March 20, 2019

Senate Committee on Environment and Natural Resources
Oregon Legislature
900 Court St. NE,
Salem Oregon 97301

Dear Chair, Vice Chair and Members of the Oregon Legislature Senate Committee on Environment and Natural Resources:

We are writing to urge your support and passage of Senate Bill 853.

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, House Bill 3058, 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

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[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.

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[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.

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[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.

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[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.