

Pest Control Practices in Oregon Public Schools

Oregon Environmental Council

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Executive Summary

Choices in pest control are very important for the health and safety of students and staff. Pests can carry disease, contaminate food supplies, and trigger allergic reactions. However, the use of pesticides can put the health of students and staff at risk.

As a growing body of evidence draws connections between human health and environmental contaminants like pesticides, some schools are seeking safe and effective pest management programs that cut dependence on toxic chemicals. A key strategy is pest prevention, with limited use of least-toxic chemical pesticides when necessary.

The Oregon Environmental Council (OEC), in conjunction with the Oregon Department of Education (ODE), surveyed all of Oregon's 198 public school districts regarding their pest management practices. One hundred and three districts responded to the survey, representing more than half of Oregon school districts and about 375,000 of the 551,000 (68%) students attending public school in the state.

This report summarizes the findings of this survey and represents the most comprehensive assessment of pest control practices in Oregon schools to date.

Recommendations for reducing pesticide use in Oregon schools are included at the end of the report.

By adopting a cautious approach, schools can reduce or even eliminate the risks associated with pesticides altogether using simple, low-cost methods such as Integrated Pest Management. With proper training, planning, and effective communication among affected parties, these methods can prevent pest problems, reduce the need for pesticide applications, act as an educational tool for students, and greatly improve the quality of the school environment.

Survey Findings:

- 1. Pesticide-free schools are uncommon in Oregon, and most pesticide use is for weed control.** Only 13 % of school districts responding said they never use pesticides. Of the 87% who report using pesticides, most of this use (87%) is to kill weeds outside the buildings, on athletic fields, lawns and playgrounds.
- 2. Pesticides are primarily used only when pests are present.** Sixty-six school districts said they only apply pesticides when a pest problem is present. Nineteen reported applying pesticides once per year, and six districts reported using pesticides on a monthly basis.

- 3. Some Oregon schools are still using highly toxic pesticides.** For the school districts who reported any pesticide use, 26 different pesticide active ingredients were used by two or more of these districts. While all of these pesticide products are legal and approved for use, 20 (or 77%) are linked to cancer, reproductive problems, hormone (endocrine) system damage or nervous system damage. In addition, two are considered highly acutely toxic (PAN Database, 2005).
- 4. Most schools have no pest control policy in place to guide their pest control practices and decisions.** Only 29 school districts (or about 28%) reported having a pest control policy in place to guide their pest control practices and decisions. Many of the schools who reported having these policies in place were larger in size; however, 10 of the larger districts (enrollment above 5,000) still are operating without a pest control policy in place.
- 5. Most schools are not familiar with Integrated Pest Management (IPM) but most are interested in learning more about it.** Only 31 (Or 30%) districts said they were familiar with Integrated Pest Management (IPM) and that they used it at their schools; another seven districts reported that they were familiar with IPM but did not use it. Most of the larger school districts (enrollment above 5,000) said they are familiar with and use IPM. Meanwhile, 68 of the districts reported that they were interested in learning more about IPM.
- 6. Most schools failed to comply with Oregon's Pesticide Use Reporting law during the one year it was operational, but most want to know more about what the law requires of them.** Just under 30% of responding school districts said they filed pesticide use reports with the Oregon Department of Agriculture in 2002 (2002 was the only year that ODA actually required pesticide users to report their use under the Oregon law). Just under 70% of responding districts said that they would like to know more about the requirements for reporting pesticide use under this law.

Introduction

Choices in pest control are very important for the health and safety of students and staff. Pests can carry disease, contaminate food supplies, and trigger allergic reactions. However, the use of pesticides can put the health of students and staff at risk.

As a growing body of evidence draws connections between human health and environmental contaminants like pesticides, many schools are developing safer, more effective pest management programs that cut dependence on toxic chemicals. In addition, these schools focus instead on pest prevention, with limited use of least-toxic chemical pesticides when necessary.

The Oregon Environmental Council (OEC), in conjunction with the Oregon Department of Education (ODE), surveyed all of Oregon's 198 public school districts regarding their pest management practices. This report summarizes the findings of this survey and represents the most comprehensive assessment of pest control practices in Oregon schools to date. Recommendations for reducing pesticide use in Oregon schools are included at the end of the report.

One hundred and three districts responded to the survey, representing more than half of Oregon school districts and about 375,000 of the 551,000 (68%) students attending public school in the state. More than half of the districts who responded are small – less than 1,000 students. Another 27% enroll between 1,000 and 5,000 students, and about 20% of the responding districts have enrollment over 5,000. This breakdown in size is very similar to the breakdown for all Oregon school districts. Furthermore, the districts who responded are geographically distributed across the state.

Other surveys have been conducted to better understand pest control practices in Oregon schools. In early 2004, the Oregon Department of Agriculture (ODA) released a report describing a survey of 13 Oregon school districts with regard to their familiarity with and level of implementation of Integrated Pest Management (IPM). IPM is an approach to pest management that reduces or eliminates the use of toxic pesticides. The ODA found that 9 of the 13 districts surveyed were familiar with IPM as a formal concept (ODA, 2004).

As a growing body of evidence draws connections between human health and environmental contaminants like pesticides, many schools are developing safer, more effective pest management programs that cut dependence on toxic chemicals.

This report represents the most comprehensive assessment of pest control practices in Oregon schools to date.

Pesticides are toxic by design and definition.

Children are highly susceptible to the effects of toxic chemicals and may not be protected under current regulations (NAS, 1993).

In 2002, the Oregon Department of Education conducted a survey of 365 6th through 12th grade principals about a range of issues, including pest control policies. Only 24% of those responding said their school had an integrated pest management plan.

Methods

Surveys with cover letters and self-addressed, stamped envelopes were sent to all 198 Oregon school districts in June 2004. The cover letter was signed by a Program Director from OEC and Superintendent of Public Instruction Susan Castillo. The letters were sent to facility managers where we had their names; otherwise the surveys were sent to the district superintendent.

Several months after sending the survey, OEC called several of the districts that had not responded. By November 2004, OEC had received one hundred and three surveys, representing more than 50% of the school districts in Oregon and about 68% of the students enrolled in public school in Oregon (one district returned their survey in early 2005).

For the purpose of this report, we use the term pesticide to describe any insecticide, herbicide, fungicide, and rodenticide. These chemicals are toxic by design and definition. As the National Research Council has stated, they are “the only toxic substances that are purposefully applied to the environment” (NRC, 1993). Pesticides can cause harm to humans, animals, or the environment because they are designed to kill or otherwise adversely affect living organisms (U.S. EPA, 2005).

The survey clearly stated that we would keep the results of individual surveys confidential and would not be used for another purpose. Therefore, nowhere in this report do we identify any school districts by name.

Pesticides and Children’s Health

According to the National Academy of Sciences, children are highly susceptible to the effects of toxic chemicals and may not be protected under current regulations (NAS, 1993). Not simply “little adults”, children are in the midst of highly complex, and vulnerable, developmental processes that regulate tissue growth and organ development. Their body

systems are not yet fully developed, making them both more susceptible than adults to long-term damage from toxins and less able to process and eliminate those toxins.

Children are also more vulnerable because of their incomplete developmental stage, physiology, and age appropriate behaviors. They eat, drink, and breathe more per pound of body weight than adults. In addition, since children are closer to the ground, they are more likely to have contact with floors, lawns, and playgrounds where contaminants settle, increasing their likelihood of exposure to environmental contaminants. Young children's tendency to put their hands and objects into their mouths also increases the risk of exposure to pesticide residues.

Pesticides can cause a variety of short-term (acute) and long-term (chronic) health effects. Possible acute symptoms of exposure include headache, nausea, diarrhea, dizziness, skin rash, and respiratory irritation (Reigart, et. al., 1999).

Exposure to pesticides during childhood can have considerable impacts on long-term health. Scientific studies link pesticides to asthma, cancer, birth defects, nervous system disorders, reproductive problems, endocrine disruption, neurological problems, learning disorders, and immune deficiency (Ontario College of Family Physicians, 2004). Cancer rates in the United States, including childhood cancer, have increased in the last thirty years, and many scientists and researchers attribute part of the increase to pollution in the environment, including pesticides (Schettler, 1999).

Certain classes of insecticides have known effects on the nervous system, specifically on developing children. An increasing amount of evidence shows that pesticides can mimic or block the action of naturally occurring hormones in the body, resulting in reproductive problems and birth defects in wildlife, as well as declining sperm counts, increasing cancer rates, and birth defects in humans (Schettler, 1999).

In addition, in regulating pesticides, the federal government evaluates health impacts from pesticide exposure on adult men, not children. This means that children's size and vulnerability to exposure are not taken into account during pesticide registration.

Why children are more vulnerable to pesticides:

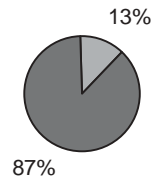
- ◆ Their bodies are growing and developing
- ◆ Age-appropriate behaviors (such as tendency to put hands in mouth)
- ◆ Children eat, drink and breathe more per pound of body weight than adults

Survey Results

1. *Pesticide Free Schools Are Uncommon in Oregon*

When asked if pesticides are ever applied on school grounds, 87% of districts answered yes, while only 13% said pesticides are never applied on school grounds or in school buildings.

Figure 1: 13% of Districts Say Pesticides are Never Applied on School Grounds or in School Buildings

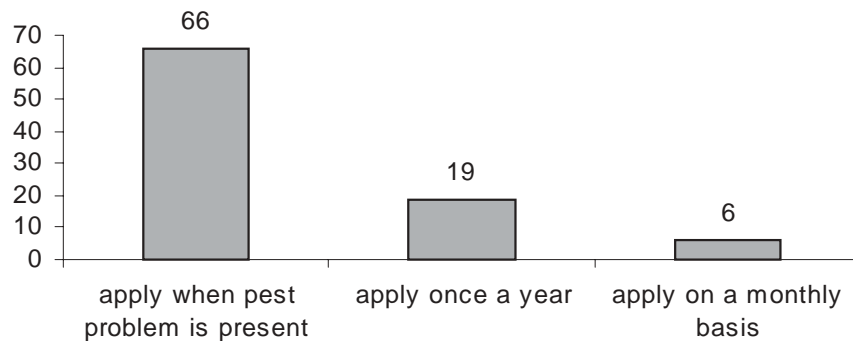


■ pesticide free school districts ■ districts that use pesticides

2. *Pesticides Are Primarily Used Only When Pests Are Present*

Sixty-six school districts said they only apply pesticides when a pest problem is present. Nineteen reported applying pesticides once per year, and six districts reported using pesticides on a monthly basis.

Figure 2: Timing of Pesticide Applications



3. *Herbicides Are the Most Commonly Used Type of Pesticide*

We asked school districts to list the pesticides they used for the 2003/04 school year. Of the 103 surveys returned, 76 provided this information. Most of the 27 other districts did not provide a list of pesticides because they rely on a privately-owned pest control company to apply pesticides and they did not know the names of the pesticides their contractors used.

The schools reported using a total of 82 different pesticide products, representing over 50 active ingredients (an active ingredient is the chemical agent used in the pesticide product that is designed to kill the pest). Of these active ingredients, 30 were used for killing weeds (herbicides), 23 were used to kill bugs (insecticides), five were used to kill rodents (rodenticides), and two were used to kill fungus (fungicides) .

A total of 26 different pesticide active ingredients were used by two or more of reporting districts. Of these 26 active ingredients, 20 (or 77%) are linked to cancer, reproductive problems, hormone (endocrine) system damage or nervous system damage. In addition, two are considered highly acutely toxic (PAN Database, 2005).

Of these 26, the top seven most commonly used pesticides are described in Table I on the following page.

All but the last two pesticides on this list are herbicides, used to kill weeds. The last two chemicals are insecticides, and both of these affect the nervous system. Eight school districts also reported using ant food or ant sprays, but they did not include the name of the active ingredient, so we were unable to identify these pesticide products specifically.

By far, the majority of the pesticides used were applied on athletic fields, lawns and playgrounds.

Of the 50 active ingredients used by Oregon schools:

- ◆ 30 were used for killing weeds (herbicides)
- ◆ 23 were used to kill bugs (insecticides)
- ◆ 5 were used to kill rodents
- ◆ 2 were used to kill fungus

By far, the majority of the pesticides used were applied on athletic fields, lawns and playgrounds.

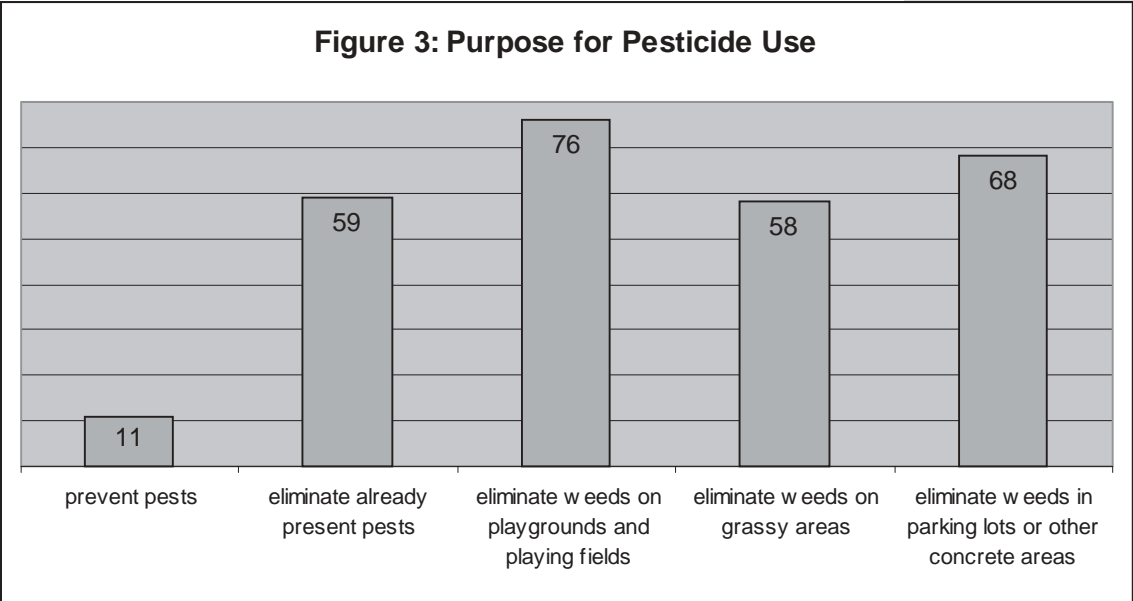
Table 1: Most Commonly Used Pesticides in Oregon Schools

Active Ingredient	Common Name	Number of Districts Reporting Use	Use	Health Concerns
Glyphosate	Round-up	53	herbicide	Associated with an increased risk of non-Hodgkins lymphoma (a type of cancer) (De Roos, 2003).
2,4-D	Cross Bow or Weedmaster	37	herbicide	Associated with an increased risk of non-Hodgkins lymphoma (McDuffie, 2001).
Dicamba	Trimec	14	herbicide	In laboratory animals, exposure to dicamba has caused decreases in body weight, liver damage and an increased frequency of fetal loss (California E.P.A., 1996).
MCPA and MCPP	Trimec	13	herbicide	MCPA & MCPP are chlorophenoxy-herbicides which, as a group, have been classified as possibly carcinogenic to humans.
Dichlobenil	Casaron	12	herbicide	Considered a possible carcinogen by the U.S. EPA.
Fipronil	Termidor	6	insecticide	Highly toxic to fish and other aquatic life. It is a neurotoxin.
Cyfluthrin	Tempo	6	insecticide	Considered a neurotoxin.

For more information about these and other pesticides used by Oregon schools, see Appendix I at the end of the report.

4. Weed Elimination is the Most Common Reason for Pesticide Use

The most common use for pesticides in schools districts is to eliminate weeds on school grounds. The graph below illustrates the specific reasons districts use pesticides (districts could check as many categories as applicable).



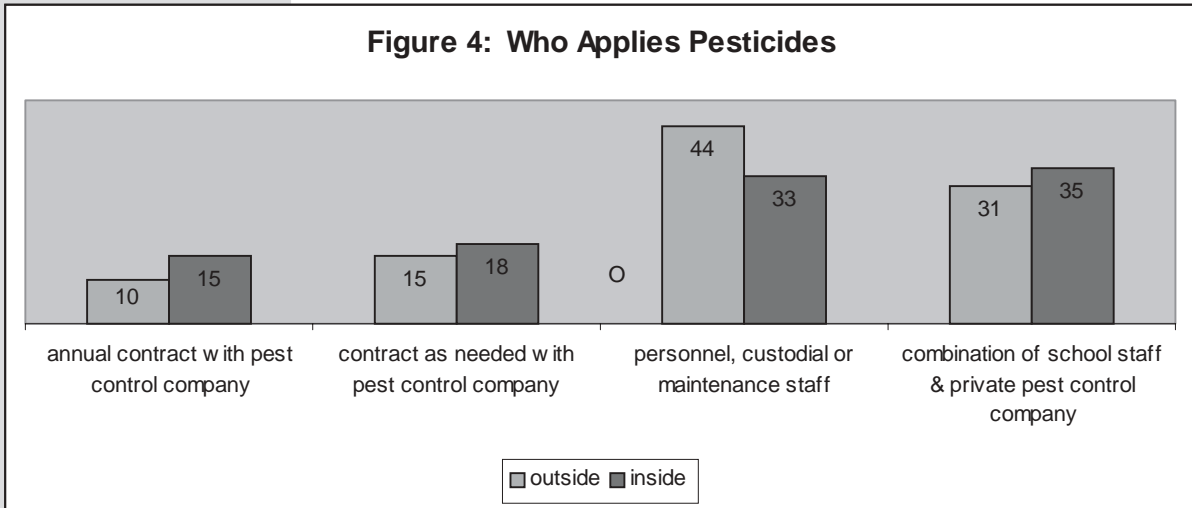
Note: numbers in the graph represent number of schools, not percentage.

5. Most Districts Rely on an Outside Pest Control Company in Some Manner

Each district was asked how they manage pests both inside buildings and outdoors. Use of a private pest control company was common, with 56 districts reporting involvement of a pest control company for their *out-of-doors* pest control needs, and 68 reporting the same for their *indoor* pest control needs. Forty four districts said they rely solely on school personnel to manage pests out-of-doors and only 33 rely solely on school personnel for indoor pest management.

Hiring a private pest control company may be a double-edged sword. The benefit of hiring these companies is that their employees are required to be trained and certified (which is not the case for school personnel).

However, pest control companies may be more likely to apply pesticides when they are not necessary.



Most districts do not have a designated annual budget for pest control.

6. Most Pesticide-Related Decisions Fall to Local School Staff

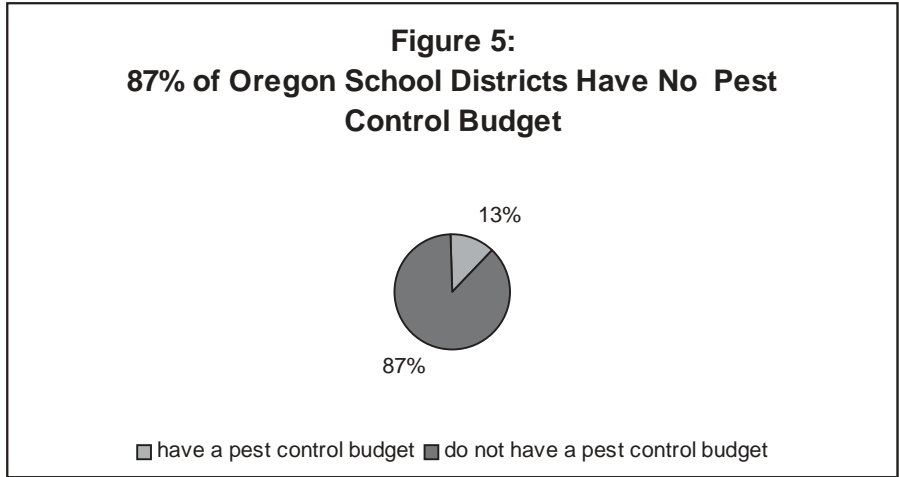
Nearly 75% of the districts responding said the local school maintenance staff or supervisor is the person in charge of deciding *where and when* pesticides will be applied. Another 25% rely on a contracted, private pest control company to decide where and when pesticides will be applied. In deciding *which* pesticides to apply, about 70% say the school maintenance supervisor makes that decision; while about 30% rely on their contracted pest control company to choose the products used.

7. Most School Districts Operate Without a Pest Control Budget

To better understand the costs associated with pest control practices in Oregon schools, we asked school districts about their pest control budget. We were interested in determining if schools with IPM programs had lower costs per student, as was found in a similar survey of North Carolina schools (Karel, et. al., 2003).

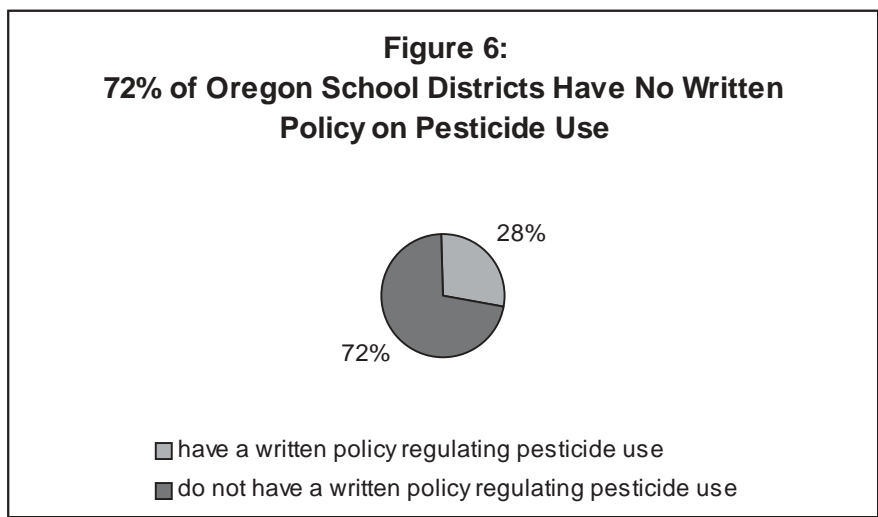
We found that most districts do not have a designated annual budget for pest control — only 13% of the responding districts answered “yes” to having such a financial plan. Most of these 13 districts were small and had pest control budgets that ranged from \$250-\$5000;

only two of the larger districts reported having a pest control budget.



8. *Pest Control Policies Are Also Uncommon*

Only 28% of the participating districts said they have a written policy regulating the use of pesticides and/or their pest control activities. Many of the schools that reported having these policies in place were larger in size; however, 11 of the larger districts (enrollment above 4,000) still are operating without a pest control policy in place.



The goal of Integrated Pest Management (IPM) is to minimize pest problems and curtail the need for high-risk chemical control measures by focusing on prevention.

In the U.S. National Park System, for example, IPM has dramatically reduced pesticide use while still maintaining effective pest control.

9. *Most Districts Are Not Familiar with Integrated Pest Management*

The goal of Integrated Pest Management (IPM) is to minimize pest problems and curtail the need for high-risk chemical control measures by focusing on prevention. IPM is an approach to pest control that utilizes regular monitoring to determine if and when treatments are needed. IPM employs physical, mechanical, cultural, biological and educational tactics to keep pest numbers low enough to prevent intolerable damage or annoyance (Seattle Public Utilities, 2002). Combinations of techniques such as improved sanitation, inspections, traps, companion planting, and gardening with native plant species can eliminate the need to apply highly toxic chemicals.

IPM ensures balance, protects the natural enemies that help keep pests in check, and avoids unnecessary chemical use that may endanger human health and the environment. This approach has been gaining acceptance worldwide and is mandated by many governmental agencies. In the U.S. National Park System, for example, IPM has dramatically reduced pesticide use while still maintaining effective pest control (Seattle Public Utilities, 2002).

The preventative approach of IPM reduces the overall need and cost for pest control. The Washington State Department of Ecology has published a guide to help schools estimate and compare the total costs of a conventional pest management program with the costs of an IPM program (Washington Department of Ecology, 1999).

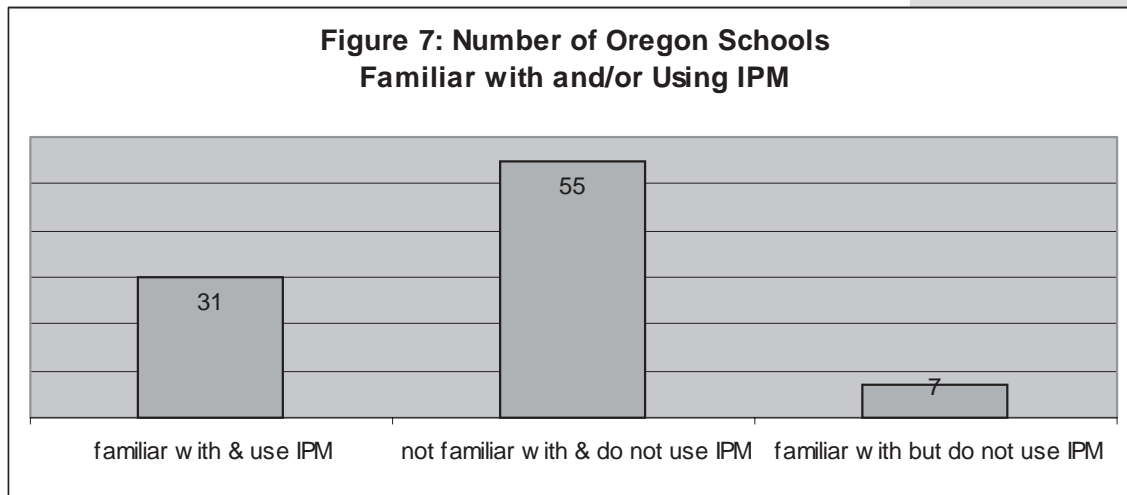
Only 31 (Or 30%) districts said they are familiar with IPM and that they use it at their schools; another seven districts reported that they were familiar with IPM but did not use it. Most of the larger school districts (enrollment above 5,000) said they are familiar with and use IPM.

Of the 63 districts who said they were not familiar with IPM, most also reported that they did not use IPM techniques. However, eight of these districts reported that they *did* use IPM, and another eight districts who

said they did not use it nevertheless reported using several of the IPM techniques outlined below.

When asked about specific IPM techniques, we found that:

- ♦ 34 districts regularly monitor for pest problems,
- ♦ 38 seal cracks and crevices,
- ♦ 44 have regular cleaning of food and other insect attractants,
- ♦ 41 have improved sanitation and housekeeping,
- ♦ 24 educate staff and students on how to reduce pest problems,
- ♦ 35 use non-toxic methods first,
- ♦ 39 use the least toxic pesticide products, and
- ♦ 32 say they avoid the use of highly toxic pesticides.



10. Most Schools Want to Learn More About Integrated Pest Management

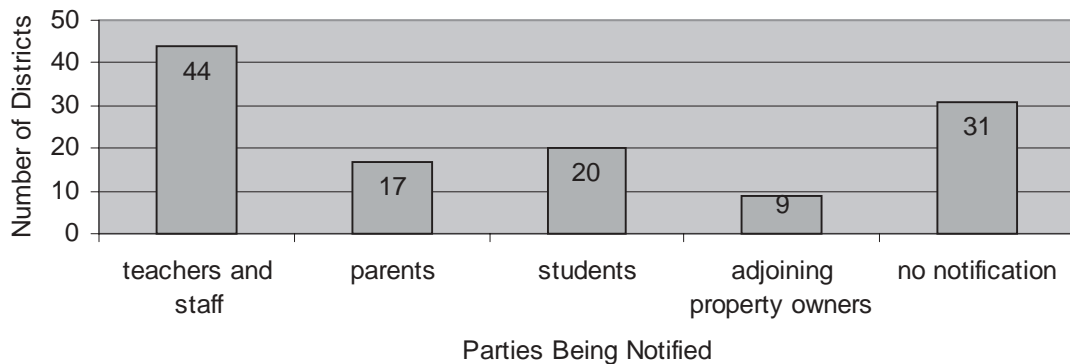
Schools showed a real interest in learning more about IPM. When asked, “Would your district be interested in learning more about IPM and ways in which it can help reduce environmental health risks and save money?” 68 districts (66%) said they would be interested in learning more.

11. *Some Schools Are Voluntarily Notifying Parents, Teachers and Others*

Unlike several other states, Oregon has no law requiring notification of parents or teachers before applying pesticides in schools. Notification allows parents and teachers to take precautionary measures and potentially to participate in the pest management decision-making process.

Although Oregon schools are not required to notify anyone at or near the school before or after applying pesticides, we found that some districts are voluntarily notifying teachers and staff, and some parents, students, and adjoining property owners about their pesticide applications. In fact, 44 districts reported that they notify teachers and staff before they apply pesticides.

Figure 8: Number of Districts Providing Notification When Applying Pesticides on School Grounds

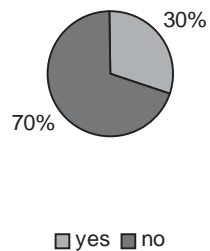


Only 29 of the responding districts (30%) reported that they complied with Oregon's statewide Pesticide Use Reporting law.

12. *Schools Show Low Compliance with Oregon's Pesticide Use Reporting Law:* In 2002, the Oregon Department of Agriculture required anyone who sprayed a pesticide for any commercial or government purpose to report that use (this was the only year that the program was funded). Only 29 of the responding districts (30%) reported that they complied with Oregon's statewide Pesticide Use Reporting law by reporting all pesticide use for the 2002 school year.

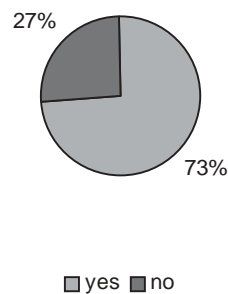
Conversely, 68 districts (70%) reported they did not report pesticide use for that year.

Figure 9: Districts Which Complied with the Oregon Pesticide Use Reporting Law in 2002 by Reporting All Pesticide Use



A lack of understanding of the requirements of the law may be the primary driver for this low reporting frequency. Over 70% of districts reported that they would like to learn more about reporting pesticide use under this law.

Figure 10: Percent of Districts Interested in Learning More About Reporting Pesticide Use



Over 70% of districts reported that they would like to learn more about reporting pesticide use under this law.

Conclusion and Recommendations

Given the inherent risks associated with pesticide exposure, particularly for children, programs, policies and other efforts that reduce pesticide use and exposure are warranted. Schools across the country are seeing the benefits of implementing safer pest management practices that do not rely on hazardous pesticides (SPRC, 2003).

More attention is needed to reduce the risks associated with pesticide use in schools, from school facility managers, school boards, state level policy makers and parents and teachers. Each has a role to play, and accordingly, we recommend the following steps:

For State Policy Makers:

- ◆ The Legislature should fully fund and implement Oregon's Pesticide Use Reporting System.
- ◆ ODA should work with other agencies to ensure that school officials understand their responsibility under the state's pesticide use reporting system (once it is funded and functioning).
- ◆ State agencies – including the Departments of Health, Education and Agriculture – should work together to develop and provide training, technical assistance, incentives and materials to promote pest prevention, IPM practices and least-toxic pest management methods in Oregon schools. Agencies should also work with and involve experts from OSU Extension Service.
- ◆ The Legislature should consider prohibiting the use of pesticides in schools that are associated with cancer, reproductive and developmental effects, hormone disruption and nervous system toxicity.
- ◆ The Department of Education should encourage schools to develop pest control policies that rely on IPM and that lead to a reduction in pesticide use.

For School Managers and Decision-Makers:

- ◆ School officials should eliminate the use of pesticides that are acutely toxic or are linked to an increased risk of cancer, reproductive harm, endocrine disruption, and/or neurotoxicity (a useful resource for understanding which pesticides are linked to these health problems can be found at Pesticide Action Network Pesticides Database, <http://data.pesticideinfo.org/Index.html>).
- ◆ School officials should ensure that their districts develop and implement a pest control policy that requires least-toxic pest management.
- ◆ School officials should seek out pest control companies that rely on IPM and who understand the need to avoid pesticide use whenever possible. School officials and managers should shift their focus from cheaper, short-term pest control practices to a long-term management plan, which may require initial investment, but has been shown to be more cost-effective over time. For example, instead of focusing on the lowest-bid system for choosing a pest control contractor, schools should prefer contractors who adhere to least-toxic pest control practices.

For Parents, Teachers and Students:

- ◆ Ask your school district to implement the recommendations above.
- ◆ Request information from your school about pesticide use.
- ◆ Urge school managers to eliminate the use of highly toxic pesticides and adopt least-toxic pest management strategies.

By adopting a cautious approach, schools can reduce or even eliminate these risks altogether using simple, low-cost methods such as Integrated Pest Management. With proper training, planning, and effective communication among affected parties, these methods can prevent pest problems, reduce the need for pesticide applications, act as an educational tool for students, and greatly improve the quality of the school environment.

References

California E.P.A., Department of Pesticide Regulation. Medical Toxicology Branch. 1996. Summary of toxicology data: Dicamba. <http://www.cdpr.ca.gov/docs/toxsums/toxsumlist.htm>

De Roos, AJ, et. al., 2003. Integrative assessment of multiple pesticides as risk factors for non-Hodgkin's lymphoma among men. *Occupational and Environmental Medicine*. 60: E11.

Guillette, Elizabeth, et. al., 1998. "An Anthropological Approach to the Evaluation of Preschool Children Exposed to Pesticides in Mexico," *Environmental Health Perspectives*, Vol. 106, No. 6 (June 1998), pgs. 347-353.

Karel, Billie, et. al., 2003. "Clean Schools, Safe Kids: Striving for Safer Pest Management in North Carolina Public Schools." Agricultural Resources Center and Pesticide Education Project.

McDuffie, Helen H., et.al, 2001. Non-Hodgkin's lymphoma and specific pesticide exposures in men: cross-Canada study of pesticides and health. *Cancer Epidemiol Biomarkers & Prevention*. 10(11):1155-63.

National Academy of Sciences, 1993. "Pesticides in the Diets of Infants and Children." National Academy Press, Washington, D.C.

National Research Council, 1993. "Soil and Water Quality: An Agenda for Agriculture." National Academy Press, Washington D.C.

Ontario College of Family Physicians, 2004. "Pesticides Literature Review." Toronto, Ontario, Canada.

Oregon Department of Agriculture (ODA), 2004. "Pesticide Use in Schools (Urban Pesticide Use/Integrated Pest Management)," Pesticides Division, ODA, January 2004.

Pesticide Action Network (PAN) Pesticides Database, 2005. See <http://data.pesticideinfo.org/Index.html>

Reigart, J.R., and J.R. Roberts, 1999. "Recognition and Management of Pesticide Poisonings." U.S. Environmental Protection Agency, Washington D.C.

School Pesticide Reform Coalition (SPRC) and Beyond Pesticides, 2003. "Safer Schools: Achieving a Healthy Learning Environment Through Integrated Pest Management." Washington, DC.

Schettler, Ted, et.al., 1999. "Generations At Risk: Reproductive Health and the Environment." The MIT Press, Cambridge, MA.

Seattle Public Utilities, 2002. "ProIPM for the Landscaping Professional" The Green Gardening Program, a collaborative effort of Seattle Tilth, Washington Toxics Coalition, and WSU Cooperative Extension, King County. Reprinted 2/02.

U.S. E.P.A., 2005. See "About Pesticides" on EPA's Website at <http://www.epa.gov/pesticides/about/index.htm>

Washington Department of Ecology, 1999. "Calculating the True Costs of Pest Control," Publication #99-433, Hazardous Waste and Toxics Reduction Program, Olympia, WA.

APPENDIX I: Health Effects of Pesticides Used in Oregon Schools

(only pesticides reported by 2 or more school districts are listed here)

Pesticide Active Ingredient	Schools Reporting Use	Long-term Health Risks
2,4-D	37	Suspected endocrine disruptor
Atrazine	2	Possible carcinogen
Bromacil	3	Possible carcinogen
Bromadiolone	2	Highly acutely toxic
Chlorophacinone	2	Highly acutely toxic
Cyfluthrin	6	Neurotoxic; suspected endocrine disruptor
Dicamba	14	Possible carcinogen
Dichlobenil	12	Possible carcinogen
Diuron-bromacil	2	(unknown)
Ferric sulfate	2	(unknown)
Fipronil	6	Possible carcinogen; neurotoxic
Glyphosate	53	Some studies link glyphosate exposure to non-Hodgkins lymphoma and increased risk of miscarriage*
Hydramethylnon	3	Possible carcinogen; considered reproductive toxin by state of California
Isoxaben	2	Possible carcinogen
Malathion	2	Possible carcinogen; neurotoxic; suspected endocrine disruptor
MCPA	3	Possible carcinogen
MCPP/Mecoprop	8	Possible carcinogen
Mineral oil	2	
Oryzalin	4	Likely carcinogen
Oxadiazon	3	Known carcinogen by state of California
Pendimethalin	2	Possible carcinogen
Permethrin	4	Possible carcinogen; suspected endocrine disruptor
Phenothrin	2	Suspected endocrine disruptor
Propoxur	2	Probable carcinogen
Pyrethrins	2	Possible carcinogen
Simazine	2	Possible carcinogen

*Note: Health effects data from PAN Database (*Glyphosate information from Journal of Pesticide Reform Herbicide Factsheet, Winter 2004).*

APPENDIX II: Integrated Pest Management Resources

- ♦ **The U.S. Environmental Protection Agency** has a website with lots of great resources for schools, including links to many other sites.

<http://www.epa.gov/pesticides/ipm/>

- ♦ **California School IPM Program.** This website, sponsored by the California Department of Pesticide Regulation, includes a multitude of useful resources for schools, including a School IPM Guidebook, Information on Pest Prevention, Maintenance Practices & Facility Design, and pest-specific control tactics.

<http://www.cdpr.ca.gov/cfdocs/apps/schoolipm/main.cfm>

- ♦ **The IPM Institute of North America** is an independent non-profit organization formed in 1998 to foster recognition and rewards in the marketplace for goods and service providers who practice IPM. Schools can download a document that lists more than 700 IPM practices for use in school buildings and on school grounds, as well as more than 250 resources for information on how to implement those practices, model legislation, school pest management practice surveys, IPM curricula and project ideas for teachers.

<http://www.ipminstitute.org/>

- ♦ Sponsored by **North Carolina State University College of Agriculture and Life Sciences**, this easy-to-use manual provides an excellent resource for schools interested in implementing an IPM program.

http://ipm.ncsu.edu/urban/cropsci/schoolipm/schoolipm_manual.pdf

- ♦ **Beyond Pesticides**, a not-for-profit organization, has lots of information of IPM in schools on its website, including information on how schools can save money with IPM.

www.beyondpesticides.org/schools/index.htm