com

March 26, 2019

To: Chair and Members of the Committee on Environment and Natural Resources
From: Paloma Sparks, OBI
RE: OBI Testimony in Opposition to HB 3058

Chair and Members of the Committee:

Thank you for the opportunity to submit written testimony on this important issue for Oregon Business & Industry members. OBI is Oregon's most comprehensive business association representing approximately 1,600 businesses that employ nearly 330,000 people. We represent multiple sectors and serve as the state's Retail and Manufacturing Councils.

OBI opposes HB 3058, which would re-classify neonicotinoid pesticides as restricted use pesticides, and also ban the use of pesticides containing chlorpyrifos. These pesticide products are heavily regulated by the U.S. Environmental Protection Agency (EPA) under the Federal Insecticide Fungicide and Rodenticide Act and additionally reviewed through the Oregon Department of Agriculture's registration process. Banning the use of chlorpyrifos and classifying neonicotinoid products as restricted use pesticides is not supported by science and would result in harm to the production of Oregon agricultural products.

These pesticides have been safely used by Oregon farmers who also rely on native pollinators in the production of many of their crops. We are concerned that the designation of neonicotinoids as restricted use would require farmers to obtain pesticide applicator licenses when the products have not been shown to cause high risk to human health or the environment. The sudden change to a restricted use designation would necessitate significant changes to the certified applicator license program, which would be onerous to ODA. Neonicontinoids are currently under registration review by the EPA, a scientifically-rigorous, multi-year process, which examines the risks and benefits of a pesticide. The updated pollinator risk assessment and proposed interim decision will be published this spring as part of this process

Chlorpyrifos is an important part of pest management programs. The use of chlorpyrifos varies from year to year and the decision to utilize this pesticide is made on a site-specific basis. Some crops have few pest control alternatives, which can result in severely diminished yields and dire economic consequences for farmers. In addition to diminished or disastrous impacts on crops, a chlorpyrifos ban would inhibit international trade of ag commodities, since the pesticide is widely used internationally and alternative pesticides may not be cleared in foreign markets. We would note that all neonicotinoids are also currently in EPA's registration review process and must be completed by a statutory deadline of October 1, 2022.

Neonicotinoids and chlorpyrifos are important components of pest control strategies. OBI urges the Committee to oppose SB 853 and allow the agencies charged with regulating pesticides and protecting human health and the environment, to examine the data and make the appropriate determination.

Contact: Paloma Sparks, OBI, palomasparks@oregonbusinessindustry.com

March 24, 2019

To: Chair Brian Clem, Oregon House Agriculture & Land Use Committee
Regarding: HB 3058: Prohibits sale, purchase or use of pesticide chlorpyrifos. Requires State Department of Agriculture to place pesticide products containing neonicotinoid on list of restricted-use pesticides.

The American Seed Trade Association (ASTA) is writing this letter to oppose HB 3058, which is currently pending before the Oregon legislature. This bill seeks to prohibit the use of chlorpyrifos in the State; including its use as a seed treatment.

Founded in 1883, ASTA is one of the oldest trade organizations in the United States. Its membership consists of almost 800 companies involved in seed production and distribution, plant breeding, and related industries. ASTA is a diverse organization. It represents all types of seed companies and technologies – seed from alfalfa to zucchini, technologies from organic to biotechnology, and companies from "mom and pop" to multinationals. It works on behalf of all of its members at the state, national, and international levels. In other words, ASTA represents every seed company that would be affected by the proposed legislation, and it works in cooperation with the rest of agribusiness and consumers, whom the proposed legislation would also benefit.

This bill raises several legal concerns. Depending on the circumstances in which it is applied, the language in the bill may be preempted by federal law. In essence, the bill would impose an additional burden on the users of the federally regulated pesticide and seed treatments. Federal law confers the treated article exemption for seed treatments, as it does with many other products; such as dog collars, lumber, telephone poles, to name only a few.

The treated article exemption is a longstanding policy of EPA. An article is exempt from regulation under FIFRA by virtue of the treated article exemption if the following three conditions are satisfied: (i) the article contains or is treated with a pesticide; (ii) the pesticide is intended to protect the article itself; and (iii) the pesticide is registered for this use. Treated seeds meet all of these requirements.

This bill would impact the seed industry in Oregon and unduly impact interstate commerce. The bill is anticompetitive and potentially discriminatory among different agricultural sectors. The cost of the seed for farmers will increase and/or the availability of seed will decrease. Both of these effects would penalize unnecessarily the many Oregon farmers producing high quality crops from such seed. It would also penalize all others in the seed supply chain, including dealers, as well as small and large companies. It also would reduce the size, offering and competitiveness of the Oregon seed industry compared to other states. To the extent that increases in input and production costs are passed through the food chain, the bill would penalize Oregon consumers, as well.

In summary, the use of seeds improved through modern technologies, such as seed treatments, continues to grow around the world as a result of their economic, environmental, and human health benefits. Farmers' use of these seeds in Oregon is no exception to this pattern of growth. In our view, HB 3058 as it is now drafted raises several serious legal and practical concerns. Of significance, it would add unnecessarily to the cost of doing business in Oregon and penalize Oregon farmers and consumers. Affecting seed companies large and small including farmer dealers, HB 3058 would also reduce the size, offerings, and competitiveness of the seed industry in Oregon compared to other states.

Please do not hesitate to contact us if you have any questions. Thank you for your consideration.

Sincerely,

Pat T. Miller
Director, State Affairs

From:	Caren Weinhouse
To:	Exhibits HAGLU
Cc:	Peter Spencer; Mitchell Turker
Subject:	HB3058 HB2980 - Written testimony
Date:	Tuesday, March 26, 2019 6:17:35 AM

As scientists that study the toxicity of chemical compounds, including neurotoxic compounds, we write to highlight the evidence for chlorpyrifos toxicity and to encourage the committee to support legislation banning the use of chlorpyrifos in the state of Oregon.

As reviewed comprehensively by the Environmental Protection Agency in 2015 and 2016 [1-3], the animal evidence for neurotoxicity of chlorpyrifos at very low doses is conclusive, and the human observational evidence is highly compelling. We highlight seminal papers in the animal [4] and human population [5, 6] literature here. In particular, this subject was addressed in a concrete fashion in an updated 2018 academic review of the scientific literature [7] concluded that "compelling evidence indicates that prenatal exposure at low levels is putting children at risk for cognitive and behavioral deficits and for neurodevelopmental disorders". Phase-out of OP pesticides particularly chlorpyrifos, was recommended [8]. As a result, the EPA proposed a national ban on chlorpyrifos, which implementation is pending a court decision.

We concur with the EPA's recommendation, based on our scientific knowledge, and, in one case, on professional publication on the topic. Notably, one of the undersigned (P.S.) participated in a comprehensive biomedical review [9] of the toxicology of chlorpyrifos.

1. EPA 2015. Proposal to revoke all food residue tolerances for chlorpyrifos (October). EPA-HQ-OPP-2015-0653. www.epa.gov/ingredients-used-pesticide-products/proposal-revoke-chlorpyrifos-food-residue-tolerances

2. EPA 2016. Chlorpyrifos: Revised human health risk assessment for registration review (November). EPA-HQOPP-2015-0653-0402. https://www.epa.gov/pesticides/updated-human-health-risk-analyses-chlorpyrifos

3. EPA SAP 2016. FIFRA Scientific Advisory Panel. Chlorpyrifos: Analysis of Biomonitoring Data (April). EPA-HQ-OPP2016-0062. https://www.epa.gov/sap/meeting-materials-april-19-21-2016-scientific-advisory-panel

4. Aldridge JE, Levin ED, Seidler FJ, Slotkin TA. Developmental exposure of rats to chlorpyrifos leads to behavioral alterations in adulthood, involving serotonergic mechanisms and resembling animal models of depression. Environ Health Perspect. 2005 May;113(5):527-31.

5. Bouchard MF, Chevrier J, Harley KG, Kogut K, Vedar M, Calderon N, Trujillo C, Johnson C, Bradman A, Barr DB, Eskenazi B., Prenatal exposure to organophosphate pesticides and IQ in 7-year-old children. Environ Health Perspect, 2011 119(8): 1189-95.

6. Engel SM, Bradman A, Wolff MS, Rauh VA, Harley KG, Yang JH, Hoepner LA, Barr DB, Yolton K, Vedar MG, Xu Y, Hornung RW, Wetmur JG, Chen J, Holland NT, Perera FP, Whyatt RM, Lanphear BP, Eskenazi B.., Prenatal organophosphorus pesticide exposure and child neurodevelopment at 24 months: an analysis of four birth cohorts. Environ Health

Perspect, 2015 Sep 29.

7. Hertz-Picciotto I, Sass JB, Engel S, Bennett DH, Bradman A, Eskenazi B, Lanphear B, Whyatt R. Organophosphate exposures during pregnancy and child neurodevelopment: Recommendations for essential policy reforms.PLoS Med. 2018 Oct 24;15(10):e1002671. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6200179/

8. Shelton JF, Geraghty EM, Tancredi DJ, Delwiche LD, Schmidt RJ, Ritz B, et al. Neurodevelopmental disorders and prenatal residential proximity to agricultural pesticides: the CHARGE study. Environ Health Perspect. 2014;122(10):1103–9.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6200179/

9. Eaton DL, Daroff RB, Autrup H, Bridges J, Buffler P, Costa LG, Coyle J, McKhann G, Mobley WC, Nadel L, Neubert D, Schulte-Hermann R, **Spencer PS**. Review of the toxicology of chlorpyrifos with an emphasis on human exposure and neurodevelopment. Crit Rev Toxicol. 2008;38 Suppl 2:1-125. https://www.ncbi.nlm.nih.gov/pubmed/18726789

Signed:

Peter S. Spencer, PhD, FANA, FRCPath

Mitchell Turker, PhD, JD

Caren Weinhouse, PhD, MPH

From:	Philip Smith
To:	Exhibits HAGLU
Subject:	Fw: Testimony Regarding SB 853 and HB 3058 restricting some Neonicotinoid pesticides and banning Chlorpyrifos
Date:	Tuesday, March 26, 2019 11:44:34 AM

To legislature members reviewing materials,

As a longtime beekeeper (my business here in Eugene since 1997, but keeping bees long before), and a concerned citizen, I'm most strongly urging the passage of SB 853 and HB 3058 banning and or limiting Neonicotinoids and Chlorpyrifos. Both of these chemicals are extremely deadly for not only pollinating insects, but other life forms as well. My late autumn and winter losses started spiking around 2008, when 'neonics' usage became more and more prevalent on farms and residential areas. They bioaccumulate (long half lives) and spread easily through water. My losses the past few years have been devastating, and this is true across the USA. The Europeans and other counties have 'seen the light' because of conducting thorough scientific studies, and banned 'neonics'. Their losses have decreased dramatically, while ours continue to climb. Bayer-Monsanto, the largest makers of 'neonics', try to confuse and divert attention by citing Varroa mites as main cause of bee die-offs. Don't be fooled! While they can be devastating to bee colonies if left untreated, beekeepers in general are fastidious in their controlling mite populations.
Please peruse Gary Rondeau's excellent studies on this matter. This is a life or death matter regarding our precious environment, and again, I'm strongly urging positive action on these matters. There are already practical organic alternatives used with great success regarding pest insects, these deadly chemicals will only hasten overall destruction. Thanks for your consideration.

Philip Smith
Eugene beekeeper

----- Forwarded Message -----
From: Gary Rondeau <gary@asiimaging.com>
To: "haglu.exhibits@oregonlegislature.gov" <haglu.exhibits@oregonlegislature.gov>; Lisa Arkin <larkin@beyondtoxics.org>; Krystal Abrams <kabrams@beyondtoxics.org>
Sent: Tuesday, March 26, 2019, 12:19:51 AM PDT
Subject: Testimony Regarding SB 853 and HB 3058 restricting some Neonicotinoid pesticides and banning Chlorpyrifos

To who it may concern,

I am Gary Rondeau, a beekeeper and a scientist living in Eugene Oregon. I have studied the problem posed by insecticides on honeybees and other invertebrates beginning in about 2010 when I personally started to have trouble keeping my bees alive. I took on the task of identifying the most likely culprits for our bee declines and colony collapse that beekeepers across the country were experiencing. Beekeepers have been dealing with pesticides for many years, so I was at first not convinced that pesticides were the issue. However, the new class of pesticides that were becoming popular, the neonicotinoids, had some problematic properties that raised red flags. The issue that bothered me was what happened if you had low doses of the pesticide present for long periods of time. I looked at various research papers and concluded that this was an issue that needed further attention. I wrote a blog article on the subject that eventually became a published article: https://www.nature.com/articles/srep05566

Delayed and time-cumulative toxicity of imidacloprid in bees, ants and termites
Gary Rondeau , Francisco Sánchez-Bayo , Henk A. Tennekes , Axel Decourtye , Ricardo Ramírez-Romero & Nicolas Desneux

Scientific Reports volume4, Article number: 5566 (2014)

The article has been cited many times and I like to think of it as a chink in the armor that allowed the

European Union to effectively ban the neonicotinoid pesticides throughout Europe.

In the process of learning about pesticides I have come to a much better understanding of their biological mechanisms and their environmental shortcomings. This has resulted in two blog articles that are not overly technical which I believe would benefit decision makers to understand the issues at hand. The links are here:

https://squashpractice.com/2014/06/15/the-mechanisms-of-neuro-toxic-pesticides/

https://squashpractice.com/2017/12/03/threshold-mechanisms-in-acetylcholine-pathway-insecticides-and-environmental-safety/

The point I wish to stress in the second article is that a key means to ensure environmental safety for chemical pesticides is that they exhibit a strong "threshold" type of non-linear dose-response action. Pesticides that exhibit strong threshold action include the organophosphate and carbamate classes of chemicals. Strong threshold action means that low residual doses of these chemicals are relatively benign. In contrast, chemicals without a strong threshold action begin to sicken target and non-target organisms at sub lethal doses and can pose unacceptable environmental risks at almost undetectable levels when organisms are continuously exposed to these nerve toxins.

Finally, recent studies have shown that the neonicotinoids not only attack synaptic nervous system receptors, but that these same receptors are commonly present on insect immune cells. These studies have provided the mechanism for what has been observed in the field, that colonies exposed to low levels of neonicotinoids often succumb to a pathogens, often multiple pathogen species when colony collapse occurs. I reference several of these studies in the articles linked above.

The neonicotinoids are a very dangerous environmental hazard. They are likely a significant factor in the widely reported insect apocalypse where large fractions of the wild insect populations have disappeared. The neonics are water soluble so they move when it rains, eventually finding their way to the oceans. We need to stop using them immediately and hope that some of the lost insect diversity will recover.

Below are copies of the linked articles from my blog.

Thank you for your consideration.

Gary Rondeau, Ph.D.

1025 Elkay Drive,

Eugene, OR 97402

The Mechanisms of Neuro-toxic Pesticides

, 2014Beekeeping, Ideas, Pesticides, Popular, Toxics

ɔf Neuro-toxic Pesticides"

Post navigation

Previous Next

es have become part of the chemical landscape that we all live in. To be able to make bout the use and regulation of these chemicals, it's important to understand how they odern pesticides are chemicals that interfere in some way with the nervous system. The chemical interaction with the nervous system function can shed light on the effectiveness on its physiological effects at residual levels. We will start by looking at how some of the the nervous system work, because it will be disruption of those processes that lead to toxic look at the mode of action for three major classes of pesticides and how they specifically function. In a future article we will look at how the specific mechanisms of action can lationships.

n Function – Neurons, action potentials, sodium and potassium ons channels, and ion pumps

of insects and humans share many common features, starting with the basic structure of tions on the same theme in different parts of the organism. Terminal branches can attach neurons at synapses, or through motor synapses to muscle cells. Individual neurons are x, interacting networks by the synaptic connections. Information processing involves rom many neurons and generating an output. When the summed stimulus is high enough, rate an electrical pulse that is sent along the axon and which will, in turn, stimulate neurons connected through synapses to the axon branch terminals.

s accomplished by way of "action potentials", which are short electro-chemical pulse that on axon. The short pulse-like nature of the nerve signals are generated and maintained by d" ion channels and ion pumps. Ion pumps use the cellular energy store, ATP, to move n ions across the cell membrane, setting up a concentration gradient across the membrane sting potential" of about -70mV from the inside to the outside of the nerve cell. Once this d, then merely opening ion channels in the cell wall allows the sodium or potassium ions the membrane and move the potential closer to zero. Nature's trick, that turns this process tion processing network, is to open the ion channels which depolarize the neuron with a ion associated with the membrane potential. Once the membrane potential rises from its "threshold" the voltage gated channels open, steepening the rising edge into the action . The figure below is a nice schematic of the 'anatomy' of the action potential.

)07. DDT, pyrethrins, pyrethroids and insect sodium channels.

/ way of the action potentials, which propagate along the axons and terminate at the everal ways the action potential can be interact with cellular structures. We will etylcholine mediated synaptic response because this is the target of several pesticide

se Function – acetylcholine-mediated transmission

is a molecular neurotransmitter that conveys information across the synapse. In the ic steps of the interaction are illustrated. Action potentials, those pulses of neural activity, es containing ACh to release the ACh molecules into the synaptic cleft, the junction wo cells. The ACh quickly diffuses across the narrow junction region and is captured by rs (AChRs) that are part of ion channel molecules. The AChRs that have captured an the ion channel and allow Na+ ions to enter the post-synaptic neuron. The binding is

the ion channels rapidly open and close as the ACh molecules latch and unlatch from the
nwhile, another ACh receptor is also present in the synaptic junction called
(AChE). This molecule is an enzyme which rapidly breaks apart the acetylcholine into
effectively ridding the synaptic cleft of the neurotransmitter almost as fast as it is made
of all of this chemical activity is that the AChRs, as an ensemble, are open only for a few
g this time, ions flood into the post-synaptic dendrite, depressing the potential in the down
ng it more likely to generate its own action potential.

ssion leaves out many details. There are many more specialized molecules that are part of
en molecules that are specific for one important function also are involved in unrelated
ls can be specialized and synaptic details can vary. Nevertheless, the basic picture we are
ss much of the animal kingdom. These same basic process happen in the nervous systems
alike. Now let us move on to discuss ways to interrupt these normal processes for

rgeting axonal voltage-gated ion channels

f insecticides target the voltage gated ion channels shown in our cartoon. The
DDT, dieldrin, chlordane) and pyrethroids (e.g. deltamethrin) act by opening these
annels. The molecules hold open the channels and allow ions into the axon that
on. In the depolarized state the neuron is non functional, characterized by paralysis. In
state and paralysis there is a range where the depolarization of the neuron is only partial.
n leaves the neuron susceptible to “false triggering”. A small stimulus that would
an action potential will produce one more easily as the resting potential gradually climbs
ired to launch an action potential. Organisms in this state typically exhibit twitching and
ents as the uncontrolled nerve impulses trigger muscles to move.

ne molecular scale. As organic molecules interact with one another, they can latch onto
y loosely or with tenacity depending upon the exact shape of the molecules involved and
happens. Binding that occurs via the covalent sharing of electrons is usually very strong,
t and irreversible. In contrast, many biological molecules interact through polar or Van
t are much weaker. Such interactions may last for a fleeting amount of time before
pull them apart. Weak binding is reversible and can be characterized by a dissociation
es to break the bond due to random and thermal fluctuations.

esticide chemicals, stronger bonds mean the insecticide is spending more time at the
ency is higher. Frequently it is just how tenacious the binding that determine the potency

known as cytochrome P450 enzymes are always on the lookout for foreign chemicals
break down into smaller parts in the process of metabolizing and eliminating unwanted
ithin a few hours much of a foreign chemical will be metabolized and eliminated from the
olecules are not as easily digested by the cytochrome P450s so once toxins are bound to

ey are more immune to detoxification.

rgeting the acetylcholine pathway

sses of pesticides that disrupt the acetylcholine pathway. We will start by looking at the se they have the simplest mechanism, similar to the “direct action” of the pyrethroids ind strongly to the AChRs. Binding causes he ion channels to open so Na+ ions can flow ike the normal acetylcholine response where the channel is only open for about a e neonicotinoid binds the receptors never close. Hence, it takes only a relatively few open y depolarize the neuron. If the ion pumps cannot keep up with the leakage through the ChRs the cell will depolarize. Partial depolarization will make the neuron more excitable; ion leads to paralysis.

e complicated with acetylcholinesterase inhibitors such as the organophosphate and
For these chemicals, the insecticide does not directly bind to neuronal receptors that open
the chemicals bind to the acetylcholinesterase (AChE) enzymes which rid the synaptic
neurotransmitter that is released with normal activity. However, without the AChE to
e ACh continues to bind with AChR ion channels. The figure below shows schematically
hese AChE inhibitors.

n

s bind to the acetylcholinesterace (AChE) sites in the synaptic junction, preventing the
Ch for being removed and recycled from the junction. The acetylcholine continues to
eping their channels open thereby depolarizing the post synaptic neuron. Again,
begin with an over-excitable nervous system, characterized by uncontrolled twitching,

lasses of neurotoxins we have looked at.

ng the most potent biological chemicals known. The chemicals are targeted to interact r molecules that are crucial for nervous system function. This means that very few are required to have a large biological effect. Chemicals used as pesticides need to rget species while remaining benign to non-target organisms and humans. However, much nery is shared across the animal kingdom, so differentiating between target and non-target nge. Often only space and time are used to separate target and non-targets creatures from The environmental effects of pesticide chemicals depends upon the success of various rmful exposure to non-target species. In many cases dilution is the solution, but as and residential uses of potent chemicals become even more widespread, minute residual evitable. Next time we will see why this is more likely to be a problem with some classes an others.

anisms in acetylcholine pathway insecticides and environmental safety

Threshold mechanisms in acetylcholine pathway insecticides and environmental safety

3, 2017Beekeeping, Ideas, Pesticides, Toxics

ms in acetylcholine pathway insecticides and environmental safety"

d at some of the basic principles of nervous system function and how chemicals from ses disrupt normal function. This time we will look in detail about what we can expect haracterization of acetylcholine pathway insecticides based upon their mode of action and vous system. This will get a little more technical than usual. The casual reader may want ations but think about the explanations.

esticides function by disrupting the synaptic acetylcholine pathway.

esticides and the carbamates block the enzyme acetylcholinesterase (**AChE**) such that the urotransmitter, acetylcholine (**ACh**), is not broken down and recycled. up in the synaptic junction and over-stimulates the acetylcholine receptors (**AChR**) on the ane.

ct directly by bonding strongly to the nicotinic acetylcholine receptors (**nAChR**) in a en the receptor ion channel.

icals, the **AChE** inhibitors and the **nAChR** agonists, produce excessive numbers of ne receptors on the post synaptic membrane, which gives rise to a reduction in the post ntial and a propensity to generate action potentials in the post synaptic neuron. Acute en the general level of neural stimulation is sufficient to disrupt the normal physiological sustain life. Clinically, insects and animals poisoned with either class of chemicals are r control, exhibit uncontrolled twitching, eventual paralysis, and death.

nsidering a single synapse and come up with a relationship for the post synaptic tion of the fractional lethal chemical level. We will also consider implications of disruption for an entire neural network. Finally we will seek to understand the cations of threshold versus non-threshold action with these chemicals.

o-chemical function

is governed by neuronal generated "action potentials", rapid electrical potential changes ong the neural axons and terminate in the branching tree of dendrites at synapses where lease of neurotransmitter into the synaptic cleft. The neurotransmitters rapidly diffuse unction and attach to receptors on the post-synaptic membrane. These transiently bound e permeability of the membrane and allow ion currents to flow across the membrane, thus ular electrical potential in the post-synaptic neuron.

fast transients that last 1-3 milliseconds. Diffusion time of **ACh** across the junction is microseconds, and the decay of synaptic free-circulating **ACh** is normally around one ne response of the excitatory post-synaptic potential is slightly slower, typically lasting lliseconds.(1) This allows the post-synaptic neuron to be the summing junction from s, doing some kind of dynamic averaging that determines whether or not the downstream its own action potential. We argue that changing the decay time of **ACh** in the synaptic tly to stimulation that will produce an action potential in the downstream neuron. ne decay time is likely to double the likelihood of the downstream neuron generating its because the amount of post-synaptic charge transfer will be proportional to the length of n the **AChR** receptors, and this open time is within the typical averaging period of the

terase Inhibitors – Consider a single synapse

, produced by a single action potential in the downstream neuron can be written as

ncentration of **AChR**s, is the concentration of **ACh** released by the action potential, constant and is the lifetime of **ACh** in the synaptic junction.

tylcholinesterase inhibitors act is by reducing the number of **AChE**molecules available to on of **ACh** in the synaptic junction. It is reasonable to expect that decreasing the number nolecules will proportionally increase the time it takes for **ACh** molecules to be degraded. raction, , of the **AChE** is bound with inhibitor, then we estimate the ACh lifetime, , in **E** inhibitor as

otential neither nor are affected by the **AChE** inhibitor, so we can express the function of the fraction of inhibited **AChE** as

ually the excess stimulus is lethal which we designate as occurring at .

ard01

at happens as the fraction of bound **AChE** increases. The stimulus enhancement rapidly
the **AChE** becomes unavailable to catalyze the destruction of **ACh**.

you can show that the fraction of excess stimulation at the sub lethal limit compared to
on can be expressed as

is the sub-lethal exposure as a fraction of the lethal level, and is the excess

l with the small dose .

al stimulus level is five times the normal background level of neuronal activity, then 80% e bound. If we ask what happens with an exposure that is 10% of the lethal level, (8% n the increase in simulation is only 1.6% of the increase needed for lethality. In the mulus increase is less-than-linear with exposure, with this "safe residual" effect strongest approaches 1.

e shown that **AChE** inhibition levels need to be 60% to 90% (2), depending upon the , to be lethal. This is more or less in accord with this model where lethality requires most rs to be out of commission, and would suggest that toxicity suppression for residual levels for these chemicals.

Dynamics – Consider the complete network

e nervous system as an ensemble of neurons with average properties. Specifically we are ylcholine pathway, so we define several global average quantities and relationships ylcholine activates receptor sites on the post synaptic membrane that stimulate the post e can express this globally averaged stimulus, , as

onality constant, is the average concentration of synaptic acetylcholine, and is acetylcholine receptor sites. (Unlike the previous section, here is an averaged

n, whereas in Equation [1] described the total release of **ACh** caused by a typical
etylcholine is release into the synaptic junction by action potentials from stimulated
uickly degraded by acetylcholinesterase receptors located in the synaptic cleft. We can
hip as

efficiency of the averaged stimulus at generating additional **ACh** due to stimulus-induced
is the concentration of **AChE** that degrades **ACh** and is a constant involving the

destruction of **ACh**. Combining [6] and [7] and defining , we get erential equation is

e, is

nust be negative or acetylcholine concentration will grow without bounds, conditions, the concentration of **AChE** must be sufficient to prevent runaway growth of on due to **ACh**'s ability to generally stimulate the neural network. Here we are not other neurotransmitters, both agonists and inhibitors, that are included in the network, ng external inputs. However, conditions that place the entire network in a rough dynamic network's ability to involve multiple neurons for information processing. Hence, one e inequality [11] is only weakly maintained, at least in some portions of the neural ould lead to a network that would more optimal for information processing .

etwork with AChE Inhibitors

what happens when we add **AChE** inhibitors and to this picture. The effect of bition will be to reduce the natural concentration **AChE**, , to an available active

{E0} (1-f)

on of bound **AChE** receptors. Substituting [12] into [11] and solving for , we find that bition fraction that will result in uncontrolled growth of the ACh concentration.

his the threshold level at which AChE pesticides produce a lethal effect.

ure on OP poisoning, one comes across the notion of "cholinergic crisis" which suggests condition (3). Although experimentally it is found that relatively large fractions of the ted to cause lethality, this network effect may play the role of the coup de grâce at the .

Receptor Agonists – Neonicotinoids

ceptor agonists such as the neonicotinoids will directly stimulate the post synaptic neuron. tsynaptic stimulation, , due to the neonicotinoid as

le-receptor ion current stimulation, is the **nAChR** concentration and is the fraction ith agonist. When only a few receptors are bound with agonist, the cell's ion pumps will resting potential of the neuron. However, ion pumps are a slow energy-intensive o an open **nAChR**channel, as a rough estimate, an ion pump will only generate ~10^{-5} as t another way, for each open **nAChR** there needs to be ~ 10^{5} ion pump channels in action meostasis. A normal functioning **nAChR** would remain activated only for a few so much less pumping is required to recover from normal activity because of the low

l mechanisms are present for this class of chemical. Instead, the excess stimulation is to the amount of bound receptors, which is itself proportional to insecticide dose. If we ise like we did for equation [5] we discover that in the residual limit where ,

s is proportional to the residual dose.

. for residual levels of these chemicals

f the post-synaptic neuron must be eventually be rectified by metabolic processes that inst the gradient to return the neuron to its normal resting potential. Chemicals that aptic stimulation beyond the natural level will require proportionately more metabolic euron to its resting potential. For the **AChE** inhibitors the excess stimulation is only ynapse is stimulated by the action potential and **ACh** is present. If we wish to find an ulation of the post synaptic neuron, we need to multiply the instantaneous excess naptic duty cycle, . We can rewrite equation [5] for the averaged excess stimulation for **AChE** inhibitor, as

.

ls, the stimulation is constant, with duty cycle equal to one when doing the time

emical pesticides are applied in the field at rates that are designed to produce a lethal effect hen we can compare the relative effects of residual levels of the chemicals

ome small fraction of the lethal level, by normalizing to an application rate where

re the subscripts and refer to the organophosphate or neonicotinoid classes of ly. With these assumptions, combining [16] and [17],

on suggests that for similar residual levels of the two classes of chemicals, the
roduce a much larger average post-synaptic stimulation. We can make estimates for the
ased upon observed average firing frequency, ~1 Hz, and typical action potential duration,

(1-f_L) = 0.5

the threshold term , then taken together the neonicotinoid chemicals will

more averaged post-synaptic stimulation than would similar residual levels of ticides. For sub lethal doses of the pesticides, where nervous system function is not e primary physiological effect one would expect to see would be a much higher metabolic s exposed to low levels of neonicotinoids.

ive Effects

ne the movement of the pesticide from its initial application, its interaction with target or , and its eventual dilution and degradation can have dramatic consequences in terms of ic effect and latent residual toxic effect.(5) An effective and safe pesticide should strongly nism yet remain benign to similar species that are *not* the target organisms. The best way ifferentiation from initial application compared to residual pollutant is to use chemicals llowing properties:

ade in the environment.
sociate at targeted biological binding sites.
; threshold action.

turn. Persistent chemical pollutants have been the bane of the pesticide industry since cetylcholine path insecticides are as bad as the organochlorines, but there is still quite a nembers of this group. The neonicotinoids are said to have around a 1 year soil life, but that to be an optimistic number. Where the chemicals have been used for many years, the continue to increase. Since the neonicotinoids are water soluble, this suggests that what dation is merely dilution and migration. Instead of the chemical disappearing, we find m the source of the application. (6,7,8) Chemicals that are persistent in the environment harvested and target insects are gone can only have deleterious consequences for s. The severity of the consequences depends on the final two properties.

s that bind to targeted receptors can have a wide range of receptor affinity and binding that bind transiently (like the **ACh** molecule itself to **AChR**s) will remain in quasi with the extracellular fluid and will bind to target molecules at a rate that is proportional of the chemical. However, some insecticide chemicals are designed to bind tenaciously to sites. In these cases, the molecules will become trapped at the target site even after most een rid from the organism's body by metabolic processes. In cases with very strong an expect accumulation over time of molecules at the target sites as long as there is any to the chemical. How serious a problem this will be for non-target organisms depends on ether the chemical works with a threshold action or not.

esticide Classes

c pesticides have been widely used for more than 70 years. During that time several s have been developed to target specific neurological receptors. The chart below lists es, includes a common example or two from each class and shows typical properties of the typical chemicals in the table above in light of the requirements we identified as esticide. Note that the organochlorines failed badly because they were so persistent in the oint they have been almost universally banned. They were largely replaced by the th which we've continue to have an uneasy coexistence for the last half-century. Under heir potent effects on humans and other vertebrates, many of the organophosphate forced into retirement. The replacement has been the neonicotinoids, which have the ecificity to invertebrate **nAChR** receptors making the chemicals less toxic to humans and nfortunately, the neonicotinoids fail with regard to all three of the properties for safe and

you can see that the safest chemicals are the carbamates. Typically it takes more chemical neonicotinoids, organophosphates, and carbamates) to kill the target insect, but the emical in the environment is short. It is metabolized relatively quickly, and acts reversibly tors. Finally, it is also an **AChE** inhibitor that has a strong threshold of action effect. e neonicotinoids at the top of the chart. It takes much less neonicotinoid chemical to kill, to its tenacious persistence on the target receptor sites. The chemicals do not degrade very nment so they will continue to accumulate on target and non-target organism synaptic he initial application. And finally, the neonicotinoids produce toxic effects at residual e **AChE** inhibitors. All of the tricks we have in the playbook to segregate between target s fail with the neonicotinoids.

f threshold action for toxicity scaling

e acetylcholine growth rate provides a clear qualitative turning point for the organism. It how such a runaway event can lead to death. Hence, if you wish to model the toxicity nd with such a distinct threshold action, all you have to do is follow the movement of toxin the threshold is reached. This will naturally give you Haber's rule for substances that most of the organophosphate insecticides. For insecticides that don't accumulate on rbamates, one would expect threshold action without a significant time dependence. Once ons reached levels where chemical equilibrium at receptor sites resulted it enough nge the sign of the **ACh** growth rate, the threshold condition would be reached. However, centrations of acetylcholinesterase inhibitors, the molecules disable a few AChE sites and e the synaptic response, but otherwise remain largely benign to the organism. For this e is a very large change in toxic effect with concentration. Despite the continued and concerns with organophosphate pesticides, it should be recognized that they may be nentally safer because of their strong threshold action than the newer neonicotinoids.

ls where there is no distinct threshold condition, the situation is more complicated. The to dead is not accompanied by a convenient mathematical marker like the change in sign pecially at the residual limit, we are left to speculate on the physiological impact of om the toxic chemical. Single molecules will open ion channels and begin to depolarize mal state of affairs would be countered by energy-burning processes in the organism to ion. This is the definition of stress. It is likely that the residual-level stresses to non-target illes' heal for the neonicotinoid insecticides. Very low concentrations of these pesticides switch on compensatory physiological processes that are poorly understood, but likely ple was the discovery that very low levels of the neonicotinoid clothianidin reduced the honeybees to the point where deformed wing virus could replicate. Low levels of the inhibitor chlorpyriphos, the molecules of which in our understanding would be rather o a few of the **AChE** sites, showed no such immune suppression effect.(9) The fact s are involved in less well studied immune system and cellular signaling functions adds to g these pathways will have unintended consequences.(10,11)

residual levels, **AChE** inhibitors are really doing nothing. A small fraction of e out of commission, but even that effect is only apparent when the neuron fires and there way. During the neuron's quiet state the pesticide molecules are benign. Contrast this appens on the postsynaptic membrane with a few neonicotinoid molecules. Single ules hold open **nAChR** channels that will tend to depolarize the neuron. This happens n is in an un-stimulated state. However, given the persistent depolarization by the open Instead the cell must muster energetic processes in an attempt to restore the neuron's may still function.

of immune response as mentioned above, there are likely other detrimental effects from esponse required by residual neonicotinoid poisoning. Trade-offs between energy tain neurological function and more normal activities such as powering flight muscles the observed effects of chronic low level exposure. (12) Another study shows epi-genetic rid-exposed honeybee larva that that strongly affects genes involving metabolism. (13) hat low level neonicotinoid exposure presents, such as impaired navigation, poor learning t time, and immunological impairment may be better understood from the perspective of caused by open nAChR channels than by direct neurological impairment.

sson B. Relation between shapes of post-synaptic potentials and changes in firing toneurones. *The Journal of Physiology*. 1983;341:387-410.

ne and Timothy C. Marrs., *Clinical and Experimental Toxicology of Organophosphates* blished 1992 by Butterworth-Heinemann.

rry C, Bomann S, Pai M, Gernsheimer J. Cholinergic Crisis after Rodenticide *ournal of Emergency Medicine*. 2010;11(5):524-527.

channels versus ion pumps: the principal difference, in principle. Nature reviews gy. 2009;10(5):344-352.

chez-Bayo F, Tennekes HA, Decourtye A, Ramírez-Romero R, Desneux N. 2014 *Delayed toxicity of imidacloprid in bees, ants and termites*. Sci. Rep. 4.

ley JV, Peru KM, Michel NL, Cessna AJ, Morrissey CA (2014) *Widespread Use and f Neonicotinoid Insecticides in Wetlands of Canada's Prairie Pothole Region*. PLoS ONE

ich, Nicholas C. Pflug, Eden M. DeWald, Michelle L. Hladik, Dana W. Kolpin, David M. ry H. LeFevre, *Occurrence of Neonicotinoid Insecticides in Finished Drinking Water and Water Treatment*, Environmental Science & Technology Letters ***2017*** *4 (5), 168-173.*

powit SD, Halden RU. Mass Balance Assessment for Six Neonicotinoid Insecticides Wastewater and Wetland Treatment: Nationwide Reconnaissance in United States *mental Science & Technology*. 2016;50(12):6199-6206.

l. Neonicotinoid clothianidin adversely affects insect immunity and promotes replication n honey bees. *PNAS* **110**, 18466–18471, (2013).

rzyzowska M, Ujazdowska D, Lewicka A, Lewicki S. *Role of a7 nicotinic receptor in the ntracellular signaling pathways*. Cent Eur J Immunol. 2015;40(3):373-9.

otías C, Goulson D, Hughes W.O.H. *A mechanistic framework to explain the effects of neurotoxic pesticides on bees*. Functional Ecology; 2018; 32(8):1921-30.

G., Nieh J.C. A common neonicotinoid pesticide, thiamethoxam, impairs honey bee *Scientific Reports*, 7 (1) , art. no. 1201.

ythe M.J., Malla S., Genereux D.P., Guffanti A., Pavan P., Moles A., Snart C., Ryder T., D.A., Schuster E. and Stöger R., 2013. *Transient exposure to low levels of insecticide works of honeybee larvae* PLOS ONE. 8(7):e68191.

Associated Oregon Hazelnut Industries

Representative Brian Clem, Chair
House Agriculture & Land Use Committee
haglu.exhibits@oregonlegislature.gov

RE: Opposition to HB 3058

Chairman Clem:

The Associated Oregon Hazelnut Industries represents the 800 growers and processors of hazelnuts in Oregon. Oregon is home to 99.9% of the U.S. hazelnut industry and acreage has increased from 28,000 to over 80,000 in the last ten years. The industry is positioned to be one of the largest in Oregon when the newly planted trees reach full production. During the past five years the industry has contributed nearly 250 million dollars to the economy of Oregon annually.

While Oregon is the U.S. hazelnut industry, it represents only 3-5% of the world production. During the past ten years close to 60% of Oregon hazelnuts have gone into the export market. The reason Oregon hazelnuts are in demand throughout the world is largely because of their quality. With careful use of pesticides and additional care in processing, they have become the standard for the world. Although Chlorpyrifos residue has not been found in hazelnuts it does have established Minimum Residue Levels (MRLs) in many countries. If alternative pesticides were used, they may not have established MRLs in which case countries would have the ability to decline importation even though no residue was found.

However, economics is but one aspect of the importance of the industry to the state. Hazelnut trees produce 80 to 100 years. Thus many growers are multigenerational and all have to be long term thinkers. They have a high level of stewardship and sustainability built in to their individual practices. Integrated Pest Management (IPM) is a mainstay in their programs.

In the 1980s growers funded researchers at OSU who imported a wasp to control aphids thus greatly reducing the need for pesticides. This has become a classical biological control success story. More recently they have supported work on the use of another wasp to control Brown Marmorated Stink Bug, which is a growing problem for many crops as well as home owners in cities throughout the country.

Their use of pesticides is based on monitoring to determine the best timing to apply pesticides to achieve the effect they need without decreasing the populations of beneficial insects or applying more product than is absolutely necessary. Chlorpyrifos and neonicotinoid insecticides are important components of IPM programs. If pests do not reach a level worthy of control, growers will not use sprays. When the insect pressure reaches a level that will impact the quality of the crop or the health of the trees, growers will control the population. The critical level has been determined by years of grower funded research at OSU. For specific information on this please see the updated Hazelnut Pest Management Guide for the Willamette Valley at https://catalog.extension.oregonstate.edu/em8328

Chlorpyrifos and neonicotinoids play a very important role because they do affect a wide variety of pests and are used in rotation practices that manage insect resistance. The hazelnut industry continues to find ways to reduce the use of pesticides. They realize that a balance of pests and beneficial insects is very important to long term orchard heath and viability. HB 3058 and SB 853 have the potential to have legislators make pesticide use decisions on a product-by-product basis rather than professional work done by scientists and regulators within our state and federal agencies. Current pesticide use is determined by research done by OSU.

The growers of hazelnuts in Oregon respectfully request your "no" vote on HB 8053. This will enable them to methodically move forward in their integrated pest management programs for the good of the environment, the industry and the state of Oregon.

Sincerely,

Polly Owen

Polly Owen, Research Director
Associated Oregon Hazelnut Industries

Associated Oregon Industries
21595 A Dolores Way NE - Aurora, OR 97002
Phone 503.678.6823 Fax 503.678.6825
hazelnut@oregonhazelnuts.org

Testimony to the Senate Environment and Natural Resources Committee in Support of on HB 3058 and SB 853
By Ramon Ramirez, PCUN

March 26, 2019

Dear Chair Dembrow and Members of the Committee,

On behalf of the 6,543 members of PCUN, I wish to express our full support for HB 3058 and SB 853, which would ban the use of the Pesticide **Chlorpyrifos** in Oregon.

Farmworker's and their families are the backbone of the 8 billion agricultural and reforestation industries in Oregon. Farmworker who toil the land to put food on the American table do backbreaking work while working with dangerous chemicals such as **Chlorpyrifos**

.

It's no coincident the life expediency is 49 years of age compared to 78 years of age for the general population. Farmworker's experience 25% more cancer rate and mis carriages among farmworker women in the county is 50% higher.

According to the GAO, the investigative arm of the US congress, states that over 300, 000 farmworker are poison by pesticides.

Chlorpyrifos is a toxic, nerve agent pesticide proven to cause brain damage in children and pregnant women. It is also known to harm the environment and wildlife. **People come in contact with the chemical through residues on food, and drift from pesticide application.**

Along with Earth Justice, PCUN sued the EPA back in 2018 to ban **Chlorpyrifos** completely. The EPA was scheduled to ban Chlorpyrifos toward the end of the Obama administration due to the recommendation of it's own scientist. In August of 2018, a three-judge panel of the United States Court of Appeals for the Ninth Circuit ordered the EPA to enact its earlier decision to ban Chlorpyrifos nationwide. However, the Trump administration appealed that decision to the full membership of the United States Court of Appeals for the Ninth Circuit. Those proceedings are just starting, now as a matter of fact. We don't know when that court will issue its opinion. Should the 9th Circuit uphold its original order, the Trump Administration will likely appeal that decision to the United States Supreme Court. That Court could certainly stay the opinion of the 9th Circuit or overturn it, and there's no way to know how long such a decision could take.

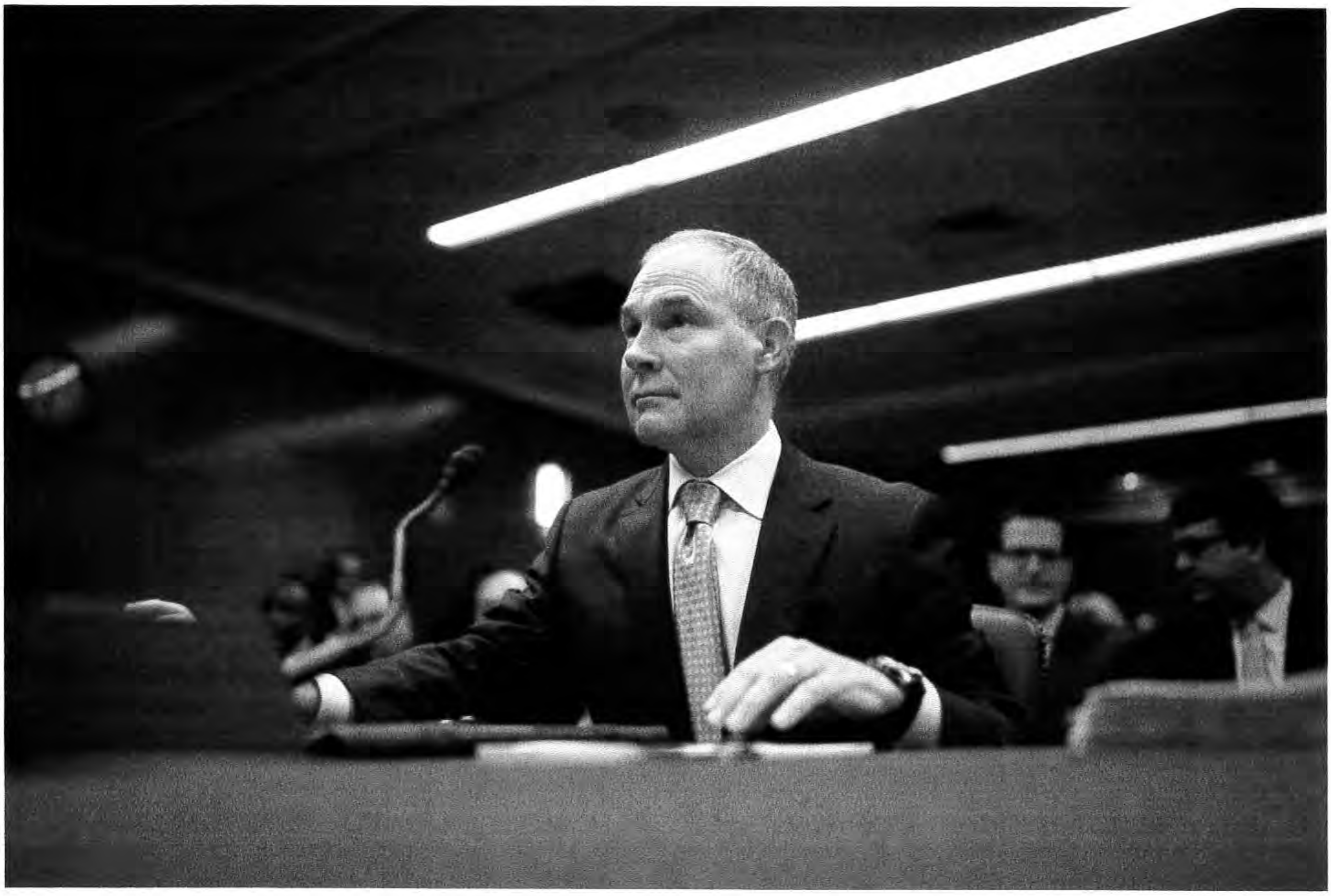
Meanwhile there is a need for state action to protect the thousands of farmworkers and children who will be expose to this deadly pesticide.

Please vote yes on SB 853

Court Orders E.P.A. to Ban Chlorpyrifos, Pesticide Tied to Children's Health Problems

Aug. 9, 2018

Scott Pruitt, just a month after he was confirmed as the Environmental Protection Agency's administrator, rejected a petition by health and environmental groups to ban chlorpyrifos.Tom Brenner/The New York Times



Scott Pruitt, just a month after he was confirmed as the Environmental Protection Agency's administrator, rejected a petition by health and environmental groups to ban chlorpyrifos.Tom Brenner/The New York Times

WASHINGTON — A federal appeals court ordered the Environmental

Protection Agency on Thursday to bar within 60 days a widely used pesticide associated with developmental disabilities and other health problems in children, dealing the industry a major blow after it had successfully lobbied the Trump administration to reject a ban.

The order by the United States Court of Appeals for the Ninth Circuit came after a decade-long effort by environmental and public health groups to get the pesticide, chlorpyrifos, removed from the market. The product is used in more than 50 fruit, nut, cereal and vegetable crops including apples, almonds, oranges and broccoli, with more than 640,000 acres treated in California alone in 2016, the most recent year data is available.

In March 2017, just a month after he was confirmed as the agency's administrator, Scott Pruitt rejected a petition by the health and environmental groups to ban the pesticide. He did so even though the agency's own staff scientists had recommended that chlorpyrifos be removed from the market, based on health studies that had suggested it was harming children, particularly among farmworker families.

A three-judge panel, on a 2-to-1 vote, gave the agency two months to finalize the ban on the product, whose leading manufacturer is DowDuPont. The company, along with others in the pesticide and agriculture industry, had intensely lobbied the E.P.A. and Mr. Pruitt, who resigned under a cloud of ethics scandals last month.

The agency offered no clear response on Thursday when asked how it would respond to the order, other than to point to what it said were remaining questions about one of the studies cited in support of the ban, a Columbia University examination of health effects on children in New York City when the pesticide was used to combat insects in apartment buildings.

That and two other studies mentioned in the agency staff recommendation

examined the development of children whose mothers had been exposed to chlorpyrifos during pregnancy, either in apartments in New York or in agricultural communities where the pesticide is used in California. The effects on children included lower birth weight and reduced I.Q., with farmworkers also reporting loss of working memory and other health consequences that at times resulted in hospital admissions.

"E.P.A. is reviewing the decision," said Michael Abboud, an agency spokesman. "The Columbia center's data underlying the court's assumptions remains inaccessible and has hindered the agency's ongoing process to fully evaluate the pesticide using the best available, transparent science."

The agency could ask the full Ninth Circuit to reconsider the ruling or appeal it to the Supreme Court, while perhaps asking for a delay in the order that it ban the pesticide. Alternatively, the agency could move ahead with the ban.

The court ruled that there was "no justification for the E.P.A.'s decision in its 2017 order to maintain a tolerance for chlorpyrifos in the face of scientific evidence that its residue on food causes neurodevelopmental damage to children," referring to the formal agency process of banning a pesticide. Judge Jed S. Rakoff of the United States District Court for the Southern District of New York wrote the majority opinion, as he was sitting on the Ninth Circuit for the case.

[Read the court's order here.]

Environmentalists and public health advocates celebrated the ruling, which came in response to a lawsuit they filed last year after Mr. Pruitt rejected the ban, a decade after they had first filed a petition with the agency calling for chlorpyrifos to be removed from the market. The court had earlier set a March 2017 deadline for the agency to act, but it had not previously ordered any specific outcome by the agency, a move it has now taken.

The pesticide had previously been banned from most commercial uses in households as an insecticide, but was still legally used to combat insects on farms.

"Finally, decades of poisonous exposures and harm to children and farmworkers will end," said Marisa Ordonia, a lawyer at Earthjustice, an environmental group that handled the legal work on the lawsuit. "E.P.A.'s shameful history of putting industry cronies before the people they are supposed to protect is over."

Erik Nicholson, the national vice president of United Farm Workers of America, said the court order would mean better protection for farmworkers from California to Florida.

"The E.P.A. has put the women and men who harvest the food we eat every day in harm's way too long by allowing the continued use of this dangerous neurotoxin," Mr. Nicholson said in a statement. "We commend the court for doing what E.P.A. should have done years ago. The people who feed us deserve a safe and healthy workplace."

DowDuPont and CropLife, the pesticide industry's leading trade organization, have both disputed that chlorpyrifos, if used properly, poses any health threat to farmworkers, their families or consumers eating fruits and vegetables onto which it is sprayed.

"Chlorpyrifos is a critical pest management tool used by growers around the world to manage a large number of pests, and regulatory bodies in 79 countries have looked at the science, carefully evaluated the product and its significant benefits, and continued to approve its use," Gregg Schmidt, a spokesman for DowDuPont, said in a statement on Thursday. "We expect that all appellate options to challenge the majority's decision will be considered. We will continue to support the growers who need this important product."

March 31, 2018

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Ave., NW
Washington, DC 20460

Dear Administrator Pruitt:

The undersigned organizations write to oppose any changes by the Environmental Protection Agency ("EPA") to the requirements in the Agricultural Worker Protection Standard ("WPS") and Certification of Pesticide Applicators rule (CPA).[1]

Over 15 years ago, an EPA report stated that "pesticide poisoning in the United States remains under-recognized and under-treated...despite the ubiquity of pesticides in our homes, workplaces, and communities, and despite the considerable potential for pesticide-related illnesses and injury."[2] Farmworkers have one of the highest rates of chemical exposures among U.S. workers and they suffer acute pesticide poisoning every year through occupational exposures and pesticide drift. Studies have shown that agricultural workers suffer serious short- and long-term health effects from exposure to pesticides. The WPS and CPA rules provide vital protections from exposure to toxic pesticides for hired farmworkers, pesticide applicators, their families and the general public in communities across the United States. In revising these rules, the EPA recognized that the weight of evidence suggests that the new requirements, "will result in long-term health benefits to agricultural workers, pesticide handlers,"[3] and "to certified and noncertified applicators, as well as to the public and the environment."[4]

After more than a decade of stakeholder input and analysis, the EPA revised the WPS and CPA rule to prevent injury and illness to the children, women and men who work around pesticides in agriculture, or who come into contact with pesticides in other settings. EPA found that the new safeguards are necessary to address the known dangers associated with pesticide use. The WPS applies to hired workers and pesticide handlers who labor in farms, fields, nurseries, greenhouses and forests. The CPA rule governs the training and certification requirements of workers who apply Restricted Use Pesticides ("RUPs") in a variety of settings, including homes, schools, hospitals, as well as agricultural and industrial establishments. RUPs are some of the most toxic and dangerous pesticides on the market.

We are concerned that the EPA may weaken critical safeguards meant to protect agricultural workers, the public, and the environment. Among the many important provisions in the rules, the Agency has stated its intent to reconsider the minimum age protections that prohibit children from applying pesticides, the right of farmworkers to access pesticide application information

---

[1] 82 Fed. Reg. 60, 195 (Dec. 19, 2017); 82 Fed. Reg. 60,576 (Dec. 21, 2017).
[2] National Pesticide Practice Skills Guidelines for Medical and Nursing Practice (January 2003). Available at

[3] 80 Fed. Reg. 67,499 (Nov. 2, 2015)
[4] 82 Fed. Reg. 957 (Jan. 4, 2017)

through a designated representative, and protections for bystanders through "application exclusion zones," which require that an applicator suspend pesticide application if "an unprotected/non-trained person" enters the area around the application equipment.

Undermining these important protections cannot be justified. We urge you to preserve the existing protections and to move forward with full implementation and enforcement.

Respectfully,

Farmworker Justice
Advocates for Basic Legal Equality, Inc.
Alabama Association of Cooperatives
Alianza Nacional de Campesinas / National Farmworker Women Alliance
American Federation of Government Employees (AFL-CIO)
American Federation of Government Employees Local 3354
American Federation of Labor–Congress of Industrial Organizations (AFL-CIO)
Association of Farmworker Opportunity Programs
Azul
Beyond Pesticides
Beyond Toxics
Black Farmers & Agriculturalists Association
Black Mesa Water Coalition
Californians for Pesticide Reform
Calvario City Church
Cardinal Student/Farmworker Alliance
CATA - The Farmworker Support Committee
Central California Environmental Justice Network
Central Florida BREAD
Central Florida Jobs with Justice
Centro Campesino
Centro de los Derechos del Migrante, Inc.
Child Labor Coalition
Citizens Sustainability League of ND
Climate Justice Alliance
Coalition Advocating for Pesticide Safety
Columbia Legal Services
Coming Clean
Community Farm Alliance
CRLA Foundation
Earthjustice
El Pueblo, Inc.
Fair World Project
Fairtrade America
Family Farm Defenders
Farms Not Arms
Farmworker Association of Florida
Farmworker's Self-Help
First Unitarian Church of Orlando

Florida Abolitionist
Florida Center for Fiscal and Economic Policy
Florida Immigrant Coalition
Florida Legal Services, Inc.
Florida Organic Growers
Food Chain Workers Alliance
Friends of Broward Detainees
Friends of Miami-Dade Detainees
Friends of the Earth
Grassroots Global Justice Alliance
Green America
Greene County Democrat
GreenLatinos
GreenRoots
Healthy Building Network
Hispanic Federation
Hispanic National Bar Association
Human Rights Watch
Interfaith Movement for Immigrant Justice
Interfaith Worker Justice
International Labor Rights Forum
Johns Hopkins Center for a Livable Future
Justice in Motion
Labor Council for Latin American Advancement
LatinoJustice PRLDEF
Legal Aid Justice Center, Virginia
LiveWell Colorado
Lomakatsi Restoration Project
Los Jardines Institute
MANA, A National Latina Organization
Media Voices for Children
Migrant Clinicians Network
Migrant Legal Action Program
Mississippi Workers' Center for Human Rights
Nanas, Papas and Friends
National Consumers League
National COSH
National Employment Law Project
National Family Farm Coalition
National Farm Worker Ministry
National Farmworker Alliance
National Latina/o Psychological Association
National Latino Evangelical Coalition
National Latino Farmers & Ranchers Trade Association
National Migrant and Seasonal Headstart Association
New Jersey Coalition for Climate Justice
New Mexico Center on Law and Poverty
Nontoxic Certified

North Carolina Justice Center
Northeastern Environmental Justice Research Collaborative
Northwest Atlantic Marine Alliance
Northwest Center for Alternatives to Pesticides (NCAP)
Northwest Forest Worker Center
Northwest Workers' Justice Project
Oregon Interfaith Movement for Immigrant Justice
Organización en California de Lideres Campesinas, Inc.
Organize Florida
Park Lake Presbyterian Church
PCUN-Pineros y Campesinos Unidos del Noroeste
Peace Roots Alliance
Pesticide Action Network
PLBA Housing Development Corporation
Portland Jobs With Justice
Progressive Caucus Center
Public Citizen
Public Justice
QLatinx
Rural & Migrant Ministry
Rural Advancement Fund of the National Sharecroppers, Inc
Rural Coalition/Coalición Rural
SER Jobs for Progress National Inc.
Soul Fire Farm Institute
South Florida Interfaith Worker Justice
St. Luke's United Methodist Church, Orlando
The Common Market
UFW Foundation
Unite Oregon
United Farm Workers
United Migrant Opportunity Services/UMOS Inc.
University Lutheran Chapel of Berkeley
Voces
Voto Latino
Warehouse Worker Resource Center
WeCount!
Winrock International
Worker Justice Center of New York, Inc.
Workers' Center of Central New York

cc: Ryan Jackson, Chief of Staff, Office of the Administrator
Charlotte Bertrand, Acting Principal Deputy Assistant Administrator, Office of Chemical Safety and Pollution Prevention
Rick Keigwin, Director, Office of Pesticide Programs
Kevin Keaney, Branch Chief, Field and External Affairs Division, Office of Pesticide Programs

Farmworkers represent some of the most economically disadvantaged workers in the U.S. According to the most recent findings of the National Agricultural Workers Survey (NAWS), nearly three-quarters of U.S. farmworkers earn less than $10,000 per year, and three out of five farmworker families have incomes below the poverty level. It is also estimated that there are over three million migrant and seasonal farmworkers (MSFWs) in the United States (Hansen and Donohoe 2003). In Oregon, there are an estimated 174,000 migrant and seasonal farmworkers (Farquhar, Samples, and Ventura et al. 2008).

While injuries occur because of the type of hand labor that farmworkers perform, pesticide related illnesses affect a large quantity of workers each year. According to Hansen (2003), farmworkers suffer from the highest rates in toxic chemical injuries of any group of workers in the United States.

Pesticide Exposure

- The use of pesticides is known to have some effects on the human body, and have numerous health conditions that are associated with pesticide exposure. (McCauley, Anger, Keifer. et al 2006. pg. 953)
- Even though many dangerous pesticides are not used in the U.S., farmworkers are still exposed to pesticides that cause birth defects. (McCauley, Anger, Keifer, et al 2006. pg. 953-954)
- Farmworkers have more skin disorders than other employee in any other industry. (Hansen and Donohoe 2003. pg. 157)
- Pesticide exposure can cause blurred vision, nausea, vomiting, abdominal cramps, cough, wheezing, and sweating. (Hansen and Donohoe, 2003. pg. 157)
- The long term exposure to pesticides can cause permanent damage to the nervous system. (Hansen and Donohoe 2003. pg. 157)
- It is known that pesticide related incidents are underreported for several reasons:
  - Farmworker does not seek medical attention or the cost is a barrier that greatly affects that issue.
  - Farmworker does not have any transportation.
  - Surely there are other reasons, but these are some of the few. (   )

Working and Living conditions

- Farmworkers have to labor throughout the entire year. (Hansen and Donohoe 2003. pg. 155)
- This includes working in any weather, from extreme heat, rain, cold, and the bright sun. (Hansen and Donohoe 2003. pg. 155)
- Farmworkers are required to lift heavy loads, and work among heavy machinery that leads them to have chronic back pain. (Hansen and Donohoe 2003. pg. 155)
- The lack of adequate protective equipment such as masks, helmets, gloves, and coveralls are sometimes not given to the farmworkers. (Farquhar, Samples, Ventura et al. 2008. pg. 277)
- 20% of farmworkers live in employer provided housing, while 58% rent from someone else that is not their employer. Others live in fields, or in unsanitary and overcrowded conditions. (Farquhar, Samples, Ventura et al. 2008. pg. 270)
- These living conditions can lead to the spread of infectious diseases such as tuberculosis. (Farquhar, Samples, Ventura et al. 2008. pg. 270)

Heat Stress

- According to the CDC (Centers for Disease Control and Prevention), workers who are exposed to extreme heat or who work in hot environments may be at risk of heat stress. ( )
- Long hours of work in the sun with little breaks from the heat, and not having portable water to drink are some of the factors that contribute to heat stress. (Hansen and Donohoe 2003)
- Farmworkers are at a greater risk to suffer heat stress. (Hansen and Donohoe 2003)

Respiratory Conditions

- Farmworkers are greatly exposed to many dangerous chemicals (herbicides, fuels, welding fumes, and others) that in the long run have a negative effect on their mucous membranes. (Larson, A. 2001)
- These chemicals can have tremendous effects that cause:
    - Asthma
    - Allergies
    - Emphysema

References:

Arcury, T., Quandt, S. et al. 2001. "Farmworker Pesticide Exposure and Community-Based Participatory Research": *Rationale and Practical Applications*. 109: 429-434.

Farquhar, S., Samples, J. et al. 2008a. "Promoting the Occupational Health of Indigenous Farmworkers". *Immigrant Minority Health*. 10:269-280.

Farquhar, S., Shadbeh, N. et al. 2008b. "Occupational Conditions and Well-Being of Indigenous Farmworkers". *American Journal of Public* Health. 98:1-4.

Hansen, E., Donohoe, M. 2003. "Health Issues of Migrant And Seasonal Farmworkers". *Journal of Health Care for the Poor and Underserved.*14:153-164.

Larson, A., 2001. "Migrant Health Issues":*Environmental/Occupational Safety and Health*. National Center for Farmworker Health. Buda, TX. 2:8-14

McCauley L, Anger K.W., et al. 2006. "Studying Health Outcomes in Farmworker Populations Exposed to Pesticides". *Environmental Perspectives*. 114: 953-960.

March 31, 2018

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Ave., NW
Washington, DC 20460

Dear Administrator Pruitt:

The undersigned organizations write to oppose any changes by the Environmental Protection Agency ("EPA") to the requirements in the Agricultural Worker Protection Standard ("WPS") and Certification of Pesticide Applicators rule (CPA).[1]

Over 15 years ago, an EPA report stated that "pesticide poisoning in the United States remains under-recognized and under-treated...despite the ubiquity of pesticides in our homes, workplaces, and communities, and despite the considerable potential for pesticide-related illnesses and injury."[2] Farmworkers have one of the highest rates of chemical exposures among U.S. workers and they suffer acute pesticide poisoning every year through occupational exposures and pesticide drift. Studies have shown that agricultural workers suffer serious short- and long-term health effects from exposure to pesticides. The WPS and CPA rules provide vital protections from exposure to toxic pesticides for hired farmworkers, pesticide applicators, their families and the general public in communities across the United States. In revising these rules, the EPA recognized that the weight of evidence suggests that the new requirements, "will result in long-term health benefits to agricultural workers, pesticide handlers,"[3] and "to certified and noncertified applicators, as well as to the public and the environment."[4]

After more than a decade of stakeholder input and analysis, the EPA revised the WPS and CPA rule to prevent injury and illness to the children, women and men who work around pesticides in agriculture, or who come into contact with pesticides in other settings. EPA found that the new safeguards are necessary to address the known dangers associated with pesticide use. The WPS applies to hired workers and pesticide handlers who labor in farms, fields, nurseries, greenhouses and forests. The CPA rule governs the training and certification requirements of workers who apply Restricted Use Pesticides ("RUPs") in a variety of settings, including homes, schools, hospitals, as well as agricultural and industrial establishments. RUPs are some of the most toxic and dangerous pesticides on the market.

We are concerned that the EPA may weaken critical safeguards meant to protect agricultural workers, the public, and the environment. Among the many important provisions in the rules, the Agency has stated its intent to reconsider the minimum age protections that prohibit children from applying pesticides, the right of farmworkers to access pesticide application information

---

[1] 82 Fed. Reg. 60, 195 (Dec. 19, 2017); 82 Fed. Reg. 60,576 (Dec. 21, 2017).

[2] National Pesticide Practice Skills Guidelines for Medical and Nursing Practice (January 2003). Available at

[3] 80 Fed. Reg. 67,499 (Nov. 2, 2015)

[4] 82 Fed. Reg. 957 (Jan. 4, 2017)

through a designated representative, and protections for bystanders through "application exclusion zones," which require that an applicator suspend pesticide application if "an unprotected/non-trained person" enters the area around the application equipment.

Undermining these important protections cannot be justified. We urge you to preserve the existing protections and to move forward with full implementation and enforcement.

Respectfully,

Farmworker Justice
Advocates for Basic Legal Equality, Inc.
Alabama Association of Cooperatives
Alianza Nacional de Campesinas / National Farmworker Women Alliance
American Federation of Government Employees (AFL-CIO)
American Federation of Government Employees Local 3354
American Federation of Labor–Congress of Industrial Organizations (AFL-CIO)
Association of Farmworker Opportunity Programs
Azul
Beyond Pesticides
Beyond Toxics
Black Farmers & Agriculturalists Association
Black Mesa Water Coalition
Californians for Pesticide Reform
Calvario City Church
Cardinal Student/Farmworker Alliance
CATA - The Farmworker Support Committee
Central California Environmental Justice Network
Central Florida BREAD
Central Florida Jobs with Justice
Centro Campesino
Centro de los Derechos del Migrante, Inc.
Child Labor Coalition
Citizens Sustainability League of ND
Climate Justice Alliance
Coalition Advocating for Pesticide Safety
Columbia Legal Services
Coming Clean
Community Farm Alliance
CRLA Foundation
Earthjustice
El Pueblo, Inc.
Fair World Project
Fairtrade America
Family Farm Defenders
Farms Not Arms
Farmworker Association of Florida
Farmworker's Self-Help
First Unitarian Church of Orlando

Florida Abolitionist
Florida Center for Fiscal and Economic Policy
Florida Immigrant Coalition
Florida Legal Services, Inc.
Florida Organic Growers
Food Chain Workers Alliance
Friends of Broward Detainees
Friends of Miami-Dade Detainees
Friends of the Earth
Grassroots Global Justice Alliance
Green America
Greene County Democrat
GreenLatinos
GreenRoots
Healthy Building Network
Hispanic Federation
Hispanic National Bar Association
Human Rights Watch
Interfaith Movement for Immigrant Justice
Interfaith Worker Justice
International Labor Rights Forum
Johns Hopkins Center for a Livable Future
Justice in Motion
Labor Council for Latin American Advancement
LatinoJustice PRLDEF
Legal Aid Justice Center, Virginia
LiveWell Colorado
Lomakatsi Restoration Project
Los Jardines Institute
MANA, A National Latina Organization
Media Voices for Children
Migrant Clinicians Network
Migrant Legal Action Program
Mississippi Workers' Center for Human Rights
Nanas, Papas and Friends
National Consumers League
National COSH
National Employment Law Project
National Family Farm Coalition
National Farm Worker Ministry
National Farmworker Alliance
National Latina/o Psychological Association
National Latino Evangelical Coalition
National Latino Farmers & Ranchers Trade Association
National Migrant and Seasonal Headstart Association
New Jersey Coalition for Climate Justice
New Mexico Center on Law and Poverty
Nontoxic Certified

North Carolina Justice Center
Northeastern Environmental Justice Research Collaborative
Northwest Atlantic Marine Alliance
Northwest Center for Alternatives to Pesticides (NCAP)
Northwest Forest Worker Center
Northwest Workers' Justice Project
Oregon Interfaith Movement for Immigrant Justice
Organización en California de Lideres Campesinas, Inc.
Organize Florida
Park Lake Presbyterian Church
PCUN-Pineros y Campesinos Unidos del Noroeste
Peace Roots Alliance
Pesticide Action Network
PLBA Housing Development Corporation
Portland Jobs With Justice
Progressive Caucus Center
Public Citizen
Public Justice
QLatinx
Rural & Migrant Ministry
Rural Advancement Fund of the National Sharecroppers, Inc
Rural Coalition/Coalición Rural
SER Jobs for Progress National Inc.
Soul Fire Farm Institute
South Florida Interfaith Worker Justice
St. Luke's United Methodist Church, Orlando
The Common Market
UFW Foundation
Unite Oregon
United Farm Workers
United Migrant Opportunity Services/UMOS Inc.
University Lutheran Chapel of Berkeley
Voces
Voto Latino
Warehouse Worker Resource Center
WeCount!
Winrock International
Worker Justice Center of New York, Inc.
Workers' Center of Central New York

cc: Ryan Jackson, Chief of Staff, Office of the Administrator
Charlotte Bertrand, Acting Principal Deputy Assistant Administrator, Office of Chemical Safety and Pollution Prevention
Rick Keigwin, Director, Office of Pesticide Programs
Kevin Keaney, Branch Chief, Field and External Affairs Division, Office of Pesticide Programs

Farmworkers represent some of the most economically disadvantaged workers in the U.S. According to the most recent findings of the National Agricultural Workers Survey (NAWS), nearly three-quarters of U.S. farmworkers earn less than $10,000 per year, and three out of five farmworker families have incomes below the poverty level. It is also estimated that there are over three million migrant and seasonal farmworkers (MSFWs) in the United States (Hansen and Donohoe 2003). In Oregon, there are an estimated 174,000 migrant and seasonal farmworkers (Farquhar, Samples, and Ventura et al. 2008).

While injuries occur because of the type of hand labor that farmworkers perform, pesticide related illnesses affect a large quantity of workers each year. According to Hansen (2003), farmworkers suffer from the highest rates in toxic chemical injuries of any group of workers in the United States.

Pesticide Exposure

- The use of pesticides is known to have some effects on the human body, and have numerous health conditions that are associated with pesticide exposure. (McCauley, Anger, Keifer. et al 2006. pg. 953)
- Even though many dangerous pesticides are not used in the U.S., farmworkers are still exposed to pesticides that cause birth defects. (McCauley, Anger, Keifer, et al 2006. pg. 953-954)
- Farmworkers have more skin disorders than other employee in any other industry. (Hansen and Donohoe 2003. pg. 157)
- Pesticide exposure can cause blurred vision, nausea, vomiting, abdominal cramps, cough, wheezing, and sweating. (Hansen and Donohoe, 2003. pg. 157)
- The long term exposure to pesticides can cause permanent damage to the nervous system. (Hansen and Donohoe 2003. pg. 157)
- It is known that pesticide related incidents are underreported for several reasons:
    - Farmworker does not seek medical attention or the cost is a barrier that greatly affects that issue.
    - Farmworker does not have any transportation.
    - Surely there are other reasons, but these are some of the few.
      (   )

Working and Living conditions

- Farmworkers have to labor throughout the entire year. (Hansen and Donohoe 2003. pg. 155)
- This includes working in any weather, from extreme heat, rain, cold, and the bright sun. (Hansen and Donohoe 2003. pg. 155)
- Farmworkers are required to lift heavy loads, and work among heavy machinery that leads them to have chronic back pain. (Hansen and Donohoe 2003. pg. 155)
- The lack of adequate protective equipment such as masks, helmets, gloves, and coveralls are sometimes not given to the farmworkers. (Farquhar, Samples, Ventura et al. 2008. pg. 277)
- 20% of farmworkers live in employer provided housing, while 58% rent from someone else that is not their employer. Others live in fields, or in unsanitary and overcrowded conditions. (Farquhar, Samples, Ventura et al. 2008. pg. 270)
- These living conditions can lead to the spread of infectious diseases such as tuberculosis. (Farquhar, Samples, Ventura et al. 2008. pg. 270)

Heat Stress

- According to the CDC (Centers for Disease Control and Prevention), workers who are exposed to extreme heat or who work in hot environments may be at risk of heat stress. ( )
- Long hours of work in the sun with little breaks from the heat, and not having portable water to drink are some of the factors that contribute to heat stress. (Hansen and Donohoe 2003)
- Farmworkers are at a greater risk to suffer heat stress. (Hansen and Donohoe 2003)

Respiratory Conditions

- Farmworkers are greatly exposed to many dangerous chemicals (herbicides, fuels, welding fumes, and others) that in the long run have a negative effect on their mucous membranes. (Larson, A. 2001)
- These chemicals can have tremendous effects that cause:
    - Asthma
    - Allergies
    - Emphysema

References:

Arcury, T., Quandt, S. et al. 2001. "Farmworker Pesticide Exposure and Community-Based Participatory Research": *Rationale and Practical Applications*. 109: 429-434.

Farquhar, S., Samples, J. et al. 2008a. “Promoting the Occupational Health of Indigenous Farmworkers”. *Immigrant Minority Health*. 10:269-280.

Farquhar, S., Shadbeh, N. et al. 2008b. “Occupational Conditions and Well-Being of Indigenous Farmworkers”. *American Journal of Public* Health. 98:1-4.

Hansen, E., Donohoe, M. 2003. “Health Issues of Migrant And Seasonal Farmworkers”. *Journal of Health Care for the Poor and Underserved.*14:153-164.

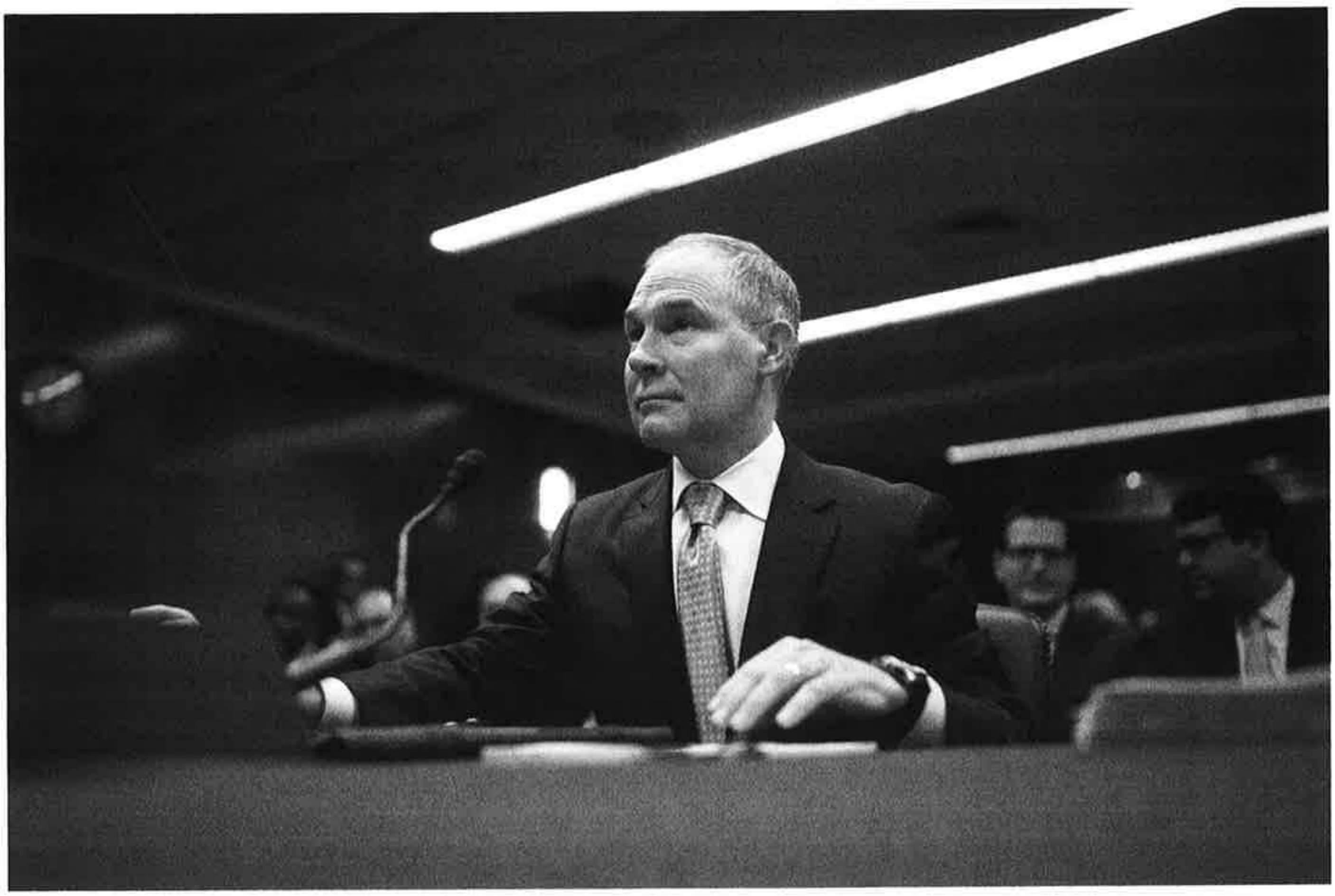
Larson, A., 2001. “Migrant Health Issues”:*Environmental/Occupational Safety and Health*. National Center for Farmworker Health. Buda, TX. 2:8-14

McCauley L, Anger K.W., et al. 2006. “Studying Health Outcomes in Farmworker Populations Exposed to Pesticides”. *Environmental Perspectives*. 114: 953-960.

Court Orders E.P.A. to Ban Chlorpyrifos, Pesticide Tied to Children's Health Problems

Aug. 9, 2018

Scott Pruitt, just a month after he was confirmed as the Environmental Protection Agency's administrator, rejected a petition by health and environmental groups to ban chlorpyrifos.Tom Brenner/The New York Times



Scott Pruitt, just a month after he was confirmed as the Environmental Protection Agency's administrator, rejected a petition by health and environmental groups to ban chlorpyrifos.Tom Brenner/The New York Times

WASHINGTON — A federal appeals court ordered the Environmental

Protection Agency on Thursday to bar within 60 days a widely used pesticide associated with developmental disabilities and other health problems in children, dealing the industry a major blow after it had successfully lobbied the Trump administration to reject a ban.

The order by the United States Court of Appeals for the Ninth Circuit came after a decade-long effort by environmental and public health groups to get the pesticide, chlorpyrifos, removed from the market. The product is used in more than 50 fruit, nut, cereal and vegetable crops including apples, almonds, oranges and broccoli, with more than 640,000 acres treated in California alone in 2016, the most recent year data is available.

In March 2017, just a month after he was confirmed as the agency's administrator, Scott Pruitt rejected a petition by the health and environmental groups to ban the pesticide. He did so even though the agency's own staff scientists had recommended that chlorpyrifos be removed from the market, based on health studies that had suggested it was harming children, particularly among farmworker families.

A three-judge panel, on a 2-to-1 vote, gave the agency two months to finalize the ban on the product, whose leading manufacturer is DowDuPont. The company, along with others in the pesticide and agriculture industry, had intensely lobbied the E.P.A. and Mr. Pruitt, who resigned under a cloud of ethics scandals last month.

The agency offered no clear response on Thursday when asked how it would respond to the order, other than to point to what it said were remaining questions about one of the studies cited in support of the ban, a Columbia University examination of health effects on children in New York City when the pesticide was used to combat insects in apartment buildings.

That and two other studies mentioned in the agency staff recommendation

examined the development of children whose mothers had been exposed to chlorpyrifos during pregnancy, either in apartments in New York or in agricultural communities where the pesticide is used in California. The effects on children included lower birth weight and reduced I.Q., with farmworkers also reporting loss of working memory and other health consequences that at times resulted in hospital admissions.

"E.P.A. is reviewing the decision," said Michael Abboud, an agency spokesman. "The Columbia center's data underlying the court's assumptions remains inaccessible and has hindered the agency's ongoing process to fully evaluate the pesticide using the best available, transparent science."

The agency could ask the full Ninth Circuit to reconsider the ruling or appeal it to the Supreme Court, while perhaps asking for a delay in the order that it ban the pesticide. Alternatively, the agency could move ahead with the ban.

The court ruled that there was "no justification for the E.P.A.'s decision in its 2017 order to maintain a tolerance for chlorpyrifos in the face of scientific evidence that its residue on food causes neurodevelopmental damage to children," referring to the formal agency process of banning a pesticide. Judge Jed S. Rakoff of the United States District Court for the Southern District of New York wrote the majority opinion, as he was sitting on the Ninth Circuit for the case.

[Read the court's order here.]

Environmentalists and public health advocates celebrated the ruling, which came in response to a lawsuit they filed last year after Mr. Pruitt rejected the ban, a decade after they had first filed a petition with the agency calling for chlorpyrifos to be removed from the market. The court had earlier set a March 2017 deadline for the agency to act, but it had not previously ordered any specific outcome by the agency, a move it has now taken.

The pesticide had previously been banned from most commercial uses in households as an insecticide, but was still legally used to combat insects on farms.

“Finally, decades of poisonous exposures and harm to children and farmworkers will end,” said Marisa Ordonia, a lawyer at Earthjustice, an environmental group that handled the legal work on the lawsuit. “E.P.A.’s shameful history of putting industry cronies before the people they are supposed to protect is over.”

Erik Nicholson, the national vice president of United Farm Workers of America, said the court order would mean better protection for farmworkers from California to Florida.

“The E.P.A. has put the women and men who harvest the food we eat every day in harm’s way too long by allowing the continued use of this dangerous neurotoxin,” Mr. Nicholson said in a statement. “We commend the court for doing what E.P.A. should have done years ago. The people who feed us deserve a safe and healthy workplace.”

DowDuPont and CropLife, the pesticide industry’s leading trade organization, have both disputed that chlorpyrifos, if used properly, poses any health threat to farmworkers, their families or consumers eating fruits and vegetables onto which it is sprayed.

“Chlorpyrifos is a critical pest management tool used by growers around the world to manage a large number of pests, and regulatory bodies in 79 countries have looked at the science, carefully evaluated the product and its significant benefits, and continued to approve its use,” Gregg Schmidt, a spokesman for DowDuPont, said in a statement on Thursday. “We expect that all appellate options to challenge the majority’s decision will be considered. We will continue to support the growers who need this important product.”

March 31, 2018

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Ave., NW
Washington, DC 20460

Dear Administrator Pruitt:

The undersigned organizations write to oppose any changes by the Environmental Protection Agency ("EPA") to the requirements in the Agricultural Worker Protection Standard ("WPS") and Certification of Pesticide Applicators rule (CPA).[1]

Over 15 years ago, an EPA report stated that "pesticide poisoning in the United States remains under-recognized and under-treated...despite the ubiquity of pesticides in our homes, workplaces, and communities, and despite the considerable potential for pesticide-related illnesses and injury."[2] Farmworkers have one of the highest rates of chemical exposures among U.S. workers and they suffer acute pesticide poisoning every year through occupational exposures and pesticide drift. Studies have shown that agricultural workers suffer serious short- and long-term health effects from exposure to pesticides. The WPS and CPA rules provide vital protections from exposure to toxic pesticides for hired farmworkers, pesticide applicators, their families and the general public in communities across the United States. In revising these rules, the EPA recognized that the weight of evidence suggests that the new requirements, "will result in long-term health benefits to agricultural workers, pesticide handlers,"[3] and "to certified and noncertified applicators, as well as to the public and the environment."[4]

After more than a decade of stakeholder input and analysis, the EPA revised the WPS and CPA rule to prevent injury and illness to the children, women and men who work around pesticides in agriculture, or who come into contact with pesticides in other settings. EPA found that the new safeguards are necessary to address the known dangers associated with pesticide use. The WPS applies to hired workers and pesticide handlers who labor in farms, fields, nurseries, greenhouses and forests. The CPA rule governs the training and certification requirements of workers who apply Restricted Use Pesticides ("RUPs") in a variety of settings, including homes, schools, hospitals, as well as agricultural and industrial establishments. RUPs are some of the most toxic and dangerous pesticides on the market.

We are concerned that the EPA may weaken critical safeguards meant to protect agricultural workers, the public, and the environment. Among the many important provisions in the rules, the Agency has stated its intent to reconsider the minimum age protections that prohibit children from applying pesticides, the right of farmworkers to access pesticide application information

[1] 82 Fed. Reg. 60, 195 (Dec. 19, 2017); 82 Fed. Reg. 60,576 (Dec. 21, 2017).
[2] National Pesticide Practice Skills Guidelines for Medical and Nursing Practice (January 2003). Available at

[3] 80 Fed. Reg. 67,499 (Nov. 2, 2015)
[4] 82 Fed. Reg. 957 (Jan. 4, 2017)

through a designated representative, and protections for bystanders through "application exclusion zones," which require that an applicator suspend pesticide application if "an unprotected/non-trained person" enters the area around the application equipment.

Undermining these important protections cannot be justified. We urge you to preserve the existing protections and to move forward with full implementation and enforcement.

Respectfully,

Farmworker Justice
Advocates for Basic Legal Equality, Inc.
Alabama Association of Cooperatives
Alianza Nacional de Campesinas / National Farmworker Women Alliance
American Federation of Government Employees (AFL-CIO)
American Federation of Government Employees Local 3354
American Federation of Labor–Congress of Industrial Organizations (AFL-CIO)
Association of Farmworker Opportunity Programs
Azul
Beyond Pesticides
Beyond Toxics
Black Farmers & Agriculturalists Association
Black Mesa Water Coalition
Californians for Pesticide Reform
Calvario City Church
Cardinal Student/Farmworker Alliance
CATA - The Farmworker Support Committee
Central California Environmental Justice Network
Central Florida BREAD
Central Florida Jobs with Justice
Centro Campesino
Centro de los Derechos del Migrante, Inc.
Child Labor Coalition
Citizens Sustainability League of ND
Climate Justice Alliance
Coalition Advocating for Pesticide Safety
Columbia Legal Services
Coming Clean
Community Farm Alliance
CRLA Foundation
Earthjustice
El Pueblo, Inc.
Fair World Project
Fairtrade America
Family Farm Defenders
Farms Not Arms
Farmworker Association of Florida
Farmworker's Self-Help
First Unitarian Church of Orlando

Florida Abolitionist
Florida Center for Fiscal and Economic Policy
Florida Immigrant Coalition
Florida Legal Services, Inc.
Florida Organic Growers
Food Chain Workers Alliance
Friends of Broward Detainees
Friends of Miami-Dade Detainees
Friends of the Earth
Grassroots Global Justice Alliance
Green America
Greene County Democrat
GreenLatinos
GreenRoots
Healthy Building Network
Hispanic Federation
Hispanic National Bar Association
Human Rights Watch
Interfaith Movement for Immigrant Justice
Interfaith Worker Justice
International Labor Rights Forum
Johns Hopkins Center for a Livable Future
Justice in Motion
Labor Council for Latin American Advancement
LatinoJustice PRLDEF
Legal Aid Justice Center, Virginia
LiveWell Colorado
Lomakatsi Restoration Project
Los Jardines Institute
MANA, A National Latina Organization
Media Voices for Children
Migrant Clinicians Network
Migrant Legal Action Program
Mississippi Workers' Center for Human Rights
Nanas, Papas and Friends
National Consumers League
National COSH
National Employment Law Project
National Family Farm Coalition
National Farm Worker Ministry
National Farmworker Alliance
National Latina/o Psychological Association
National Latino Evangelical Coalition
National Latino Farmers & Ranchers Trade Association
National Migrant and Seasonal Headstart Association
New Jersey Coalition for Climate Justice
New Mexico Center on Law and Poverty
Nontoxic Certified

North Carolina Justice Center
Northeastern Environmental Justice Research Collaborative
Northwest Atlantic Marine Alliance
Northwest Center for Alternatives to Pesticides (NCAP)
Northwest Forest Worker Center
Northwest Workers' Justice Project
Oregon Interfaith Movement for Immigrant Justice
Organización en California de Lideres Campesinas, Inc.
Organize Florida
Park Lake Presbyterian Church
PCUN-Pineros y Campesinos Unidos del Noroeste
Peace Roots Alliance
Pesticide Action Network
PLBA Housing Development Corporation
Portland Jobs With Justice
Progressive Caucus Center
Public Citizen
Public Justice
QLatinx
Rural & Migrant Ministry
Rural Advancement Fund of the National Sharecroppers, Inc
Rural Coalition/Coalición Rural
SER Jobs for Progress National Inc.
Soul Fire Farm Institute
South Florida Interfaith Worker Justice
St. Luke's United Methodist Church, Orlando
The Common Market
UFW Foundation
Unite Oregon
United Farm Workers
United Migrant Opportunity Services/UMOS Inc.
University Lutheran Chapel of Berkeley
Voces
Voto Latino
Warehouse Worker Resource Center
WeCount!
Winrock International
Worker Justice Center of New York, Inc.
Workers' Center of Central New York

cc: Ryan Jackson, Chief of Staff, Office of the Administrator
Charlotte Bertrand, Acting Principal Deputy Assistant Administrator, Office of Chemical Safety and Pollution Prevention
Rick Keigwin, Director, Office of Pesticide Programs
Kevin Keaney, Branch Chief, Field and External Affairs Division, Office of Pesticide Programs

Farmworkers represent some of the most economically disadvantaged workers in the U.S. According to the most recent findings of the National Agricultural Workers Survey (NAWS), nearly three-quarters of U.S. farmworkers earn less than $10,000 per year, and three out of five farmworker families have incomes below the poverty level. It is also estimated that there are over three million migrant and seasonal farmworkers (MSFWs) in the United States (Hansen and Donohoe 2003). In Oregon, there are an estimated 174,000 migrant and seasonal farmworkers (Farquhar, Samples, and Ventura et al. 2008).

While injuries occur because of the type of hand labor that farmworkers perform, pesticide related illnesses affect a large quantity of workers each year. According to Hansen (2003), farmworkers suffer from the highest rates in toxic chemical injuries of any group of workers in the United States.

Pesticide Exposure

- The use of pesticides is known to have some effects on the human body, and have numerous health conditions that are associated with pesticide exposure. (McCauley, Anger, Keifer. et al 2006. pg. 953)
- Even though many dangerous pesticides are not used in the U.S., farmworkers are still exposed to pesticides that cause birth defects. (McCauley, Anger, Keifer, et al 2006. pg. 953-954)
- Farmworkers have more skin disorders than other employee in any other industry. (Hansen and Donohoe 2003. pg. 157)
- Pesticide exposure can cause blurred vision, nausea, vomiting, abdominal cramps, cough, wheezing, and sweating. (Hansen and Donohoe, 2003. pg. 157)
- The long term exposure to pesticides can cause permanent damage to the nervous system. (Hansen and Donohoe 2003. pg. 157)
- It is known that pesticide related incidents are underreported for several reasons:
    - Farmworker does not seek medical attention or the cost is a barrier that greatly affects that issue.
    - Farmworker does not have any transportation.
    - Surely there are other reasons, but these are some of the few. (   )

Working and Living conditions

- Farmworkers have to labor throughout the entire year. (Hansen and Donohoe 2003. pg. 155)
- This includes working in any weather, from extreme heat, rain, cold, and the bright sun. (Hansen and Donohoe 2003. pg. 155)
- Farmworkers are required to lift heavy loads, and work among heavy machinery that leads them to have chronic back pain. (Hansen and Donohoe 2003. pg. 155)
- The lack of adequate protective equipment such as masks, helmets, gloves, and coveralls are sometimes not given to the farmworkers. (Farquhar, Samples, Ventura et al. 2008. pg. 277)
- 20% of farmworkers live in employer provided housing, while 58% rent from someone else that is not their employer. Others live in fields, or in unsanitary and overcrowded conditions. (Farquhar, Samples, Ventura et al. 2008. pg. 270)
- These living conditions can lead to the spread of infectious diseases such as tuberculosis. (Farquhar, Samples, Ventura et al. 2008. pg. 270)

Heat Stress

- According to the CDC (Centers for Disease Control and Prevention), workers who are exposed to extreme heat or who work in hot environments may be at risk of heat stress. (   )
- Long hours of work in the sun with little breaks from the heat, and not having portable water to drink are some of the factors that contribute to heat stress. (Hansen and Donohoe 2003)
- Farmworkers are at a greater risk to suffer heat stress. (Hansen and Donohoe 2003)

Respiratory Conditions

- Farmworkers are greatly exposed to many dangerous chemicals (herbicides, fuels, welding fumes, and others) that in the long run have a negative effect on their mucous membranes. (Larson, A. 2001)
- These chemicals can have tremendous effects that cause:
  - Asthma
  - Allergies
  - Emphysema

References:

Arcury, T., Quandt, S. et al. 2001. "Farmworker Pesticide Exposure and Community-Based Participatory Research": *Rationale and Practical Applications*. 109: 429-434.

Farquhar, S., Samples, J. et al. 2008a. “Promoting the Occupational Health of Indigenous Farmworkers”. *Immigrant Minority Health*. 10:269-280.

Farquhar, S., Shadbeh, N. et al. 2008b. “Occupational Conditions and Well-Being of Indigenous Farmworkers”. *American Journal of Public* Health. 98:1-4.

Hansen, E., Donohoe, M. 2003. “Health Issues of Migrant And Seasonal Farmworkers”. *Journal of Health Care for the Poor and Underserved.*14:153-164.

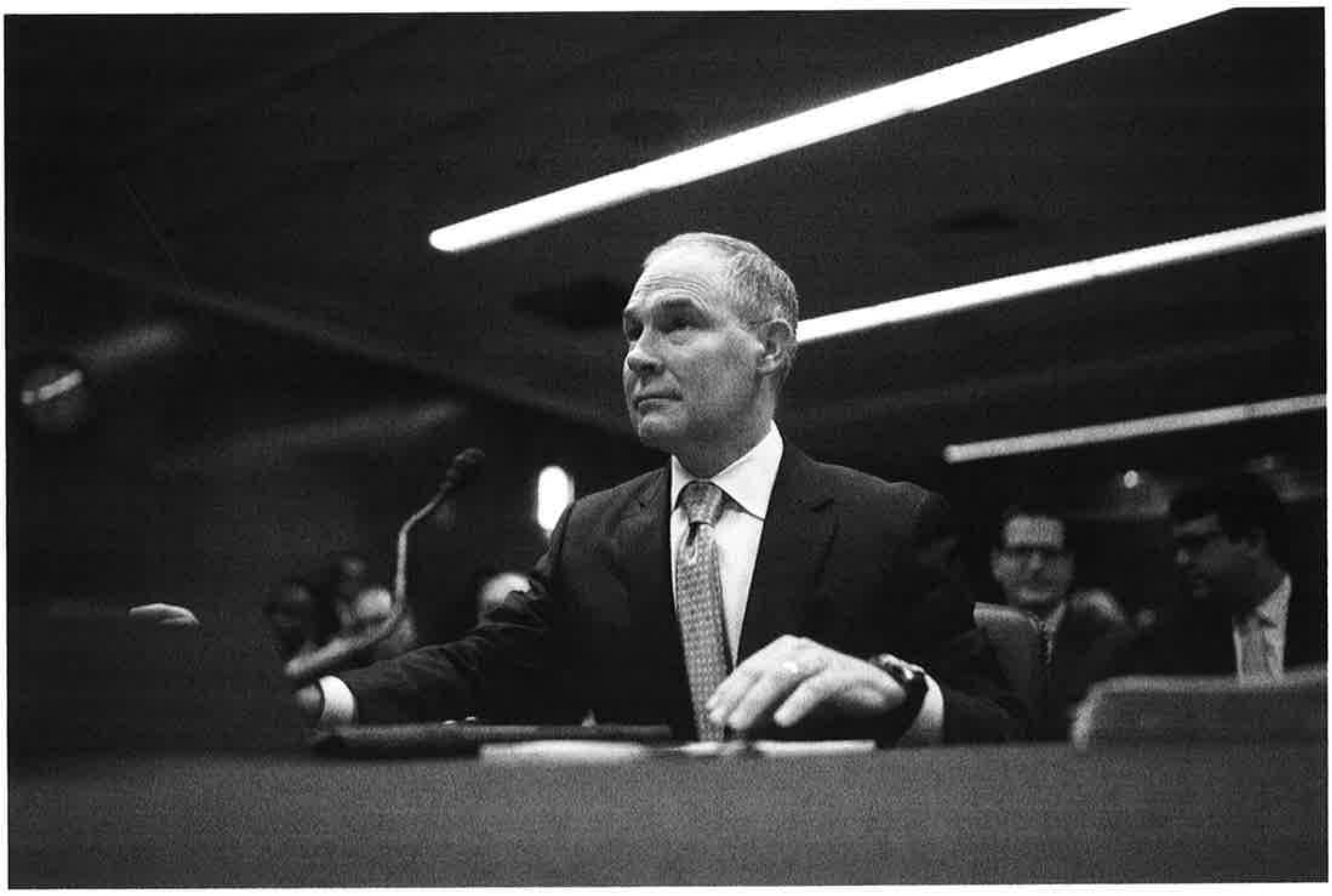
Larson, A., 2001. “Migrant Health Issues”:*Environmental/Occupational Safety and Health*. National Center for Farmworker Health. Buda, TX. 2:8-14

McCauley L, Anger K.W., et al. 2006. “Studying Health Outcomes in Farmworker Populations Exposed to Pesticides”. *Environmental Perspectives*. 114: 953-960.

Court Orders E.P.A. to Ban Chlorpyrifos, Pesticide Tied to Children's Health Problems

Aug. 9, 2018

Scott Pruitt, just a month after he was confirmed as the Environmental Protection Agency's administrator, rejected a petition by health and environmental groups to ban chlorpyrifos.Tom Brenner/The New York Times



Scott Pruitt, just a month after he was confirmed as the Environmental Protection Agency's administrator, rejected a petition by health and environmental groups to ban chlorpyrifos.Tom Brenner/The New York Times

WASHINGTON — A federal appeals court ordered the Environmental

Protection Agency on Thursday to bar within 60 days a widely used pesticide associated with developmental disabilities and other health problems in children, dealing the industry a major blow after it had successfully lobbied the Trump administration to reject a ban.

The order by the United States Court of Appeals for the Ninth Circuit came after a decade-long effort by environmental and public health groups to get the pesticide, chlorpyrifos, removed from the market. The product is used in more than 50 fruit, nut, cereal and vegetable crops including apples, almonds, oranges and broccoli, with more than 640,000 acres treated in California alone in 2016, the most recent year data is available.

In March 2017, just a month after he was confirmed as the agency's administrator, Scott Pruitt rejected a petition by the health and environmental groups to ban the pesticide. He did so even though the agency's own staff scientists had recommended that chlorpyrifos be removed from the market, based on health studies that had suggested it was harming children, particularly among farmworker families.

A three-judge panel, on a 2-to-1 vote, gave the agency two months to finalize the ban on the product, whose leading manufacturer is DowDuPont. The company, along with others in the pesticide and agriculture industry, had intensely lobbied the E.P.A. and Mr. Pruitt, who resigned under a cloud of ethics scandals last month.

The agency offered no clear response on Thursday when asked how it would respond to the order, other than to point to what it said were remaining questions about one of the studies cited in support of the ban, a Columbia University examination of health effects on children in New York City when the pesticide was used to combat insects in apartment buildings.

That and two other studies mentioned in the agency staff recommendation

examined the development of children whose mothers had been exposed to chlorpyrifos during pregnancy, either in apartments in New York or in agricultural communities where the pesticide is used in California. The effects on children included lower birth weight and reduced I.Q., with farmworkers also reporting loss of working memory and other health consequences that at times resulted in hospital admissions.

"E.P.A. is reviewing the decision," said Michael Abboud, an agency spokesman. "The Columbia center's data underlying the court's assumptions remains inaccessible and has hindered the agency's ongoing process to fully evaluate the pesticide using the best available, transparent science."

The agency could ask the full Ninth Circuit to reconsider the ruling or appeal it to the Supreme Court, while perhaps asking for a delay in the order that it ban the pesticide. Alternatively, the agency could move ahead with the ban.

The court ruled that there was "no justification for the E.P.A.'s decision in its 2017 order to maintain a tolerance for chlorpyrifos in the face of scientific evidence that its residue on food causes neurodevelopmental damage to children," referring to the formal agency process of banning a pesticide. Judge Jed S. Rakoff of the United States District Court for the Southern District of New York wrote the majority opinion, as he was sitting on the Ninth Circuit for the case.

[Read the court's order here.]

Environmentalists and public health advocates celebrated the ruling, which came in response to a lawsuit they filed last year after Mr. Pruitt rejected the ban, a decade after they had first filed a petition with the agency calling for chlorpyrifos to be removed from the market. The court had earlier set a March 2017 deadline for the agency to act, but it had not previously ordered any specific outcome by the agency, a move it has now taken.

The pesticide had previously been banned from most commercial uses in households as an insecticide, but was still legally used to combat insects on farms.

"Finally, decades of poisonous exposures and harm to children and farmworkers will end," said Marisa Ordonia, a lawyer at Earthjustice, an environmental group that handled the legal work on the lawsuit. "E.P.A.'s shameful history of putting industry cronies before the people they are supposed to protect is over."

Erik Nicholson, the national vice president of United Farm Workers of America, said the court order would mean better protection for farmworkers from California to Florida.

"The E.P.A. has put the women and men who harvest the food we eat every day in harm's way too long by allowing the continued use of this dangerous neurotoxin," Mr. Nicholson said in a statement. "We commend the court for doing what E.P.A. should have done years ago. The people who feed us deserve a safe and healthy workplace."

DowDuPont and CropLife, the pesticide industry's leading trade organization, have both disputed that chlorpyrifos, if used properly, poses any health threat to farmworkers, their families or consumers eating fruits and vegetables onto which it is sprayed.

"Chlorpyrifos is a critical pest management tool used by growers around the world to manage a large number of pests, and regulatory bodies in 79 countries have looked at the science, carefully evaluated the product and its significant benefits, and continued to approve its use," Gregg Schmidt, a spokesman for DowDuPont, said in a statement on Thursday. "We expect that all appellate options to challenge the majority's decision will be considered. We will continue to support the growers who need this important product."

From: ray seidler
To: Exhibits HAGLU
Subject: I support HB3058
Date: Monday, March 25, 2019 10:28:33 PM

March 23, 2019
Oregon Senate Committee on Environmental and Natural Resources
Oregon House Committee on Agriculture and Land Use.
Salem, OR.

Dear Committee members:
I write as a scientist with about 40 years of research and teaching experiences with environmental microbiology, chemistry, and risk assessments of genetically engineered crops and their pesticides. I am a retired Professor of Microbiology from Oregon State University, and a retired Senior Research Scientist with the United States Environmental Protection Agency. I write to enthusiastically support HB3058 and SB853 to regulate neonicotinoid insecticide sales and use for homeowners and to prohibit the sale and use of the insecticide chlorpyrifos.
As you deliberate the fate of House Bill3058 and Senate Bill SB8534 I ask you keep the following issues in mind.
Neonicotinoids (neos) are chemical modifications of nicotine. Nicotine is the addictive chemical found in tobacco. Bee behavior studies are consistent with bees and bumble bees becoming addicted to exposures to neos and pollinators may actually seek that chemical out repeatedly in "natural" field exposures. 1
Dr Richard Gill, from the Department of Life Sciences at Imperial College, said, "Given a choice, native bees initially appear to avoid neonicotinoid-treated food. However, as individual bees increasingly experience the treated neo-containing food they develop a preference for it. "3 I say, simple 1-time experimental dose/toxicity laboratory studies conducted by industry for regulatory purposes therefore, may not be reflective of real-world accurate assessment of pollinator exposures. Bees may be repeatedly exposing themselves to addictive neos just like addicted humans repeatedly crave exposures to nicotine.

Other political districts in the world have already banned or restricted the use of neonicotinoid insecticides, primarily due to their multiple impacts on honeybees and native bees. For example, EU member states have voted in favor of a total outdoor ban on three neonicotinoid pesticides thiamethoxam, clothianidin, and imidacloprid across the EU in order to protect pollinators. Their use is still allowed in confined greenhouses. 2

It is incredible that over 800 peer reviewed scientific studies have been published in the last 8-10 years showing innumerable impacts of neonicotinoids on various classes of beneficial non-target organisms and little or no regulatory actions have taken place by the United States regulators. 4
Studies have shown the toxic reach of neos extends far beyond just pollinators because this class of insecticides persist for years in soils and are highly mobile, moving from fields into lakes, streams, ponds, wetlands, into neighboring soils, into weedy plants, and even into the shellfish in estuaries. Neos impact activities of microbes, earthworms, and numerous other creatures in soil ecosystems. 5

One of the most important aspects about these Bills is that it will make it harder for homeowners to purchase and use neonicotinoids. This is a good thing because over half of these insecticides are bought and used by home owners.6 As a rule these folks would not be knowledgeable about neo non-target effects, know how to make appropriate dilutions of the concentrated materials, and perhaps not be as concerned about impending rain events when the neos are applied since they spread rapidly in water systems.
The potency of a Neo will vary with the compound but it's about 5,000-10,-000 times greater than DDT. 7. This potency makes it even harder for homeowners to make the appropriate dilutions (if necessary) and to use the insecticide properly. Properly educated and licensed professional applicators are needed to use these insecticides if their use is going to be allowed.

Taken collectively, home owners are probably more to blame than farmers for some of the many issues associated with dispersal of these insecticides into the environment. I strongly support making neos a restricted use allowed to be used only by professional applicators.

The banning of chlorpyrifos should be one of the easiest decisions that any legislature or regulatory body can make. Various studies have documented the positive correlation between exposures to chlorpyrifos (aka Dursban, Lorsban, etc) and damage to the developing brain of babies and young children causing lowered I.Q., delayed motor development and other neurological effects. This pesticide is banned for homeowner use but it is still used commercially on a variety of fruits and vegetables that can be consumed raw (e.g. apples, broccoli). Even low to moderate levels of exposure to the insecticide chlorpyrifos during pregnancy may lead to long-term, potentially irreversible changes in the brain structure of the child, according to a 2012 brain imaging study by researchers from the Columbia Center for Children's Environmental Health.8 This study was the first to take MRI brain scans and noted structural brain changes that correlated with loss of cognitive functions.
As long ago as 2016 an EPA science advisory committee (SAP) cited that epidemiology and toxicology studies suggest there is evidence for adverse health outcomes associated with chlorpyrifos exposures. 9 The decision to ban chlorpyrifos through an EPA decision has been on and off for the last several years. The current administration has been allowed to appeal a recent decision to ban it as recently as February of this year.10
It is long past time that this toxic organophosphate insecticide be banned for sale in Oregon.

Citations:
1.https://www.theguardian.com/environment/2018/aug/29/like-nicotine-bees-develop-preference-for-pesticides-study-shows
2. https://www.theguardian.com/environment/2018/aug/29/like-nicotine-bees-develop-preference-for-pesticides-study-shows

3. https://www.chemistryworld.com/news/europe-to-impose-near-total-ban-on-neonicotinoids/3008965.article

4.https://www.newscientist.com/article/dn25783-neonicotinoid-pesticides-are-bad-news-for-everything/

5. https://www.iucn.org/content/systemic-pesticides-pose-global-threat-biodiversity-an ecosystem-services
6.https://www.ncbi.nlm.nih.gov/pubmed/29952204
7.https://www.xerces.org/wpcontent/uploads/2016/10/HowNeonicsCanKillBees_XercesSociety_Nov2016.pdf
8. https://www.mailman.columbia.edu/public-health-now/news/prenatal-exposure-insecticide-chlorpyrifos-linked-alterations-brain-structure
9. https://www.epa.gov/sites/production/files/2016-10/documents/session_7f_chlorpyrifos_update.pdf
10. https://www.reuters.com/article/us-usa-epa-pestocide/epa-wins-new-chance-to-argue-against-pesticide-ban-idUSKCN1PW20B

Raszka Shelley

From: Rebecca Eigel <user@votervoice.net>
Sent: Thursday, March 21, 2019 8:26 AM
To: Exhibits HAGLU
Subject: HB 3058 and SB 853

Dear Chair Clem,

HB 3058 and SB 853 open the door to the legislators making pesticide use decisions. Are they farmers and know the benefits of these pesticides? Why are legislators trying to make life harder on Oregonians? Who are they getting their information from? Are their informants knowledgeable as they make these bills?

What is going on in the legislator this year? This year has some horrible bills. It looks to me like the legislator and governor are making the state of Oregon unsustainable. If the legislator keeps making bills to ship jobs out of the state, costing farmers and ranchers more money, then where will the the jobs be? It seems like the Oregon government will have all of the employees and no one to pay them, because the tax payers will leave the state. Which means no more money.

Sincerely,

Rebecca Eigel
33101 Conser Pl
Tangent, OR 97389
eigelr@yahoo.com

Just How Harmful is Chlorpyrifos?

On August 9th, 2018, the Ninth Circuit Court of Appeals directed the U.S. Environmental Protection Agency ("EPA") to "revoke all tolerances and cancel all registrations for chlorpyrifos within 60 days."[1] The reasoning behind this holding is summarized below.

- "Chlorpyrifos, an organophosphate pesticide **initially developed as a nerve gas during World War II,** was approved in 1965 in the United States as a pesticide for agricultural, residential, and commercial purposes." *Id.* at 819.

- **The EPA has known about the pesticides negative effects** on childhood development since at least 1998. At that time the EPA cancelled all residential uses of the pesticide, because of the **"acute dietary risks" for "infants, all children, and nursing females."** *Id.*

- Then in 2008, the EPA wrote a paper on the pesticide, which concluded that **chlorpyrifos "likely played a role in low birth rate and delays in infant mental development,"** as was observed in studies. *Id.*

- A Science Advisory Panel concluded in 2011 that there was **persuasive evidence that** the pesticide had enduring effects on the Central Nervous System. **Exposure to the pesticide has been associated with "adverse neurodevelopmental effects in children, including abnormal reflexes, pervasive development disorder, and attention and behavior problems."** *Id.*

- This case involved a petition to the EPA to ban the pesticide chlorpyrifos from 2007. The Court found the EPA's "delay in responding to the 2007 Petition 'egregious,' especially '[i]n view of **[the] EPA's own assessment of the dangers to human health** posed by this pesticide,' noting that the EPA had recently **'reported that chlorpyrifos poses such a significant threat to water supplies that a nationwide ban on the pesticide may be justified**.' *Id.* at 820.

- Federal Law requires the EPA to ban pesticides from use on food products unless, "There is a reasonable certainty that no harm will result from aggregate exposure to the pesticide."[2] The court found that **for nearly two decades, the EPA has documented the adverse effects of chlorpyrifos** on the physical and mental development of American infants, **yet over the past decade, the agency has stalled on responding to petitions to ban the pesticide.** *Id.* The EPA's only defense to this lawsuit, was that the court has no jurisdiction to hear the case. They did not deny the merits of the claim. *Id.* Accordingly, the court granted the petition for review, and remanded the case back to EPA with directions to cancel all registration for chlorpyrifos.

The Court said, "If Congress's statutory mandates are to mean anything, the time has come to put a stop to this patent evasion." *Id.* **If the health of our children in Oregon is to mean anything, the time has come to place a statewide ban on chlorpyrifos.**

---

[1] *League of United Latin American Citizen's v. Wheeler*, 899 F.3d 814 (9th Cir. 2018).
[2] *Id.* at 817. Quoting 21 U.S.C. § 346a(b)(2)(A)(ii).

OREGON CHAPTER SIERRA CLUB
1821 SE ANKENY ST • PORTLAND, OR 97214
PHONE (503) 238-0442 • FAX (503) 238-6281
OREGON.CHAPTER@SIERRACLUB.ORG
WWW.OREGON.SIERRACLUB.ORG

SIERRA CLUB
FOUNDED 1892

To: Members of the House Committee on Agriculture and Land Use
From: Rhett Lawrence, Sierra Club, Oregon Chapter
Date: March 26, 2019
RE: House Bill 3058

Chair Clem and members of the Committee: My name is Rhett Lawrence and I'm the Conservation Director for the Oregon Chapter of the Sierra Club. On behalf of the more than 25,000 Sierra Club members in Oregon, I am pleased to submit these comments in support of House Bill 3058.

As an organization with a long history of working to protect public health and wildlife in Oregon, we believe the common-sense protections of House Bill 3058 are worthy of your support. As you know, HB 3058 would prohibit the use and sale of the insecticide *chlorpyrifos* in Oregon and would restrict use of neonicotinoid pesticides to licensed pesticide applicators. Both of these actions would be beneficial to Oregonians and to the natural environment in our state.

Chlorpyrifos is a highly toxic organophosphate insecticide that is used on a wide variety of crops, putting farmworkers and fish and wildlife at risk. The federal Environmental Protection Agency had undertaken an effort to ban chlorpyrifos use on food crops several years ago, but abandoned that work under pressure from chemical companies. Though the EPA acknowledged the devastating effects the chemical is likely to have on endangered fish, birds, mammals, reptiles, amphibians, invertebrates, and plants, there seems to be no further action planned at the federal level. Now it is time for Oregon to step up and ban this highly toxic insecticide.

Neonicotinoids are widely used pesticides that are wreaking havoc in our environment, with particularly grave impacts on pollinators. Many Oregonians first were made aware of the awful effects of neonics several years ago when at least 25,000 bumblebees were killed in a single application in a Target parking lot in Wilsonville. And for that one highly visible incident, there are hundreds of others we don't hear about. And neonics have similar impacts on birds and on the insects and other invertebrates that birds depend on for food.

This bill's provisions to classify neonicotinoids as "restricted use" in Oregon would allow for their continued use, but would require applicators to receive training and certification on how to do so safely. Oregon currently requires certification and training in order to buy or use over 500 other pesticides. Adding neonics to this list is a common-sense step to minimize the risk of harm to bees and to the rest of us. There’s simply no good reason for private citizens to be able to buy these products off the store shelf without any sense of how to use them properly.

For these reasons, the Sierra Club strongly supports House Bill 3058 and we urge Committee members to do the same. Thank you very much for the opportunity to provide this testimony and please let me know if I may be of any further assistance to the committee.

HM • CLAUSE

March 25, 2019

House Agriculture and Land Use Committee
900 Court Street NE
Salem, OR 97301

Dear Representatives:

HM.Clause, Inc. is a global vegetable seed company which sells seed to growers in Oregon. We are in opposition to House Bill 3058, and respectfully submit this letter for the Senate Committee hearing record on Tuesday, March 26.

If passed and signed into Law, House Bill 3058 would ban the sale, purchase or use of chlorpyrifos, and products containing chlorpyrifos, in the state of Oregon. Chlorpyrifos (also known as Lorsban) is an important pest product used on many crops produced in the state of Oregon. It has been used very successfully for many years to control insect pests such as seed corn maggot and seed corn beetle that cause significant damage to planted seeds. Our customers purchase vegetable seeds with Lorsban included in the seed treatment mix. Losing this effective pest management tool would be bad for Oregon producers as there is a limited number of registered products available for use. Currently as far as we know, chlorpyrifos is the only contact insecticide available for those crops as a part of a seed treatment. Removing this product from Oregon crop production would allow for a competitive and unfair advantage in favor of non-Oregon producers who continue to use this product.

House Bill 3058 also designates pesticides classified as neonicotinoids as a restricted-use. The new designation would mean that Oregon producers would have to obtain a pesticide applicator license to purchase and use neonicotinoid products on their crops. Therefore, the new designation imposes a burden on Oregon who would have to acquire a license to apply a product they are already using and authorized to apply without a license.

On a broader scale, our Industry is concerned about losing a product that has a 40-year history of success. More than 4,000 studies and reports have been done on this product and it is still registered for use by the EPA. We are even more concerned that instead of depending upon our state and federal agencies to make the decisions to ban certain pesticide products based on scientific data this Legislation sets a precedent for any legislative action to dictate what growers can and cannot use to protect their crops from insects and other pests.

We ask for your vote in opposition to House Bill 3058. Thank you for your consideration and for the opportunity to comment.

Respectfully,

HM.CLAUSE, Inc.

By:

Richard D. Winn
Quality Assurance Manager
HM.CLAUSE, Inc.
(208) 891-0740
rick.winn@hmclause.com

From:	launa@frahmfresh.com
To:	Exhibits HNR
Cc:	launa@frahmfresh.com
Subject:	HB 3058
Date:	Monday, March 25, 2019 6:26:26 PM

Certain chemicals are vital for farmers to produce pest free crops. One of those vital chemicals is chlorpyrifos. There is no alternative for the control of certain pests. It is vital for chlorphrifos to be legal to use in specialty crops.

With the withdrawal of chlorphrifos from the market, public health programs will not have the tools to control the invasive species act. Other countries have strong phyto-sanitary requirements.

Please do not regulate away chemicals that are necessary for farmers. Scientists should be the ones who make decisions on the use of vital chemicals. Farmers in Oregon should be on an equal playing field with farmers in other states and countries.

Thank you,

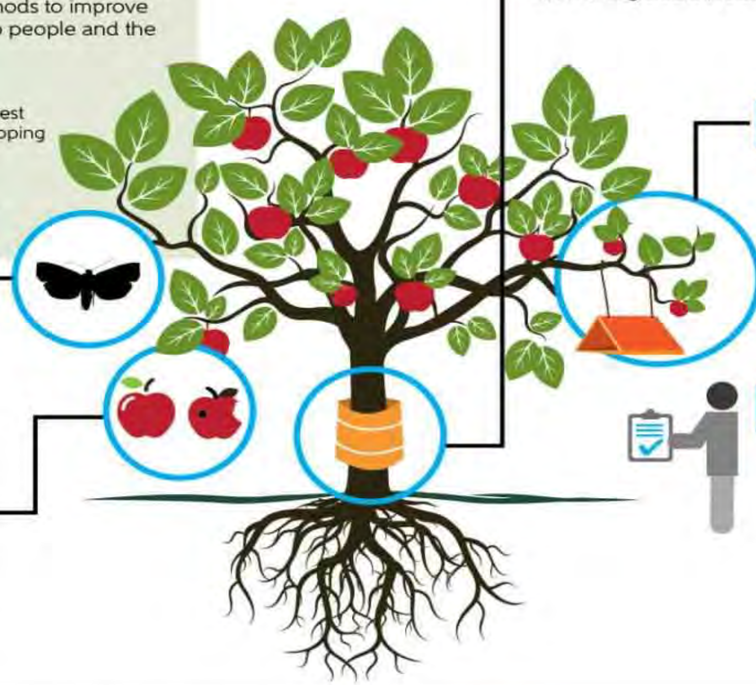
Rod and Launa Frahm
418 King Avenue
Ontario, OR 97914

What is IPM?

Integrated Pest Management is a science-based approach that combines a variety of techniques. By studying their life cycles and how pests interact with the environment, IPM professionals can manage pests with the most current methods to improve management, lower costs, and reduce risks to people and the environment.

IPM tools include:

- Alter surroundings
- Add beneficial insects/organisms
- Grow plants that resist pests
- Disrupt development of pest
- Prevention of pest problem developing
- Disrupt insect behaviors
- Use pesticides



1 IDENTIFY/ MONITOR

Determine the causal agent and its abundance (contact your local extension agent for help).

2 EVALUATE

The results from monitoring will help to answer the questions: Is the pest causing damage? Do we need to act? As pest numbers increase toward the economic threshold further treatments may be necessary.

3 PREVENT

Some pest problems can be prevented by using resistant plants, planting early, rotating crops, using barriers against climbing pests, sanitation, and sealing cracks in buildings.

4 ACTION

IPM uses multiple tools to reduce pests below an economically damaging level. A careful selection of preventive and curative treatments will reduce reliance on any one tactic and increase likelihood of success.

5 MONITOR

Continue to monitor the pest population. If it remains low or decreases, further treatments may not be necessary, but if it increases and exceeds the action threshold, another IPM tool should be used.

WHERE CAN YOU PRACTICE IPM?

Buildings and Homes:
Inspect, identify pests, keep pests out, clean to deny pests food and water, vacuum, trap, or use low-risk pesticides.

Farms:
Check for pests/pest damage regularly, identify accurately, choose pest-resistant plant varieties, encourage/introduce beneficial insects, time planting to avoid pests, and if needed use low-risk pesticides.

Managed Natural Systems:
Identify the pest and use management options that have minimal risks to pollinators, humans, and pets.

The Entomological Society of America is the largest organization in the world serving the needs of entomologists and other insect scientists. ESA stands as a resource for policymakers and the general public who seek to understand the importance and diversity of earth's most diverse life form—insects. Learn more at www.entsoc.org.

OREGON SEED COUNCIL

Chair Clem and members of the Committee,

RE: Testimony from Oregon Seed Council on HB 3058 which bans the use of chlorpyrifos in Oregon.

Insect control in Oregon's grass seed and clover seed crops is a critically important part of the overall production system. The impact to the crop and Oregon's ag industry would be extremely significant without the ability to effectively manage our insect pressures. Seed production could quickly lose 30-40% in yield due to the lack of effective insect pest control. This is a very conservative estimate of the impact, and the loss could be greater and possibly up to 100% in some cases.

Oregon is the global leader in grass seed production with approximately 650 million pounds produced each year. A 30% loss of perennial grasses alone would be 140 million pounds of seed. In dollars, this would equate to a loss of approximately $100 million to Oregon's economy and agriculture industry and families.

Grass and clover seed growers in Oregon do not have many registered insecticide options available to implement into their integrated pest management plans. Chlorpyrifos is a critical need for proper and effective IPM. You cannot just simply count the numerous trade names and labels for products and think there are several options for growers. The actual reality is that these crops only have four mode-of-action classes of insecticides available for use. Of those mere four options, one of those does not demonstrate consistent results, and another is limited on its spectrum of insect control nor is it cost effective. This leaves only two optional classes of insecticides. If the state of Oregon eliminates chlorpyrifos, then the growers are left with only one single option.

Proper IPM strategy should include the use of multiple mode-of-action classes. Without chlorpyrifos these growers will be limited to one, pyrethroids, which poses challenges and will create bigger issues. Science has shown that the development of pesticide resistance is accelerated and more prevalent in production systems that do not or cannot utilize multiple modes of action. Furthermore, pyrethroids will not address all the insect control needs facing seed production.

A prime example of resistance is the current situation with the clover seed weevil in our clover seed crop. Due to the lack of insecticide options for clover seed weevil, the Oregon Department of Agriculture issued a Special Local Needs 24C registration for both chlorpyrifos and bifenthrin, a pyrethroid. Growers have used bifenthrin as much as possible because it is less harmful to pollinator populations. However, due to the predominant use of this one mode of action our clover growers are now dealing with a population of seed weevils that is showing strong sign of being resistant to bifenthrin. The only other options currently registered under an SLN 24C is chlorpyrifos. Clover seed weevils left out of control will reduce seed yields by at least 50%. Under current seed production statistics, this would equate to a $15 million-dollar loss to Oregon's clover growers.

Roger Beyer, Executive Director | 503-585-1157 | 494 State Street, Suite 220 | Salem, OR 97301 | www.OregonSeedCouncil.org

In addition to clover seed, chlorpyrifos is also labeled on perennial grasses grown for seed also through a Special Local Needs 24C registration from the Oregon Department of Agriculture. Chlorpyrifos addresses many of the specific insect control needs. Again, without chlorpyrifos the grass seed growers are left with only pyrethroids, which reduces the ability to adequately control some specific pests affecting grass seed production. Examples of specific pests addressed by chlorpyrifos that would not be adequately controlled by the remaining pyrethroids include aphids and garden symphylans.

Pyrethroids are not strong on controlling high aphid population, whereas chlorpyrifos will control these populations. Effective aphid control is not only important to eliminate the piercing-sucking insect from desiccating the crop, but also to prevent the spread of the devastating barley yellow dwarf virus that is vectored by the aphids. BYDV has a significant impact on seed yield and the life of the stand. In all cases, the grass crop must be terminated and replanted to eliminate the virus. Thus, clearly causing significant economic losses.

The garden symphylan is a soil insect that can have a significant impact on stand establishment immediately after seeding. If left unchecked, the symphylans will cause incomplete stand establishment and leave sizeable areas without crop. It has been demonstrated that when chlorpyrifos is used to control other insect pest affecting grass seedling sprout that it also reduces the impact of the symphylans on the newly planted crop. No other registered material has demonstrated this ability.

There are two registered options for control of orchardgrass billbug, both through SLN 24C registration. These options are chlorpyrifos and bifenthrin, and while both are effective there is some observational notes being made that bifenthrin may not be providing as good of control as it once did. There is strong reason to believe that bifenthrin resistance may be developing in this billbug population. Chlorpyrifos is the only other option, and without it both bifenthrin resistance and the loss of billbug control will become a reality.

It is also worth noting that chlorpyrifos is labeled for use only on "perennial grasses grown for seed." Therefore, there is approximately one-third of the total grass seed acres that cannot use chlorpyrifos. This specific labeling helps our industry maintain effective insect control by implementing good rotational use of the available crop protection products. It is important that the perennial grass seed crops continue to utilize chlorpyrifos so that appropriate IPM strategies can be employed across the industry and prevent resistance development.

In summary, chlorpyrifos plays a critical role in the integrated pest management strategies implemented by grass and clover seed producers. The reality is that growers only have two modes-of-action classes available with chlorpyrifos being one of them. If chlorpyrifos is eliminated then there will be a tremendous stress put on the remaining class of pyrethroids, which has already shown signs of resistance development in our production systems. Oregon growers are already limited in their available options and eliminating chlorpyrifos would be a critical loss and would lead to even bigger challenges. Oregon's grass and clover seed industries would suffer significant losses if chlorpyrifos was eliminated as an option for IPM and crop protection.

SES
3-21-19

From: Rose Sacco
To: Exhibits HAGLU
Subject: thanks for HB3058
Date: Monday, March 25, 2019 3:53:44 PM

Thanks for HB3058! I say YES to HB3058! This law is what I have been wanting and waiting for! The birds, bees ,river turtles on the Illinois River here in Cave Junction, OR need your help. Please support HB3058 so we can all be safe and healthy now. Do everything you can to protect our children harm. The future of all life on earth is at stake. Thanks, Rose Sacco

Sent from my iPad

My wife and I are small farmers from Ontario, Oregon specializing in the production of small seeds, both vegetable and alfalfa. We're unique in the fact that we didn't have a start from either of our families and have built a successful operation from scratch through dedication and hard work. It is the production of these small seeds along with very intense management that has made us successful as farmers and business owners, thus spending hundreds of thousands of dollars a year in our local economy.

In the small seed industry, the largest pest that we continually fight is the lygus bug. This bug has devastated seed crops through its piercing and sucking action on the developing making the seed unviable. This results in high cleanouts, less income to the grower, and potentially a complete zero on a crop due to poor germination of the seed. Controlling this pest is a must; otherwise we will be out of business.

Chlorpyrifos is a very important chemical in our toolbox of pesticide chemistries. The place chlorpyrifos has in the seed crops that are labeled; is in what we call the cleanup sprays, both before and after the pollination season. Our goal with the cleanup sprays is to eradicate all pests before introducing bees for the pollination season. Without pollinators, we won't have a seed crop, so we are very careful about taking precautions to take care of them. If we can eradicate all the pests before introducing pollination we have a longer window before we need to spray some softer, bee-safe chemistry during the pollination period, thus reducing overall insecticide use.

Chlorpyrifos is used in seed rotations because of its efficacy, residual and cost. When trying to eradicate insects, the thing you have to keep in mind is you're trying to eradicate all stages; this includes adults, in-stars, nyphs, and you have to remember there are eggs that may be hatching. Since chlorpyrifos has residual it stands a better chance of eradicating all stages and having activity on the eggs that are hatching. Insects have developed resistance to a lot of chemistries over time, but chlorpyrifos has managed to keep its efficacy against the pests that we are going after since its development in 1965. That's pretty amazing for a chemistry to still be effective 54 years later!

These seed crops are our bread and butter for our operation. Without them, our 360 acre farm isn't going to be able to compete with the large corporate farms in our area that are all vertically integrated in other crops. All of the seed crops we raise fall into the "no food, no feed" status, so none of the product will end up in the immediate food source of humans or animals. I'm not asking for a hand-out or a subsidy to keep my farming operation going; I'm asking that you don't take away the tools I need in order to do my job. If this ban goes through, it puts our farm at a major disadvantage to seed producers in other states, pushing us to move our operation elsewhere.

Thank you for your time and if you have any questions feel free to call me at (208) 989-3441.

Ryan Svaty

House Agriculture and Land Use Committee
Chair Representative Brian Clem
Vice Chair Representative Susan McLain
Committee Members

Monday, March 25, 2019
Support for H.B. 3058 pertaining to the sale and use of Chlorypyrifos and Neonicotinoids

Cascadia Wildlands is a regional non-profit conservation organization based in Eugene, Oregon, representing nearly 10,000 members and supporters across the country. Cascadia Wildlands works to protect and restore the wildlands and species in the Cascadia bioregion. Our members live and play in the forests and watersheds of our bioregion and are dependent on them for clean water, fish and wildlife habitat, stable property values, and recreation. We have been longtime supporters of commonsense, science-backed restrictions on the use of persistent environmental toxins that poison water, kill pollinators, undermine biodiversity, and threaten human lives. **Cascadia Wildlands supports H.B. 3058 pertaining to the sale and use of Chlorypyrifos and Neonicotinoids, two commonly used pesticides that have been linked to a wide range of alarming environmental and human health concerns.**

A growing body of scientific research has highlighted the threats that the persistent use of neonicotinoids have for biodiversity, water quality, pollinators, and fish species. Neonicotinoids, or neonics, are a widely used pesticide that have been linked to sharp declines in insect and aquatic invertebrate populations and a prolific contaminant of streams and rivers[1]. Pollinators and other insect populations are the very basis of the terrestrial food chain, and their health affects the stability of bird and mammal populations all the way up. Similarly, invertebrates such as crustaceans and mollusk are the foundation of the aquatic food web and are crucial to the survival of fish and wildlife populations. Because insects and aquatic invertebrates are suffering from exposure to neonics, a host of non-target organisms are also exposed all the way up the food chain.

In April of 2018, the European Union legally recognized the dangers of neonicotinoids and banned their sale and use. While H.B. 3058 would not ban the use of neonics, it would take the important and commonsense step of requiring certification and training before the purchase, sale or dissemination of this highly toxic class of pesticides.

While federal regulation of the brain-harming pesticide chlorypyrifos seems more and more unlikely, now more than ever we need action from the state to ban the use of this particularly

[1] The Xerces Society. "Scientists Urge Action to Protect Waters from Neonicotinoid Insecticides". 3/13/18.

POB 10455 Eugene OR 97440 - ph 541.434.1463 - f 541.434.6494 - info@cascwild.org
www.CascWild.org

alarming poison. Chlorypyrifos is a widely used insecticide linked to infertility, diabetes, respiratory disease, developmental disorders and more. Chlorypyrifos is a nerve agent made to kill insects by binding to enzymes that control the messages passed between nerve cells, effectively breaking down neural communication. When exposed to humans, chlorypyrifos functions the same way, and consistent with exposure to other toxic substances, the most susceptible to adverse health effects are children. Studies following children whose mothers were exposed to chlorypyrifos during pregnancy found that effects on children included memory loss, lower birth weight and lower IQs[2]. Despite this, chlorypyrifos are still commonly used in the logging industry and in agriculture and are applied to more than 50 fruit, nut, cereal and vegetable crops. In a 2018 federal ruling for the EPA to ban chlorypyrifos, the Supreme Court stated that there was "no justification for the E.P.A.'s decision in its 2017 order to maintain a tolerance for chlorpyrifos in the face of scientific evidence that its residue on food causes neurodevelopmental damage to children."

When it comes to neonicotinoids and chlorypyrifos, the United States is lagging behind in standards that protect both the environment and human health. It is long past time to bring our policies concerning these widely recognized poisons up to the standards of science and commonsense. Cascadia Wildlands encourages you to support H.B. 3058 to ban the use of the poison chlorypyrifos and add neonicotinoids to the list of over 500 restricted use pesticides in the state of Oregon.

Thank you for your time, and please do not hesitate to contact me with any thoughts or questions.

Sincerely,

Sam Krop
Grassroots Organizer
Cascadia Wildlands
541.434.1463 / sam@cascwild.org

[2] Lipton, Eric. *New York Times*. "Court Orders E.P.A. to Ban Chlorpyrifos, Pesticide Tied to Children's Health Problems". 8/9/18.

From: sarah mayer <sjm3224@yahoo.com>
Sent: Tuesday, March 26, 2019 11:57 AM
To: SENR Exhibits <SENR.Exhibits@oregonlegislature.gov>
Subject: HB 3058

I would like to voice my support on HB 3058 which will ban the purchase, sale and use of Chlorpyrifos. This bill also lists Neonicotinoids as Restricted Use Pesticides.
These chemicals do not belong in our environment. As a science enthusiast I have studied ornithology, biology, botany, and ecology for the past 40 years. These two chemicals adversely affect so many intricate life systems, with a cascading affect, from bees to butterflies to birds, and continue with unintended consequences up and down the food chain.
Please, stop the sale and use of these toxic chemicals.
Sincerely,
Sarah Mayer
Cave Junction, OR

March 20, 2019

House Committee on Agriculture and Land Use
Oregon Legislature
900 Court St. NE,
Salem Oregon 97301

Dear Chair, Vice Chair and Members of the Oregon Legislature House Committee on Agriculture and Land Use:

We are writing to urge your support and passage of House Bill 3058.

HB 3058 would prohibit the use and sale of an insecticide called chlorpyrifos in Oregon, and would require that "neonicotinoid" insecticides could only be used by licensed pesticide applicators. (A similar bill, Senate Bill 853, is in front of the Oregon Senate).

The undersigned Oregon organizations support SB 853. Not because we are anti-farming. Quite the contrary. We are pro-sustainable agriculture, pro-healthy families and communities, and pro-clean water. We urge you to support these values in looking at the policy proposed in these bills.

The insecticides addressed have serious effects on human and environmental health effects. The need to act on these is imperative.

Chlorpyrifos is Dangerous for Anyone Near an Application

Sold under various trade names (Lorsban, Dursban and others), chlorpyrifos is used to kill insects and mites in many grains, vegetables, nuts, and fruit crops, as well as in non-food crops such as grass seed, Christmas trees and nursery plants. Strawberries, apples, hazelnuts and corn are some of the common foods grown in Oregon that are frequently treated with chlorpyrifos.

Chlorpyrifos is so toxic that even those a football field away from an application are at risk. The EPA states in its 2016 risk assessment[1] that, in order to reduce human safety risks from drift and volatilization near an application, buffers greater than 300 feet are needed. But buffers of these widths are not currently mandated on labels, and in Oregon, farmworker housing, schools, and other farms are commonly located much closer to an application than 300 feet.

[1] U.S. Environmental Protection Agency. 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454

Chlorpyrifos in Our Food Exposes All of Us to Substantial Doses of a Neurotoxin
Chlorpyrifos is widely used and applied on a wide variety of crops, so perhaps it is not surprising that it is found in our food at dangerous levels. According to the EPA, in an average diet, Americans unknowingly consume high amounts of chlorpyifos, resulting in exposures many times levels EPA deems safe. Shockingly, children ages one to two consume chlorpyrifos in food at levels 140 times their "safe" level, according to EPA estimates.[2]

Chlorpyrifos is Harmful to Farmworkers and Their Children
While chlorpyrifos was deemed harmful enough to human health that it was banned years ago for most residential uses, those who grow our food are not protected, absorbing chlorpyrifos through the skin and inhalation as they pick and pack and tend the crops. Not only is this risky for the workers themselves – it is also bad news for the children of farmworkers.

Several "longitudinal" studies spanning two decades have allowed us to glimpse a fact that might seem amazing – when pregnant women are exposed to organophosphate pesticides like chlorpyrifos, their children suffer brain development disorders.[3] Studies have shown that of the children born to exposed mothers, infants tend to have slower reflexes,[4] toddlers exhibit autism-like disorders,[5] and seven-year-olds tested with IQs, on average, seven points behind their peers.[6]

And the children of farmworkers are often directly exposed to pesticides as well – by their proximity to the fields while living in substandard migrant housing, and by unknowingly coming into contact with the pesticide residues on the clothing or shoes of their parents when they return from the fields.

The EPA was Set to Ban Chlorpyrifos on Food Crops – Then Suddenly Reversed Itself in 2017
All of the above-listed human health consequences are well known to the EPA and were documented in its 2016 human health risk assessment. EPA proposed to ban chlorpyrifos use on food crops in 2015, then reversed itself in 2017, keeping it on the market despite its

---

[2] Ibid.

[3] See studies at https://cerch.berkeley.edu/ for CHAMACOS studies, a longitudinal birth cohort study which investigates pesticide and other environmental exposures on the health and development of children living in agricultural communities in the Salinas Valley, California. Other longitudinal studies have found similar results. See studies conducted by Columbia University at https://ccceh.org/and at the Mount Sinai Children's Environmental Health Study (https://icahn.mssm.edu/about/departments/environmental-public-health/cehc).

[4] Young. J., B. Eskanazi [and others] 2005. Association between in utero organophosphate pesticide exposure and abnormal reflexes in neonates. Neurotoxicology 26(2):199-209. https://www.ncbi.nlm.nih.gov/pubmed/15713341

5 Sagiv, S., M. Harris [and others]2018. Prenatal Organophosphate Pesticide Exposure and Traits Related to Autism Spectrum Disorders in a Population Living in Proximity to Agriculture. Environ. Health Perspect. 126(4): 047012. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6071837/

6 Bouchard MF, Chevrier J, Harley KG, Kogut K, Vedar M, Calderon N, et al. 2011. Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year- Old Children. Env. Health Perspect. 119:1189-1195. doi:10.1289/ehp.1003185

known harms. The New York Times reports that the chemical's manufacturer (Dow Chemical Company) conducted heavy lobbying prior to EPA's 2017 decision, and contributed $1 million to President Trump's inaugural committee.[7]

Chlorpyrifos is Detected in Oregon's Streams and Rivers, Sometimes at Extremely High Levels

To cap it off, chlorpyrifos also gets into our streams, threatening our already diminished salmon and steelhead. Chlorpyrifos is regularly detected in Oregon streams at levels far above its Clean Water Act standard, sometimes at levels hundreds of times higher than this safety threshold.[8] And the trend is worsening in some areas, including in the Middle Deschutes, Yamhill, and Walla Walla watersheds. Concentrations similar to those found in Willamette Valley streams have been found to:

- Kill salmon prey, such as caddisflies, mayflies, stoneflies, and daphnids.[9]
- Affect fish ability to smell and swim, both critical salmonid behaviors.[10]
- Become more toxic as water warms. At 66°F, chlorpyrifos is seven times more toxic to trout than at 55°F.[11]

The country's premier fish agency has weighed in on chlorpyrifos and its effect to threatened and endangered salmon and steelhead, with a dire warning. In 2017, the National Marine Fisheries Service determined that chlorpyrifos jeopardizes the survival and recovery of all listed salmon and steelhead in Oregon, Washington and California. Orca whales in Washington are also jeopardized by chlorpyrifos.

---

[7] Lerner, S. 2017. Protect Our Children's Brains. New York Times, February 3, 2017. https://www.nytimes.com/2017/02/03/opinion/sunday/protect-our-childrens-brains.html?_r=0

[8] See monitoring studies under Oregon's Pesticide Stewardship Partnership Program at https://www.oregon.gov/ODA/shared/Documents/Publications/PesticidesPARC/GreaterYamhillSummary.pdf and https://www.oregon.gov/ODA/shared/Documents/Publications/PesticidesPARC/ClackamasSummary.pdf

[9] U.S.EPA. 2003. Chlorpyrifos Analysis of Risks to Endangered and Threatened Salmon and Steelhead. Office of Pesticide Programs. Cited in National Marine Fisheries Service. 2008. pp. 269-271. See also National Marine Fisheries Service. 2017. Endangered Species Act Section 7 Final Biological Opinion: Environmental Protection Agency's Registration of Pesticides Containing Chlorpyrifos, Diazinon and Malathion, p. B-16.

[10] Sandahl J., Baldwin D. [and others]. 2004. Odor-evoked field potentials as indicators of sublethal neurotoxicity in juvenile coho salmon (Oncorhynchus kisutch) exposed to copper, chlorpyrifos, or esfenvalerate. Canadian Journal of Fisheries Aquatic Sciences 64:404-413. See also Sandahl J., Baldwin D. [and others]. 2005. Comparative thresholds for acetylcholinesterase inhibition and behavioral impairment in coho salmon exposed to chlorpyrifos. Environmental Toxicology and Chemistry 24:136-145.

[11] National Marine Fisheries Service. 2008. Endangered Species Act Section 7 Consultation Biological Opinion. U.S.EPA Registration of Pesticides Containing Chlorpyrifos, Diazinon, and Malathion. See pages 269-270.

Pollinators Need Protection Against Extremely Toxic Neonicotinoids as Multiple Countries Have Recognized

HB 3058 and SB 853 would also make the neonicotinoid class of insecticides "restricted use," meaning that people who don't have an Oregon license to apply pesticides wouldn't be able to buy and use these chemicals, which are widely sold in garden centers and big box stores with no education about their grim effects.

Neonicotinoids are a class of insecticides that are highly persistent and highly toxic to bees, beneficial insects and aquatic invertebrates, and highly soluble.

Numerous incidents involving bee deaths have been tied to neonicotinoids. As one result, multiple other countries and jurisdictions have banned or regulated neonicotinoids. In 2018, the European Union banned three neonicotinoids (clothianidin, imidacloprid and thiamethoxam) for all outdoor uses. Ontario has restricted the use of neonicotinoid seed treatments. And multiple cities in the United States and elsewhere have banned use of neonicotinoids on city property.

The persistence of neonicotinoids in plants results in a risk for a toxic exposure to pollinator-visiting insects long after the application. Bayer, the chemical manufacturer for imidacloprid (the most widely used neonic), found in its own studies very high residues of imidacloprid from soil applications to landscape plants, long after application.[12] An independent university study corroborated the high residue rates documented in the Bayer data, with residues ranging from 6,000-45,000 ppb in treated plants, and also documented impacts to butterflies and beneficial insect predators.[13]

These residue levels are mostly far higher than those known to cause lethal effects to honey bees (185 ppb) and illustrate the very high persistence of neonicotinoids in woody flowering plants.

Less obvious types of toxic effects ("sub-lethal" effects) from neonicotinoids can also occur. Bumblebee colonies exposed to field-realistic concentrations of imidacloprid had significantly reduced growth rates and an 85% reduction in queen production.[8] Various studies have also documented reduced bee foraging ability after very low, field realistic exposures. Sub-lethal effects can gradually result in population level effects – and the amounts at which impacts have been documented are vanishingly small. An EPA risk assessment considering the effects of a neonic (imidacloprid) identified a nectar residue level for imidacloprid of 25 ppb, above which the assessment concluded that effects on honey bee hives are likely. These effects may include reduction in numbers of pollinators as

[12] Bayer measured dogwood flowers 17 months after application containing 1,038–2,816 parts per billion (ppb) of imidacloprid. Other Bayer studies found residues of 27–850 ppb in rhododendron flowers at 6 months after application; and residues of 66–4,560 ppb in serviceberry flowers at 18 months after application. Data cited in Krischik V, M. Rogers [and others]. 2015. Soil-applied imidacloprid translocates to ornamental flowers and reduces survival of adult Coleomegilla maculata, Harmonia axyridis, and Hippodamia convergens lady beetles, and larval Danaus plexippus and Vanessa cardui butterflies. PLoS ONE 10(3): e0119133. doi:10.1371/journal.pone.0119133.

13 Krischik V., Rogers M. [and others]. 2015. (Previous footnote).

well as the amount of honey produced.[14] In addition, the EPA acknowledges "major (and statistically significant) effects" to bumblebee colonies fed imidacloprid-spiked sucrose at 10 ppb.

Requiring a License for the Most Toxic Pesticides Makes Sense

We support the move to make neonicotinoids restricted use in Oregon. Requiring a license guarantees that the person using a pesticide has had the benefit of training and can pass a test demonstrating knowledge about basic pesticide safety practices. Licensed applicators need to get continuing education to keep up with the latest science and rules. Anyone who wants to use a pesticide, especially those known to be as dangerous as neonics, should have an applicator license.

Education on Its Own Isn't Working to Limit Pesticide Impacts to Oregon Streams

Why not, some would say, take an educational approach to limiting pesticide impacts? Shouldn't that work?

Indeed, Oregon is already active with educational efforts. For example, in nine Oregon watersheds, the Oregon Pesticide Stewardship Partnership (PSP) conducts frequent water quality stream monitoring and shares the data regularly with local pesticide users to promote voluntary changes in pesticide use practices. The goal is to improve water quality, benefitting human health and aquatic life.

The PSP program saw early marked success, lowering the frequency of detections of pesticides like malathion and diuron in east-side watersheds. However, in recent years, and especially in west-side agricultural basins, progress in reducing pesticide residues in streams has been limited.

According to the PSP's 2015-2017 biennial summary in Yamhill County, monitoring data reveals a significant uptick in the number of pesticide detections that exceeded benchmark concentrations (i.e. levels considered safe). According to the PSP's internal report:

Especially challenging has been achieving reductions in areas where agricultural land use is diversified. While there has been some progress made in reducing the frequency of detections, the significant increase in benchmark exceedances and the number of pesticides detected indicate limited success in the effectiveness, thus far, of management measures implemented.

Chlorpyrifos is one of the pesticides regularly detected above benchmarks. For example, in Yamhill and Clackamas subbasins between 2015-2017, chlorpyrifos was present in 11 and 14% of samples, respectively, with some samples containing concentrations thousands of times above the benchmark "safe" level. [15]

Imidacloprid, one of the neonicotinoid insecticides that would go to "restricted-use" status under the bill, was present in 20 and 33% of the samples in these two basins, respectively, with the average concentration in the Clackamas basin double the benchmark safe level, and

---

14 Environmental Protection Agency. 2016. Preliminary Pollinator Assessment to Support the Registration Review of Imidacloprid. https://www.regulations.gov/ #!documentDetail;D=EPA-HQ-OPP-2008-0844-0140.

[15] See Footnote 8.

again, some samples containing concentrations thousands of times above the benchmark "safe" level.

Education for Farmworkers Has been Strengthened but It will Take Years to Know if It Has Substantially Reduced the Hazards for These Vital Workers

In 2015, the EPA adopted strengthened rules designed to enhance worker protection. In 2017, the EPA, led by Scott Pruitt, tried to reverse some of the protections under these rules. While this effort at reversal was ultimately unsuccessful, the attempt to weaken the rules resulted in delays and widespread confusion. Even if fully implemented, it will take years to know if the new protections will substantially reduce the hazard associated with farm work and accompanying pesticide exposure.

Farmers Adapt and Lead the Way

Some ask, won't farmers will be hurt badly if we withdraw these chemicals from their toolbox? We recognize that it can be difficult for farmers when a pesticide is removed from their arsenal. But, if banned, chlorpyrifos would be far from the only pesticide ever withdrawn from the market due to safety hazards. DDT and many other pesticides once considered indispensable have been cancelled over the years as their safety risks became better understood - and farms have survived.

Farmers are already working together to share information about safer practices, leading the way. For example, in Oregon's nursery industry, educational efforts by Oregon State University Extension and leadership by growers and insectaries has greatly expanded the number of growers using biological control to manage insect pests. Many growers already recognize that harsh, broad-spectrum pesticides like chlorpyrifos and neonicotinoids result in resistance – the bugs evolve a tolerance to the pesticide and come back even stronger. As a result, many growers (who are not organic) are recognizing that it is their long-term best interest to move to more sustainable pest management practices.

Safe Alternative Strategies Exist to Reduce Insect Pressure in Many Crops

Many growers already utilize safe, alternative strategies to reduce insect pressure and our extension services continue to work to develop new methods. Some methods that work include:

- Planting pest-resistant cultivars when available.
- Preventing or suppressing pests with cultural strategies to make the area less hospitable to the pest. For example, delaying planting dates can inhibit pests such as flea beetles and cabbage maggots. Certain crop rotations interrupt the life cycle for corn rootworm, wireworms, Colorado potato beetle, and symphylans.[16] Removing known alternate hosts reduces pest resources.

---

[16] Stoner, K. 2009. Management of insect pests with crop rotation and eld layout. http://www.sare.org/Learning-Center/Books/Crop-Rotation-on-Organic-Farms/Text-Version/Physical-and-Biological-Processes-In-Crop-Production/Management-of-Insect-Pests-with-Crop-Rotation-and-Field-Layout. Also see Umble J. [and others]. 2006. Symphylans: Soil Pest Management Options. https://attra.ncat.org/attra-pub/viewhtml.php?id=127ATTRA.

- Pheromones (chemicals produced by an insect to communicate) are used in many crops for mass trapping or mating disruption, suppressing insect populations. Mating disruption for codling moth is currently used on 90% of the apple and pears grown in Washington State and is an increasingly used option in Oregon crops like hazelnuts.
- Using exclusion or barrier techniques.
- Supporting biological pest control by natural enemies (predators or parasites on the pest). Many biocontrols can be purchased from commercial providers. Conserving or creating on-farm or garden habitats (such as beetle banks, cover crops, alley cover crops or hedgerows) also supports native natural enemies (conservation biocontrol).[17] Such habitats also provide habitat for native pollinators, important to many Oregon crops.
- Mass-trapping pests using trap crops, pheromone technology or baits. Mass-trapping with the aid of a pheromone was found to significantly reduce western flower thrip in strawberries.[18] In Washington and Idaho, trap crop designs including mustard, rape, and pak choi were found to reduce populations of flea beetles on broccoli more effectively than trap crops with only one species.[19]

Conclusion
We recognize that these are difficult decisions. We know that legislators are reluctant to take tools out of farmers' hands. But in this case, the risk of leaving things as they are is too great. We urge you to please support these bills, which will protect Oregon children, farm workers, farmers, and fish.

Thank you for the opportunity to express our support for this bill.

Sharon Selvaggio
Northwest Center for Alternatives to Pesticides

Rhett Lawrence
Sierra Club, Oregon Chapter

Nina Bell
Northwest Environmental Advocates

Mark Sherwood
Native Fish Society

---

[17] Mader, E., J. Hopwood [and others]. 2014. Farming with native beneficial insects.The Xerces Society: Storey Publishing.

[18] Sampson C, and W. Kirk. 2013. Can mass trapping reduce thrips damage and is it economically viable? Management of the Western ower thrips in strawberry. PLoS ONE 8(11): e80787. https://doi.org/10.1371/journal.pone.0080787.

[19] Parker, J., D. Crowder [and others]. 2016.Trap crop diversity enhances crop yield.Agriculture, Ecosystems and Environment 232:254-262. http://entomology.wsu.edu/david-crowder/ les/2016/09/2016_parker-et-al_ag-ecosyst-environ.pdf.

OREGON ORGANIC COALITION

March 24, 2019

To: House Committee On Agriculture and Land Use
ATTN: Chair Representative Brian Clem, Vice-Chair Representative Susan McLain, and Members of the Committee
Re: Written testimony HB 3058
The Oregon Organic Coalition, and our represented members, supports HB 3058 and urges the House Committee and our elected Representatives, to pass this bill out of committee.

Oregon Organic Coalition supports HB 3058, banning the use of chlorpyrifos, a toxic nerve agent pesticide proven to cause brain damage in children, contaminate waterways and harm wildlife. This bill would also restrict the use of bee-killing neonicotinoids to licensed professionals only, thus removing them from store shelves.

After years of study, the U.S. Environmental Protection Agency concluded that **chlorpyrifos is *unsafe at any detectable level*** and was set to ban it in 2017. Unfortunately, the Trump Administration reversed that decision and the issue remains tied up in the courts. Oregon can better.

We are coordinating a strong coalition of organizations and businesses to support this bill addressing the harms caused by two pesticides that are the target of restrictions in other states and countries around the world. Members of the Oregon Organic Coalition recognize the importance of protecting Oregonians, our agricultural lands, the pristine environment for which Oregon is known and loved, and the health of the public from the negative impacts that these two pesticides have on all these incredible resources.

The Oregon bills will **ban the use of chlorpyrifos**, a toxic nerve agent pesticide proven to cause brain damage in children, contaminate waterways and harm wildlife. The bills will also **restrict the use of bee-killing neonicotinoids** to licensed professionals only, thus removing them from store shelves in grocery, hardware and garden stores. Neonicotinoids have been associated with worsening declines of bees and other pollinators. Neonicotinoids also harm fish, birds and soil organisms. The European Union and states including Maryland and Connecticut have banned or restricted neonicotinoids.

HB 3058 would provide much needed protections to Oregon's children, farm workers and wildlife.

I wish these comments to be submitted as testimony for public hearing.

Stacy Ann Kraker,

President, Oregon Organic Coalition

The Oregon Organic Coalition (OOC) is a trade support organization, working to advance the development and growth of the organic industry and community in Oregon. The OOC represents volunteer stakeholders--farmers, wholesalers, processors, organic certifiers, scientists, consumers and retailers. We lead promotional activities and advocate for state policy to support and grow Oregon's organic trade.

HB 3058

A growing body of scientific study shows threats from several commonly used pesticides to human health, water quality, aquatic species, pollinators, and the biodiversity upon which we all depend.[i] While ensuring state agencies are upholding their responsibility to protect the public, we must pursue common sense solutions that also protect responsible businesses, farmers, schools, and workers.

Neonicotinoids

Neonicotinoids ("neonics") are a class of synthetically created neurotoxic pesticides widely used for domestic pest control and on a broad range of food, energy, and ornamental crops. They are highly toxic to insects, pollinators, and freshwater invertebrates, posing threats to water quality, fish, and birds. Neonics are highly persistent in soils, wildflowers, streams and lakes.[ii] After 242 scientists from around the world cited an "immediate need for national and international agreements to greatly restrict their use", the European Union recently banned the outdoor use of three neonics.[iii] Oregon currently requires certification and training in order to buy, sell, or disseminate over 500 restricted use pesticides, yet none of the neonics are included on the list. HB 3058 would add neonics to the list of restricted use pesticides.

Chlorpyrifos

Chlorpyrifos is a widely used organophosphate insecticide tied to development disorders in children that is harmful for humans to touch, inhale or eat.[iv] It acts as a nerve agent, attacking chemical pathways in the body creating a breakdown in the ability of nerves to communicate and function.[v] The United States Environmental Protection Agency under Scott Pruitt recently refused to finalize a court ordered national ban on Chlorpyrifos, necessitating action at the state level.[vi] To protect the health of farmworkers, to safeguard our food supply, and to protect our environment, we urge Oregon to join Hawaii in passing the statewide ban on Chlorpyrifos found in HB 3058.

---

[i] The Xerces Society. "Scientists Urge Action to Protect Waters from Neonicotinoid Insecticides". 3/13/18. Lipton, Eric. *New York Times*. "Court Orders E.P.A. to Ban Chlorpyrifos, Pesticide Tied to Children's Health Problems". 8/9/18.
[ii] Goulson, Dave and 232 Signatories. *Science Magazine*. "Neonicotinoids: An open letter to policy makers and regulators". 6/1/18
[iii] Butler, Declan. *Nature*. "Scientists hail European ban on bee-harming pesticides". 4/27/18.
[iv] National Pesticide Information Center. Chlorpyrifos General Fact Sheet. 4/10.
[v] Cuthbert, Lori. *National Geographic*. "EPA Must Ban Dangerous Insecticide". 8/10/2018
[vi] National Resources Defense Council. "Hawaii Bans Use of Toxic Pesticide Chlorpyrifos" 6/13/18.

From: Steven VanGrunsven
To: Rep Clem; Rep McLain; Rep Post; Rep BoshartDavis; Rep Helm; Rep Smith D; Rep Williams; Exhibits HAGLU
Subject: Please Stop HB3058
Date: Tuesday, March 26, 2019 8:27:37 AM
Attachments: image001.png

Dear Legislators,

Please stop this unnecessary piece of legislation. It is the job of the Oregon Department of Agriculture (ODA) to regulate the pesticides that are used in our state. These decisions take many days and weeks to weigh all of the information involved.

Pesticides to a farmer are like wrenches to a mechanic. If you remove the best tool for the job it is harder to get it done and it may not get done right. This is why the ODA thinks long and hard before removing or adding pesticides available to farmers.

I grow sugar beets for seed which is a very important crop in our valley. This seed has an extremely low threshold for pests. Chlorpyrifos is the only insecticide that controls the seed weevil. This pest is extremely detrimental to the crop quality and yield. We are working with newer insecticide technology but these haven't proven to be effective.

Neonicotinoid insecticides are widely used as seed treatments. This is the safest way to control early season pests. Under the current rules when planting a seed with a restricted use seed treatment the person planting the seed would need to be a licensed pesticide applicator.

Neonicotinoids are widely used by homeowners and pet owners to control many pests like fleas and ticks. This would eliminate numerous pet health products and systemic insect control for the yard and garden.

When used according to the label these products are extremely safe. The problems arise when the applicator fails to read the label or refuses to follow the directions. We already have laws that require the applicator to follow the label.

Chlorpyrifos and neonicotinoid insecticides are integral components of Integrated Pest Management programs and Insect Resistance Management programs. Use of IPM cropping systems and preventing pest resistance can lead to more sustainable agriculture and reduced farming costs, allowing farmers to minimize production costs while supporting a sustainable food supply.

Thanks,

Steve VanGrunsven, Agronomist
Valley Agronomics LLC
986 N Holladay | Cornelius, OR 97113
Cell 503.781.2251 | Fax 503.359.3582
Steven.vangrunsven@valleyag.com | www.wilco.coop

CERTIFIED
CROP ADVISER

American Society of Agronomy

Sybil Hebb
Director of Policy Advocacy
522 SW Fifth Ave.
Suite 812
Portland, OR 97204
P: 503.936.8959 (cell)
shebb@oregonlawcenter.org

Testimony Supporting HB 3058
House Agriculture & Land Use Committee
March 26th, 2019

Chair Clem, Vice-Chairs McLain and Post and Members of the Committee,

I submit this testimony on behalf of the Oregon Law Center (OLC) in support of HB 3058, which would ban the use of chlorpyrifos and classify neonicotinoid pesticides as "restricted use."

The Oregon Law Center (OLC) is a non-profit law firm whose mission is to achieve justice for the low-income communities of Oregon by providing a full range of the highest quality civil legal services. OLC has over forty years of experience in providing legal services to Oregon's farmworkers on issues such as unpaid wages, labor housing conditions and workplace health and safety concerns. Just like employees in other sectors, these laborers work hard to earn a decent living and provide basic necessities for their families. Our clients who work in or near fields also work hard to keep themselves and their families safe and free from pesticide contamination.

We visit farmworkers and their families where they live when they are not working. Our staff report that one of the most striking impressions as we are asked into farmworker living spaces is the strong scent of bleach or Tide. Even after a long day in the field, families work hard to keep their clothes, floor, and counters free of pesticide residue, soil and possible chemical contaminants. The second thing that one may notice is that there is not a distinct inside or outside space for most labor housing occupants. They often do not have indoor plumbing so that their sinks, potable water spigots, toilets and even stoves are outside the cabins. The clothing hangs to dry outside on fences or lines, and the children use the parking space on soil near the fields and the cabins. The housing is often enveloped inside the orchard or fields within less than one hundred feet and often much closer to the row crops or trees treated.

Farmworkers are increasingly aware of the dangers of pesticides. Whether the training about how to protect oneself against pesticides is provided by the employer or from an organization like ours, farmworkers wish to learn and use it. We know this first-hand because for thirteen years, our organization led a nationally funded project focused on the needs of indigenous farmworkers (who do not speak Spanish but instead one of the indigenous languages of Mexico or Central America as their primary language) when it comes to health and safety. Due to language and cultural barriers, these farmworkers are some of the most isolated farmworker populations. Through the work of this project, together with other community organizations, universities, health clinics, and indigenous farmworkers themselves, we learned that one of the top priorities for farmworkers is concerns about pesticide exposure and how it may affect their families. We learned that there was no information in any form available in indigenous languages on such training for our clients, so the team focused on creating training materials. The project's work was successful and we produced a video in five indigenous languages and Spanish, along with animations and a *promotores* (peer educator) program on the newly adopted Federal Worker Protection Standards and its state counterpart. In creating the programs and sharing them with health clinics, housing providers, migrant education programs, and farmers, we have shared what we learned. Through peer-reviewed journals we have opened the discussion among public health advocates about an often overlooked population working in the fields with inadequate opportunity to learn the materials that maybe offered in English or Spanish.

Even through language barriers and limited time windows in complicated lives, our clients have worked hard to try to learn how to reduce exposure and try to keep their families safe. However, nothing they can do will fully resolve the fact that under current law, their children and families may continuously be exposed to chlorpyrifos in the fields and near their homes. As other testimony submissions have pointed out, the most recent Human Health Risk Assessment for chlorpyrifos from the EPA has recently found that there are no safe levels of the pesticide in food or water, and that unsafe exposures to farmworkers continue to occur on average 18 days after the applications (note that worker re-entry regulations are only 5 days). [1] The well-documented dangers of this pesticide have led to the banning of its use in non-farm residential settings since 2001. Farmworker families currently bear a risk that other families do not, to their significant detriment.

We appreciate that all stakeholders have concerns about the safety of farmworkers and rural residents, and know that these issues are not taken lightly. However, the dangers to our clients and their children from the use of chlorpyrifos cannot be sufficiently mitigated to justify their continued use. Some have suggested that the state should not act, and instead leave these decisions to the federal government. Oregon should not wait to act: the risks to families and children are too great. On behalf of our clients, we urge support of HB 3058.

Thank you for the opportunity to submit testimony.

---

[1] US Environmental Protection Agency. Chlorpyrifos:Revised Human Health Risk Assessment for Registration Review at 36-37. Health Effects Division, Office of Pesticide Programs at 36-37 (November 3,2016). http://www.epa.gov/ingredients-used-pesticides-products/revised-human-health-risk-assessment-chlorpyrifos

From:	Ted Hake
To:	Exhibits HAGLU
Subject:	Neonics and chlorpryifos
Date:	Tuesday, March 26, 2019 11:44:40 AM

Placing neonics in the RUP category is a good idea, especially since I believe the problems have been caused by applicators lacking proper training.

However, banning PPI applications of chlorpryifos is very short sighted. Oregon growers currently have no effective, labeled alternatives for all their crops. Without chlorpryifos they will have no other options for control of some soil insects for their high value vegetable seed crops.

Sincerely,

Ted Hake
Research Director SSGWO
Ted@HakeAgConsulting.com
503-507-7994

Testimony by City of Wilsonville Mayor Tim Knapp Supporting HB 3058:

Proposed Legislation Stops Use of a Toxic Pesticide, Restricts Use of Neonicotinoid Pesticides Shown to Be Harmful to Pollinators

Scheduled for public hearing on March 26, 2019, before the House Committee on Agriculture and Land Use

Chair Clem, Vice-Chairs McLain and Post, and Members of the Committee:

On behalf of the City of Wilsonville City Council, I am testifying in support of HB 3058, which requires the Oregon Department of Agriculture to remove from use chlorpyrifos, a highly toxic pesticide with substantial environmental and health impacts, and to classify neonicotinoids as restricted-use pesticides.

In 2017, the National Marine Fisheries Service determined that chlorpyrifos jeopardizes the survival and recovery of all species of salmon and steelhead listed as endangered in Oregon, Washington and California. In 2018 the California Department of Pesticide Regulation released a scientific assessment that concluded that chlorpyrifos should be listed as a toxic air contaminant based on evidence of its neurological effects and exposure risks. Recognizing the harmful impacts, the U.S. Environmental Protection Agency (EPA) was reportedly ready to ban this insecticide in 2017, but suddenly changed course in 2018. Subsequently, a federal court ordered the EPA to ban the use of chlorpyrifos; however, the EPA appealed that ruling, which is scheduled for a hearing this month.

Wilsonville was the site in June 2013 of reportedly the largest pollinator bumble bee-kill in the history of the United States—a distinction that our community does not relish—due to the application of neonicotinoid pesticides by trained professional applicators. This powerful class of pesticides has been shown conclusively to harm pollinators throughout the life-cycle of the product, with detrimental effects continuing long after initial treatment since plants take-up the pesticide into their tissues.

The environmental impact of neonicotinoids has come under increasing scrutiny worldwide. In 2014, the European Union banned the use of three types of neonicotinoid pesticides in crops that attract bees. While HB 3058 does not ban the use of neonicotinoids, placing restrictions on the use of this powerful class of pesticides can reduce chances of bee kills.

Many local, Wilsonville-area farming and nursery businesses are dependent upon pollinator health for propagation of key nut, fruit and vegetable crops. Pacific Natural Foods, a major national organic food-processor with substantial employment and operations in Tualatin and Wilsonville, is dependent on healthy populations of pollinators for successfully farming over 1,000 acres in the Willamette Valley.

The Department of Agriculture found that four separate bumble bee-kill incidents in 2013 and three separate bee-kill incidents in 2014 were due to applications of neonicotinoid pesticides.
The City notes that each of these pollinator-killing incidents was brought about by the use of neonicotinoid insecticides by duly licensed pesticide applicators — technicians trained in correct pesticide application who readily used the pesticides since their use was not restricted sufficiently.

The City of Wilsonville respectfully urges a DO PASS vote on HB 3058. Thank you.

Sincerely,

Tim Knapp

Tim Knapp, Mayor
City of Wilsonville

From:	Tom Humphrey
To:	Exhibits HAGLU
Subject:	House bill 3058
Date:	Tuesday, March 26, 2019 1:08:35 PM

If Portland, Maine can do it, can’t Portland and Oregon? Please, for the sake of all of our children, and all of our beloved and wild animals, and all of our food and water, please vote for house bill 3058.

Chlorpyrifos and neonicotinoids are harmful to our community, likely in more ways then we know. Lead the way and make us proud. Thank you.

Tom Humphrey
2545 SE 80th Ave
Portland, OR 97206
503-545-8924

EARTHJUSTICE

Testimony in Support of HB 3058
Prohibits sale, purchase or use of the pesticide chlorpyrifos.

Committee on Agriculture and Land Use
Oregon House of Representatives
March 26, 2019

Chairman Clem and Members of the Committee,

Thank you for the opportunity to testify. My name is Tyler Smith. I am a staff scientist at Earthjustice, the largest nonprofit, environmental law organization in the country. Earthjustice strongly supports **HB 3058**, which would prohibit the use of chlorpyrifos in Oregon.

EPA Proposed Banning Chlorpyrifos

In 2015, EPA concluded that using chlorpyrifos on food does not meet the federal safety standard of a "reasonable certainty of no harm" and proposed a ban.[1] This ban would have eliminated nearly all uses of this pesticide across the country.

EPA's conclusion is consistent with decades of scientific research. Indeed, almost 20 years ago, EPA banned residential uses of chlorpyrifos because studies indicated harm to children.[2] But at that time, EPA allowed the continued use of chlorpyrifos on our food and for other applications, such as pest control on turf grass at golf courses.

Now, after years of further study, EPA's scientists have concluded that there is no safe use of chlorpyrifos.[3] They reviewed thousands of studies and examined the hundreds of ways that chlorpyrifos may be used under current law. They found that all of these uses result in unsafe levels of exposure — even when handlers follow directions on pesticide labels and wear personal protective equipment.[4]

In addition to finding that exposure to pesticide handlers was unsafe, EPA's scientists also found that the continued use of chlorpyrifos on food can harm those who eat the food. The uses on food expose infants to 93 times what the agency considers safe and expose children 1 to 2

NORTHEAST 48 WALL STREET, 19TH FLOOR NEW YORK, NY 10005
T: 212.845.7376 F: 212.918.1556 NEOFFICE@EARTHJUSTICE.ORG WWW.EARTHJUSTICE.ORG

years of age to 140 times what the agency considers safe.[5] Moreover, according to agency, there is no safe level of chlorpyrifos in drinking water.[6]

EPA's Proposal to Ban Chlorpyrifos Followed a Rigorous Process

EPA's conclusions followed years of careful study. The evidence that exposure to chlorpyrifos harms children[7] was reviewed again and again by EPA's scientists and by independent experts who serve on the agency's Scientific Advisory Panel. The agency and the Panel found that the weight of the evidence — that is, the best available science weighed and judged by experts — supports the conclusion that chlorpyrifos is a neuro-developmental toxicant. Specifically:

- In 2012, the Panel concluded that epidemiologic and animal studies "suggest that chlorpyrifos can affect neurodevelopment at levels lower than those associated with" acute poisoning.[8]

- In 2016, the Panel stated, "The Panel agrees that both epidemiology and toxicology studies suggest there is evidence for adverse health outcomes associated with chlorpyrifos exposures below levels that result in" acute poisoning.[9]

- In 2016, EPA wrote, "The agency agrees with the 2016 [Panel] (and previous [Panels]) that there is a potential for neurodevelopmental effects associated with chlorpyrifos exposure to occur at levels below" those associated with acute poisoning.[10]

In short, even low levels of exposure to chlorpyrifos can harm the developing brain.

The Panel praised a study of chlorpyrifos exposure in children conducted by scientists at Columbia University. The Panel stated, "the Columbia study is the most robust and appropriate for informing risk assessment", "the Columbia study is epidemiologically sound", and "the Columbia study was indeed quite strong and provided extremely valuable information."[11]

The Panel also concluded that the results of the Columbia study were generally consistent with those reached by other scientists across the country. The Panel stated that, overall, epidemiologic studies have found "consistent associations relating exposure measures to abnormal reflexes in the newborn, pervasive development disorder at 24 or 36 months, mental development at 7-9 years, and attention and behavior problems at 3 and 5 years of age."[12]

Yet, despite these studies and the conclusions of experts, in March 2017, the Trump administration announced that it would not finalize the proposed ban.[13] The administration did not present any new scientific evidence. It disregarded the best available science and left millions of people exposed to a toxic chemical.

Any Possible Federal Action to Ban Chlorpyrifos Has Been, and Likely Will Continue to be, Delayed by Litigation

A coalition of environmental, health, labor, and civil rights organizations has sued the Trump administration, challenging its refusal to ban chlorpyrifos.[14] In August of last year, a federal appeals court ordered the administration to ban all uses of chlorpyrifos, but the agency appealed further.[15] The Ninth Circuit will hear oral argument in the case today.

To date, EPA still has not disputed the conclusion reached by its scientists and instead has based its legal argument on unrelated procedural issues. As the court observed in August, "The EPA presents no arguments in defense of its decision. Accordingly, the EPA has forfeited any merits-based argument."[16]

There simply is no debate about the science of chlorpyrifos — except from the people who make money off chlorpyrifos. But unless Oregon takes action, chlorpyrifos will remain on the market and people here will remain exposed while the federal litigation continues. Given the options available to the Trump administration, it may take years to resolve all of the potential litigation even if the plaintiffs ultimately prevail.

Oregon Should Ban Chlorpyrifos Now

Frankly, the three of us should not be here today. In 2015, EPA concluded that chlorpyrifos did not meet the federal safety standard and proposed to ban this toxic pesticide. The agency should have finalized the proposed ban, and that should have been the end of it.

Politics, pure and simple, stands in the way. It is only because the Trump administration has abandoned science and abdicated its responsibility to public health that Oregon and other states now must consider bills to prohibit the use of chlorpyrifos. But Oregon *should* take action.

HB 3058 would prohibit the use of chlorpyrifos and make this state a safer place for kids to live. I urge your support and am happy to answer your questions. Thank you.

References

---

[1] EPA wrote, "At this time, the agency is unable to conclude that the risk from aggregate exposure from the use of chlorpyrifos meets the safety standard of [a "reasonable certainty of no harm" contained in] section 408(b)(2) of the Federal Food, Drug, and Cosmetic Act (FFDCA). Accordingly, EPA is proposing to revoke all tolerances for chlorpyrifos." Chlorpyrifos; Tolerance Revocations, 80 Fed. Reg. 69,080 (November 6, 2015), https://www.federalregister.gov/documents/2015/11/06/2015-28083/chlorpyrifos-tolerance-revocations.

[2] As EPA explained, "This action comes after completing the most extensive scientific review of the potential hazards from a pesticide ever conducted. This action -- the result of an agreement with the manufacturers -- will significantly minimize potential health risks from exposure to Dursban, also called chlorpyrifos, for all Americans, especially children." EPA, Dursban Announcement (2000), https://archive.epa.gov/epa/aboutepa/dursban-announcement.html.

[3] EPA wrote, "[A]ll agricultural occupational handler scenarios, all primary seed treatment handler scenarios, and all secondary seed treatment (planter) scenarios are of concern with label-specified and maximum levels of personal protective equipment (PPE) or engineering controls[.]" EPA, Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review 7 (2016), https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454.

[4] *Id*.

[5] *Id*. at 23.

[6] *Id*. at 24.

[7] For recent reviews of the evidence that chlorpyrifos harms children, *see* Irva Hertz-Picciotto, Jennifer B. Sass, Stephanie Engel, *et al*., Organophosphate Exposures During Pregnancy and Child Neurodevelopment: Recommendations for Essential Policy Reforms, 15 *PLoS Medicine* e1002671 (2018), https://journals.plos.org/plosmedicine/article/file?id=10.1371/journal.pmed.1002671&type=printable; Maria Teresa Munoz-Quezada, Boris A. Lucero, Dana B. Barr, *et al*., Neurodevelopmental Effects in Children Associated with Exposure to Organophosphate Pesticides: A Systematic Review, 39 *NeuroToxicology* 158 (2013), https://www.sciencedirect.com/science/article/pii/S0161813X13001514.

[8] EPA, Transmittal of Meeting Minutes of the FIFRA Scientific Advisory Panel Meeting held April 10-12, 2012 on "Chlorpyrifos Health Effects" 53 (2012), https://www.epa.gov/sites/production/files/2015-06/documents/041012minutes.pdf.

[9] EPA, Transmittal of Meeting Minutes of the April 19-21, 2016 FIFRA SAP Meeting Held to Consider and Review Scientific Issues Associated with "Chlorpyrifos: Analysis of Biomonitoring Data" 18 (2016), https://www.epa.gov/sites/production/files/2015-06/documents/041012minutes.pdf.

[10] Chlorpyrifos; Tolerance Revocations; Notice of Data Availability and Request for Comment, 81 Fed. Reg. 81,049, 81,050 (November 17, 2016), https://www.federalregister.gov/documents/2016/11/17/2016-27552/chlorpyrifos-tolerance-revocations-notice-of-data-availability-and-request-for-comment.

[11] EPA, Transmittal of Meeting Minutes of the FIFRA Scientific Advisory Panel Meeting Held September 16-18, 2008 on the Agency's Evaluation of the Toxicity Profile of Chlorpyrifos 31, 32, 35 (2012), https://www.regulations.gov/document?D=EPA-HQ-OPP-2008-0274-0064.

[12] EPA, *supra* note 8 at 17.

[13] Eric Lipton, "E.P.A. Chief, Rejecting Agency's Science, Chooses Not to Ban Insecticide," *The New York Times* (March 29, 2017), https://www.nytimes.com/2017/03/29/us/politics/epa-insecticide-chlorpyrifos.html.

[14] The organizations are: Pineros y Campesinos Unidos del Noroeste, League of United Latin American Citizens, United Farm Workers, Farmworker Association of Florida, Labor Council for Latin American Advancement, Farmworker Justice, GreenLatinos, National Hispanic Medical Association, Learning Disability Association of America, California Rural Legal Assistance Foundation, Pesticide Action Network North America, and Natural Resources Defense Council. For more information, *see* Earthjustice, Groups Appeal EPA's Refusal to Ban Dangerous Pesticide (June 6, 2017), https://earthjustice.org/news/press/2017/groups-appeal-epa-s-refusal-to-ban-dangerous-pesticide.

[15] League of United Latin American Citizens et al. v. Wheeler (2018), https://earthjustice.org/sites/default/files/files/chlorpyrifos%20opinion%208.9.2018.pdf.

[16] *Id*. at 30.

March 25, 2019

Oregon House Committee on Agriculture and Land Use
900 Court St. NE
Salem Oregon 97301

RE: Oregon HB 3058—A bill to prohibit the use of chlorpyrifos and restrict the use of neonicotinoids

Dear Honorable Members of the House Committee on Agriculture and Land Use,

Migrant Clinicians Network and Farmworker Justice urge you to support HB 3058 to prohibit the use of chlorpyrifos and restrict the use of neonicotinoids in Oregon. Both Migrant Clinicians Network and Farmworker Justice are national non-profit organizations. MCN is dedicated to health justice for the mobile poor and provides extensive training and technical assistance to clinicians across the country. Our work includes several national programs funded by the US Environmental Protection Agency (EPA) to prepare health clinics and providers to respond appropriately to pesticide poisonings, to further help them understand the long-term effects of pesticides and to help them prevent pesticide illness. Farmworker Justice seeks to empower farmworkers to improve their living and working conditions, including their occupational health.

We urge you to support HB 3058 to ban chlorpyrifos use in Oregon. Please consider the impact of this chemical on the health of citizens in Oregon, particularly those who are most vulnerable and most exposed. EPA banned the use of chlorpyrifos in residential settings in 2000 due to emerging evidence that it posed unacceptable neurodevelopmental risks to young children. However, <u>the agency allowed continued use of the pesticide in agriculture, resulting in exposure to the children of farmworkers and other rural residents</u>. Farmworkers are historically one of the most economically disadvantaged labor groups in the country because they work long days, perform hazardous work and receive low ages all while being routinely exposed to high levels of pesticides in the fields where they work and in the communities where they live. Exposure to pesticides causes farmworkers to suffer more chemical-related injuries and illnesses than any other workforce in the nation. Most of these workers are particularly vulnerable to environmental and occupational health hazards because they have no health insurance, and limited access to health care. Since EPA banned chlorpyrifos for home use in 2000, farmworkers and their children have been exposed to chlorpyrifos through airborne drift, water contamination, and even the residues on their parents' work clothes.

The extensive epidemiologic research that confirms serious, permanent neurodevelopmental effects of very low doses of chlorpyrifos exposure in utero or during childhood is described elsewhere in more detail. Farmworkers and their families in Oregon cannot be adequately protected from these outcomes unless there is a ban on the use of chlorpyrifos.

In Oregon, chlorpyrifos is used in crops including strawberries, apples, hazelnuts, corn and other vegetables, as well as Christmas trees and nursery plants. Farmworkers in Oregon are exposed to chlorpyrifos when they mix or apply the chemical, when they work near an area where chlorpyrifos spraying takes place and are contaminated by drift, or when they enter a field that has previously been sprayed and has residual chemical exposure. Farmworkers exposed at work transport pesticides on their work clothing, shoes, hair and skin into family vehicles and their homes. In addition, farmworker families live in camps near the fields where they work or in substandard dwellings. In these environments, they experience exposure to chlorpyrifos frequently. In all of these settings, farmworkers are absorbing chlorpyrifos through the skin, through the lungs, and through the gut.

In its most recent Human Health Risk Assessment for chlorpyrifos, EPA found that there are no safe levels of the pesticide in food or water, that unsafe exposures to farmworkers continues to occur on average *18 days after applications* (despite worker re-entry times no longer than 5 days) and that workers who mix and apply chlorpyrifos are exposed to unsafe levels even when using protective gear and engineering controls.[1]

The most immediate concern of exposure to chlorpyrifos is for the pregnant farmworkers. It is not possible to reduce the level of exposure below the threshold for damaging the fetus. Personal protective equipment is not 100% effective and contributes to the workers' heat burden, which itself can be dangerous. Similarly, field sanitation provisions for handwashing are simply not adequate to reduce the levels of exposure below those known to cause harm. The water provided to workers to prevent heat illness is yet another source of contamination at these low levels.

Farmworkers experience chronic and acute exposure to chlorpyrifos. In the past two years, MCN has helped physicians and other healthcare providers respond to two acute worker poisoning outbreaks from chlorpyrifos. Poisoned workers suffered from dizziness, nausea, vomiting and they are being monitored for the long-term effects from these incidents. The majority of the workers in both outbreaks were not even working directly with chlorpyrifos.

---

[1] US Environmental Protection Agency. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review at 36-7. Health Effects Division, Office of Pesticide Programs at 36-7 (November 3, 2016). https://www.epa.gov/ingredients-used-pesticide-products/revised-human-health-risk-assessment-chlorpyrifos

Unbeknownst to the workers in both outbreaks, chlorpyrifos had been sprayed on a nearby field and drifted onto the workers, causing acute poisonings. In 2014, Raynor and others published a report of 371 migrant farmworkers in North Carolina who were found to have levels of urinary chlorpyrifos metabolites (among other pesticides) that were an order of magnitude greater than those found in the US population as a whole.[2]

Chlorpyrifos does not discriminate between farmworker families and farmer families when it comes to exposure routes, and family impact may not be limited to children. A 2017 paper published from the Agricultural Health Study has identified a borderline but statistically significant increased risk for pre-menopausal breast cancer among women who reported using chlorpyrifos, consistent with its known effects as an endocrine disrupting chemical.[3]

MCN and Farmworker Justice urge the committee to issue a favorable report on HB 3058 that is critically needed to protect Oregon farmer and farmworker families.

Sincerely,

Virginia Ruiz, JD, Director of Occupational and Environmental Health, Farmworker Justice

Amy K. Liebman, MPA, MA, Director of Environmental and Occupational Health, Migrant Clinicians Network

Eva Galvez, MD, Hillsboro, OR

---

[2] Raymer JH, Studabaker WB, Gardner M, Talton J, Quandt SA, Chen H, Michael LC, McCombs M, Arcury TA. Pesticide exposures to migrant farmworkers in Eastern NC: detection of metabolites in farmworker urine associated with housing violations and camp characteristics. Am J Ind Med. 2014 Mar;57(3):323-37. doi: 10.1002/ajim.22284. Epub 2013 Nov 25.

[3] Engel LS, Werder E, Satagopan J, Blair A, Hoppin JA, Koutros S, Lerro CC, Sandler DP, Alavanja MC, Beane Freeman LE. Insecticide Use and Breast Cancer Risk among Farmers' Wives in the Agricultural Health Study. Environ Health Perspect. 2017 Sep 6;125(9):097002. doi: 10.1289/EHP1295.

The Board of Directors
Women Leaders in Cannabis
Eugene, Oregon 501 (c) 6
March 19, 2019

We, the Board of Directors for Women Leaders in Cannabis,
are passionately committed to campaigning for "Organic Land Care" through the Non-Toxic Oregon platform of Beyond Toxics. We are pioneering an industry heavily regulated towards ensuring the health and safety of people and the environment. We feel it is incredibly incongruous that current land management laws allow the use of toxic chemicals in public space while the Cannabis industry was asked to implement, within one season, the most heavily regulated pesticide-use program of any agricultural crop or landscape management program. (OAR 845-025-2070 referencing accordance with ORS 634 and OAR 603-057)

Currently, it is legitimately safer to smell a Cannabis flower in Oregon, than a rose growing in a city park. Oregon law ensures that the Cannabis flower was never sprayed with neonics or chlorpyrifos, and was tested by an accredited lab to verify this; but the rose is routinely doused with toxins with little to no public posting. Children and recreational public space users are in constant, direct contact with lawns, flowers, and shrubs that are routinely sprayed with toxic chemicals that have documented human health and environmental risks. This direct contact with chemicals puts them at risk of critical and life-altering health complications. Non-toxic, minimal risk, biological, and organic alternatives abound; it is time to change the law to reflect Oregon's prioritization of human and environmental health over conventional attachment to chemicals.

We don't understand why the Cannabis industry has been able to implement a set of safe, allowable, residue-tolerance exempt and/or 25(b) FIFRA exempt products (OAR 333-007-0400) successfully on their crops, and yet city officials are refusing "Organic Land Care" proposals or are asking for years to phase out chemicals we know are hurting people and the environment. After the passing of Measure 91, Recreational & Medical Cannabis production quickly became subject to a set of rules and guidelines (OAR 333-007-0400 and OAR 845-025-2070 which diverts to ORS 634 & OAR 603-057) that strictly prohibited the use of RUP's and any non-exempt pesticides. We didn't receive a phase-out period since The State recognized the immediate dangers of pesticide exposure. The cost to producers was that many of their crops had to be destroyed (OAR 333-007-0450) because they didn't meet the new rules. We aren't asking that city landscapes take the same loss in productivity without available alternatives. We are asking that toxic chemicals are prohibited from use in public space, while tried and true organic alternatives are proposed and implemented immediately.

It is true that the risks associated with pyrolyzing pesticides on Cannabis are vastly unknown. Yet we were still asked to implement and adhere to safety guidelines in the interest of human health. The dangers of chemicals (like chlorpyrifos) currently being used on city landscapes ARE KNOWN. Countries around the world have banned their use entirely. Our fellow testifiers have detailed the extreme human health and environmental risks associated with exposure to these chemicals. If a young, pioneering industry can support and adopt pesticide-safety rules immediately, we see no reason why the spaces we bring our children to play are not subject to the same regulations. While we understand that landscapes are not meant for consumption (like Cannabis), they are inherently created as "safe spaces" for people, plants, and animals. It is beyond debate that park space users make direct contact with plants that have been sprayed with chemicals, entering human and environmental systems through touch and unintended consumption. If the risks for direct contact are known (i.e. required use of PPE's and abiding by REI's to prevent known health issues) on public landscape plants, but the risks of consuming Cannabis sprayed with RUP's are unknown, we cannot see the logic in regulating one arena and not the other. We are protecting one industry from unknown dangers while "purposefully avoid(ing) inconvenient truths" (Barnett, 2018) about pesticides in landscape management. How can one justify the regulation of one industry's pesticide use, limited to consumption by adults, but not regulate another industry (public land management) where we both know the documented health effects, and can predict frequent child use of the space? This premise is illogical, and the time for change is now.

The success of the Cannabis industry's immediate adoption of regulated pesticide use proves that when given the chance, Oregon will implement regulations that protect its citizens and environment first. We are giving you that chance now, to make changes that undo outdated, toxic land management policy in favor of "Organic Land Care" that has proven to increase both the safety and productivity of our land. We trust you will choose people and the environment over age-old attachments to conventional practices that have been proven to harm both people and the environment. If we can do it, so can you! Thank you for taking action to protect Oregon's landscapes, prohibiting chemical pesticides in public space, for considering Beyond Toxics' land care IPM, and for setting a national example for how "Organic Land Care" can solve the issue of pesticide-related illness, environmental degradation, and can simultaneously reduce the use of petrochemicals and fossil fuels. Please support SB 853.

In Earnest,

Erika Winters (Charity Director)
Wendy Mintey (Board Secretary)
Anna Kaplan (Board President)
Heidi Fikstad (Board Vice-President)
Bunni Krass (Board Treasurer)
Micayla Harland (Membership Director)
Bridget Gavin (Board Seat).
Kathryn Albert (Board Seat)

Link to guidelist →
https://www.oregon.gov/ODA/shared/Documents/Publications/PesticidesPARC/GuidelistPesticideCannabis.pdf

Link to bulletin →
https://www.oregon.gov/olcc/marijuana/Documents/Interagency_Cannabis_Pesticides_Letter.pdf

ODA Guidelist - OAR 845-025-2070 referencing accordance with ORS 634 and OAR 603-057 - ODA Guidelist originally introduced 1/11/16

From:	Yvonne Shaw
To:	Exhibits HAGLU
Subject:	Please support HB 3058/SB 853
Date:	Monday, March 25, 2019 11:01:19 AM

Dear Mr. Clem,

Did you know that 80% of backyard beekeepers in the U.S. only stay in the game for 2 years? Most cite heartbreak and expense when their colonies die as the reason they quit. Pesticide poisoning is a major contributor to colony death.

I support HB 3058 to create stronger legislation to ban/restrict chlorpyrifos/neonics in Oregon.

I am an urban beekeeper. I don't think I'm impacted by farming applications of chemicals, but I can't be sure. I do know that I'm at the mercy of anyone who lives within 3 miles of my house because that's how far my bees go to forage.

I'm doing my part to support pollination processes in my neighborhood since there are few native bees in the area. This is no easy task, as bee foods and supplements are expensive, hive components cost money and mite treatments cost me time, money, and effort. My meager sales in honey and beeswax candles offset the cost a bit, but this is a labor of love.

My neighbors thank me on a regular basis because their gardens do so well. They are truly grateful.

I lost a colony last summer after one neighbor treated with pesticides. Three days after he sprayed around his house and yard, I had a pile of dead bees in front of my colony. All bees inside were dead. Classic poisoning. Thankfully, my other two hives survived.

I purchased that colony for about $150.00, plus about $100 in sugar and supplements, and another $50 for mite treatments. It cost about $300 to purchase the equipment for that particular hive set up. I can reuse the equipment, but I'm out $300 cash, plus my time, and they died just as they were starting to create honey stores, so I lost about $500 in revenue from honey sales. Pesticide contaminated wax is toxic. So no candles, either.

All because my neighbor didn't want to hassle with a few bugs on his patio.

When he found out that his pesticide application likely killed my hive, he was truly mortified and apologetic. My bees were pollinating his raspberries when they were exposed! He had no idea of the unintended consequences of his actions. I believe this is true of many urban dwellers. They don't understand that if just a couple of my bees are exposed to those chemicals, they will bring it back to the hive and the entire colony dies.

This is only one reason to restrict these pesticides. There are many more and you will hear from many people with different perspectives. Mine is only one piece of a larger picture. So for my part, I will say, Mr Clem, give us backyard beekeepers a break and support stronger legislation to ban/restrict chlorpyrifos/neonics in Oregon.

Kind regards

Yvonne Shaw
308 NE 33rd Ct.
Hillsboro, OR 97124
(971) 217-0046