

# IPM IMPLEMENTATION IN SCHOOLS

## *Highlights and Issues*

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**Oregon State**  
University

# What's the background?

Why do we pay attention to IPM implementation in schools more than other settings?

# Pesticides and Children

All pesticides have some level of toxicity, and pose some **risk** to infants and children. The risk depends on the **toxicity of the pesticide ingredients** and how much of the pesticide a child is exposed to.

**Infants and children are more sensitive to the toxic effects of pesticides than adults.**

- An infant's brain, nervous system, and organs are still developing after birth.
- When exposed, a baby's immature liver and kidneys cannot remove pesticides from the body as well as an adult's liver and kidneys.
- Infants may also be exposed to more pesticide than adults because they take more breaths per minute and have more skin surface relative to their body weight.
- Children often spend more time closer to the ground, touching baseboards and lawns where pesticides may have been applied.
- Children often eat and drink more relative to their body weight than adults, which can lead to a higher dose of pesticide residue per pound of body weight.
- Babies that crawl on treated carpeting may have a greater potential to dislodge pesticide residue onto their skin or breathe in pesticide-laden dust.
- Young children are also more likely to put their fingers, toys, and other objects into their mouths.



# What Are The Concerns?

## **Academic Achievement**

A healthier environment leads to healthier children. Healthier children have a higher academic achievement.

## **Asthma and Absenteeism**

The number one cause of absenteeism in the United States is asthma. Most exacerbations are due to environmental triggers. Common pests in schools such as mice and cockroaches are asthma triggers.

## **Disease Vectors**

Rodents, cockroaches, feral cats, nesting birds, and other pests can all be disease vectors. Stings from yellow jackets can cause anaphylactic shock.

## **Children and Pesticides**

Children are NOT little adults. They are still growing and developing. They have greater metabolic demands, as well as anatomic and physiological differences that make them more susceptible to the risks associated with pesticides.

## **Pesticide Misuse**

Monthly preventative pesticide applications and unsanctioned use of pesticides by well-meaning school employees increase the risks to people and the environment.





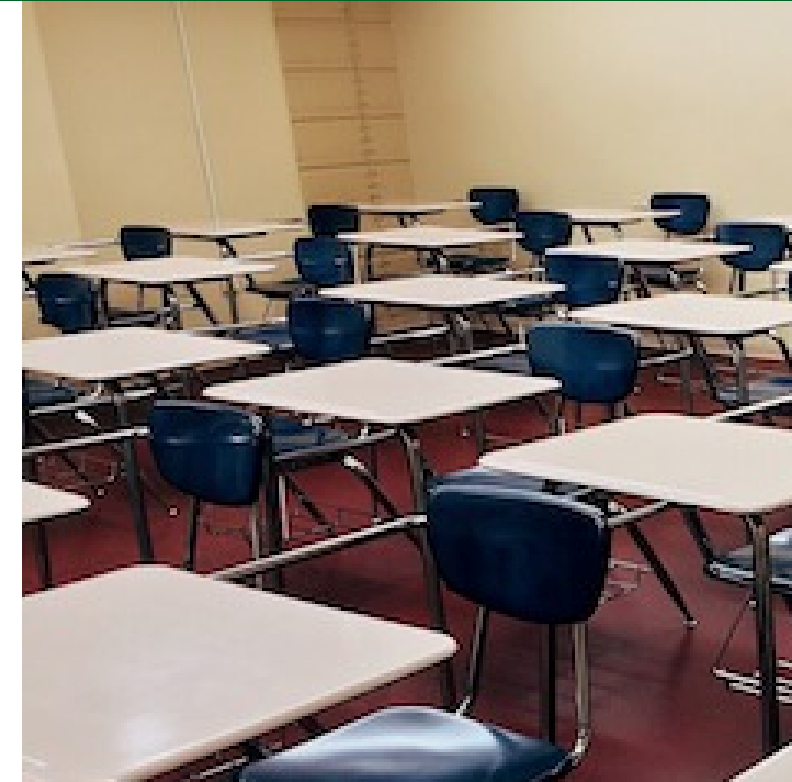
# School IPM

Using the **integrated pest management** approach at schools and childcare facilities has many benefits. Research has demonstrated:

- IPM can be more effective than routine pesticide treatments,
- IPM can cost less over the long term, and
- IPM can reduce children's exposure to pesticides. That's important because children may be more sensitive to their toxic effects.

Many **states** have School IPM programs. There are many resources for people who want to start using IPM in schools, including **sample forms for professionals** and **pest-specific action plans**.

- Oregon has approximately 197 school districts.
- They range from one site/facility to 90 sites/facilities



# What does the School IPM law in Oregon require?

ORS 634.740 was effective July 1, 2012



## What Does The Law Require?

- All public and private K-12 schools and community colleges must comply
- They must have an IPM Plan (written) in place, a designated IPM Coordinator, and a list of acceptable low-impact pesticides.
- The IPM Plan must include regular monitoring and inspections, prohibit routine (schedule-based) pesticide applications, and give preference to nonchemical pest control methods.
- The School IPM Coordinator must complete six hours of training each year, and oversee all efforts related to pest prevention, pest identification, pesticide selection, giving advanced notice to families, posting warnings and keeping records

# Regulating Pesticide Use in United States Schools

Table 1. State School Pest Management Regulations as of October 31, 2013.

State	Restricted Spray Zone	Interior Posting	Outdoor Posting	Pre-Notification	Reentry or other Requirements Beyond label	Min Requirements for Applicators (Training, Certification, Supervision, etc.)	Defines Types of Products to be Used	Exempt Products from Notification
Alabama	X <sup>2</sup>					X		
Alaska		X	X	X	X	X		
Arizona	X	X	X	X		X	X	X
Arkansas								
California		X	X	X	X		X	X
Colorado			X					
Connecticut	X		X	X	X	X	X	
Delaware						X		
Florida			X			X		
Georgia		X	X		X	X	X	X
Hawaii								
Idaho								

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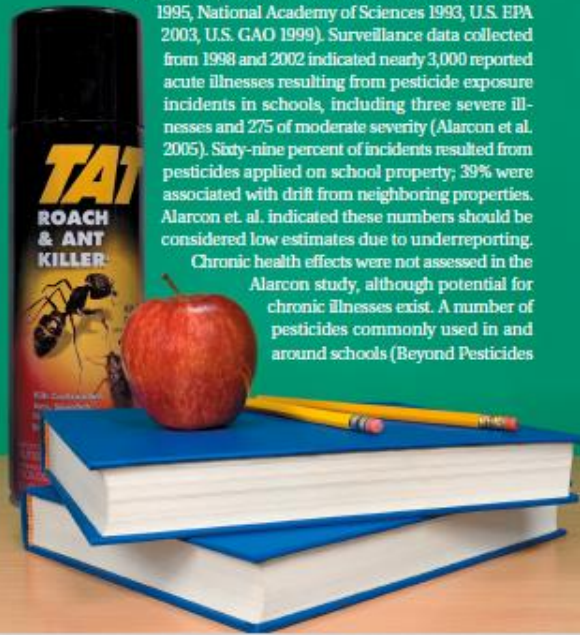
State	Restricted Spray Zone	Interior Posting	Outdoor Posting	Pre-Notification	Reentry or other Requirements Beyond label	Min Requirements for Applicators (Training, Certification, Supervision, etc.)	Defines Types of Products to be Used	Exempt Products from Notification
Oregon		X	X	X	X	X	X	

grams for the future.

Reducing pests in school environments is a worthy goal. Development of asthma, asthma attacks, and asthma-like symptoms have been conclusively associated with exposure to cockroaches, rodents, and dust mites (Bonnefoy et al. 2008, Gore and Schal 2007). Asthma is the number one cause of student absenteeism in the U.S., resulting in loss of 14.4 million school days per year (American Lung Association 2011, Akinbami 2006). The Centers for Disease Control and Prevention (CDC 2012) reported that in 2010, 9.4% of the nation's children were affected. Nichols et al. (2005) reported that between 2001 and 2003, more than 28% of children in one urban center were affected. An estimated \$8 billion to \$50 billion per year was spent caring

to-ground, and hand-to-floor behaviors (Goldman 1995, National Academy of Sciences 1993, U.S. EPA 2003, U.S. GAO 1999). Surveillance data collected from 1998 and 2002 indicated nearly 3,000 reported acute illnesses resulting from pesticide exposure incidents in schools, including three severe illnesses and 275 of moderate severity (Alarcon et al. 2005). Sixty-nine percent of incidents resulted from pesticides applied on school property; 39% were associated with drift from neighboring properties. Alarcon et al. indicated these numbers should be considered low estimates due to underreporting.

Chronic health effects were not assessed in the Alarcon study, although potential for chronic illnesses exist. A number of pesticides commonly used in and around schools (Beyond Pesticides



Nevada								
New Hampshire			X	X <sup>2</sup>		X		
New Jersey	X	X	X	X	X	X	X	X
New Mexico		X	X	X	X	X		
New York			X	X		X	X	
North Carolina	X			X				X
North Dakota								
Ohio		X	X	X	X	X		X
Oklahoma								
Oregon		X	X	X	X	X	X	
Pennsylvania		X	X	X	X	X	X	X
Rhode Island			X	X	X	X	X	X
South Carolina						X		
South Dakota								
Tennessee						X		
Texas	X <sup>2</sup>	X	X	X <sup>2</sup>	X	X	X	X
Utah				X				
Vermont			X					
Virginia		X	X	X		X		
Washington		X	X	X				
West Virginia		X		X	X	X	X	X
Wisconsin		X	X			X		
Wyoming		X	X	X				
	10	20	30	28	17	31	15	16

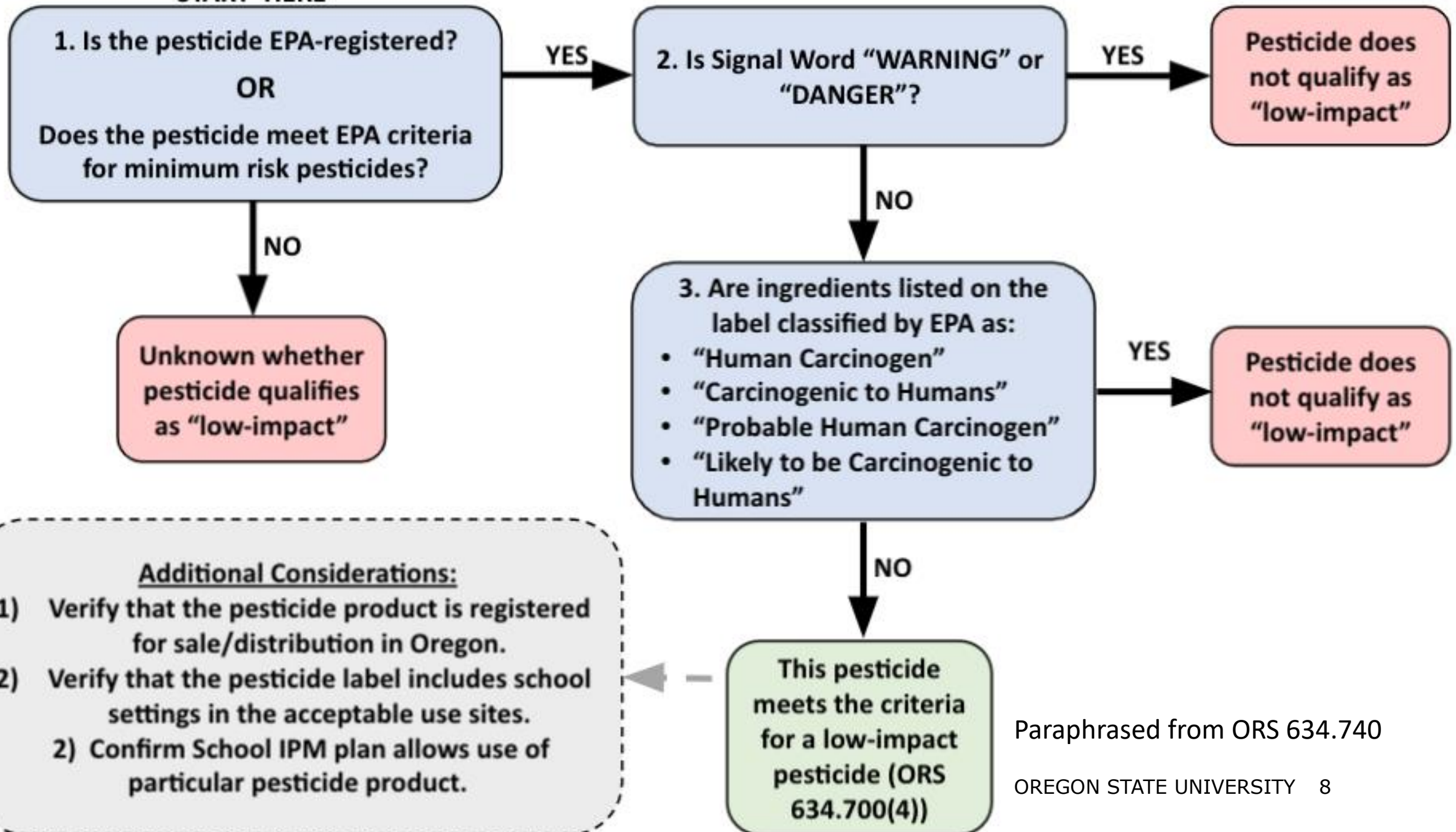
<sup>1</sup> Schools must maintain a list of pesticide hypersensitive students

<sup>2</sup> Located under Ag Code

<sup>3</sup> Pre-notification for child care



**START HERE**



Paraphrased from ORS 634.740

# Highlights

# OSU School IPM Program



Ten+ training events per year, held around the state of Oregon

- Annual IPM Coordinator Training. Meets the training requirements for all designated School IPM Coordinators. This is the best time/place to learn new IPM techniques and share with peers. Training events take place at a school, and include indoor and outdoor hands-on site inspections. The OSU Turf Management Program co-trains at every annual IPM coordinator training event.
- Model IPM Plans. The governing body of each school district or school (as defined by ORS 634.700 (8)) is required to have and implement an IPM plan. Model IPM Plan templates developed by the Program for use in schools can be modified to fit each school's unique situation.
- Other Training and Resource Materials. The OSU School IPM Program website houses a number of materials created by the Program, as well as others created by or with school districts, the OSU Turf Management Program, Washington State University, the Oregon Department of Agriculture and others. Additional materials are provided to participants at Annual School IPM Coordinator Training events.

Heavier on the resources, lighter on the technical assistance

## EXTENSION

# Developing and Delivering a Needs-Based Integrated Pest Management Program for Public School Grounds Employees

Alec R. Kowalewski,\* Tim W. Stock, Brian W. McDonald,  
Clint M. Mattox, and Brian L. Daviscount

### ABSTRACT

Oregon Statute requires all Oregon schools to adopt an integrated pest management (IPM) plan, create a list of acceptable low-impact pesticides, designate an IPM Coordinator, participate in annual training for IPM Coordinators, and provide periodic training for other school employees. To assist Oregon schools in meeting the requirements of the Oregon IPM in schools law, we developed an engaging and needs-based IPM training curriculum for public school IPM Coordinators and grounds employees in the Portland Metropolitan area. We used a focus group and survey to identify high-priority training topics. These topics were (1) landscape rodent management, (2) landscape and turf weed management, (3) hard-scape weed management, (4) building a low-maintenance landscape,

**A**s of 2009, the state of Oregon requires all schools (K–12 public and private) to implement integrated pest management (IPM) (Integrated Plant Protection Center, 2013; Oregon Legislative Assembly, 2009). Some of the requirements of this bill include the development and implementation of an IPM plan, designating an IPM Coordinator for the respective school districts, annual and periodic IPM training for the designated IPM Coordinators and school employees, respectively, and the development and use of a state accepted low-impact pesticide list (Integrated Plant Protection Center, 2014b). Within this statute, low-impact pesticides are defined as those that do not contain active ingredients with the signal word “warning” or “danger,” or contain an active ingredient classified as a probable or known human carcinogen (USEPA, 2005).



Table 1. In a survey distributed at 6 regional Oregon State University School Integrated Pest Management (IPM) training events (Ontario, LaGrande, Eugene, Sherwood, Salem and Riley school districts) attendees ( $n = 220$ ) were asked to select one topic which they wanted to hear more on during future training, 19 July to 26 Apr. 2013.

Question	Response
	%
Weeds/grounds/herbicides	22.73
Outside mammals/rodents	14.55
Other/miscellaneous	9.55
Licensing/law	9.09
Pesticide lists and usage	6.36
Birds/bats	5.91
Wasps/bees/yellow jackets	5.91
"Bugs"/"pests"	5.91
Training staff	5.91
Spiders	3.18
Ants	3.18
Roundtable/open discussions	2.73
IPM plan	2.73
Lice/bedbugs/mold	2.27

## Developing and Delivering a Needs-Based Integrated Pest Management Program for Public School Grounds Employees

Alec R. Kowalewski,\* Tim W. Stock, Brian W. McDonald,  
Clint M. Mattox, and Brian L. Davis court

Q3: In your school district, how many pesticide applications would you estimate...  
...were made 5 years ago?

R1	50
R2	120
R3	100
R4	20
R5	19
R6	3-4
R7	3

...were made in the last year?

R1	30
R2	0
R3	80
R4	10
R5	64
R6	3-4
R7	1



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Q4: If the number of applications has changed over the last 5 years, what factors have led to this change (chose more than one if applicable)?

Answer choice

Responses ( $n = 7$ )

Decreasing budgets	0.00%
Increased laws and restrictions	71.4% 
Decreasing labor forces	14.3%
Public concerns	28.6% 
The number of pesticide applications has not changed over the last 5 years	14.3%
Other (please specify below)†	28.6%

Q5: Do you plan to decrease the number of pesticide applications made per facility, or site, in response to the OSU Landscape IPM training which was provide in the fall of 2013 or spring or 2014?

Answer choices

Responses ( $n = 7$ )

Yes	71.43%
No	28.57%

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# OSU School IPM Program



Special Projects and Initiatives. The OSU School IPM Program has led or contributed to a number of projects and initiatives:

- Insect ID Classes
- Pesticide Storage site assessments and training
- Training of Environmental Health Specialists (County Health Inspectors)
- "Rodent Academy"
- ODA school-specific pesticide license category
- Site assessments, training and educational materials for Head Start programs
- Low-maintenance ground covers (demonstration plots, training)
- Demonstration plots, training and educational materials on mowing, fertilization, and irrigation

Maintenance of Low-Impact Pesticide List. The Program supported creation and maintenance of the list through May 2018. 



# OSU School IPM Program



## Low-Impact Pesticides List

[Low-Impact Pesticides List \(.PDF\)](#)



List of products that meet the legal requirements of a low-impact pesticide.

[ODA Guidance on Low-Impact Pesticides \(.PDF\)](#)

How you can determine whether a pesticide is low-impact

## Forms

[Pesticide Application Notification Form \(.PDF\)](#)

[Pesticide Application Posting Poster \(.PDF\)](#)

[Pesticide Application Posting Poster/Template with Notification & Record-Keeping \(Word\)](#)

[ODA Pesticide Application Recordkeeping Forms \(.PDF\)](#)

[ODA Checklist for Contracted Pesticide Applicators \(.PDF\)](#)

[ODA Checklist for School Staff Who Apply Pesticides \(.PDF\)](#)

## Useful Information

[All About Pesticide Applicator Licensing \(.PDF\)](#)

[Notification, Posting, Record-Keeping Requirements \(text from the law\) \(.PDF\)](#)

# Issues

# Issues known to Kaci Buhl (me):

- The School IPM Coordinator and/or district often hires a company to make pesticide applications when needed. Is there **disconnect** between the trained school employee and the commercial pest control company?
- Staff **turnover** is common among school personnel in the School IPM Coordinator positions. Knowledge goes out the door and training begins anew.
- Pest management is people-management. It can be difficult to garner **cooperation** from all teachers, staff, administrators, and other site-users.
- Moss control is problematic on sidewalks and roofs using low-impact pesticide products and/or other methods.
- ODA inspections related to school IPM in 2017-19 revealed widespread **misunderstanding** of the law's requirements. Many schools lacked plans.

# In summary...

- There will be an enduring need for education about IPM theory and practice in school settings.
- Site-managers need resources and technical assistance to meet pest control challenges lawfully.
- ODA and OSU should continue to communicate openly and often about aligning educational efforts with observed deficits (enforcement and/or incidents)



# OSU School IPM Program

About Resources & Forms Pests Turf Pesticides IPM Law Donate

## About



## Our Mission

The mission of the OSU School IPM Program is to work with schools to improve pest management while reducing costs, workload, and the risks from pests and pesticides.

The ultimate goal of the Program is to protect the health and safety of students and school staff via sustainable and continual improvement of pest management in Oregon's schools.

Tim Stock, School IPM Program Director

Alec Kowalewski, Associate Professor, Turf Management

Both housed in the Horticulture Department, College of  
Agricultural Sciences, Oregon State University



## Leading the Nation in Pesticide Outreach & Education



**PERC** Pesticide Educational  
Resources Collaborative



**PERC-med**  
Pesticide Educational Resources  
Collaborative - Medical

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