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ABSTRACT

This document consists of a collection of fact sheets about the use of pesticides in schools and how to reduce it. The sheets are: (1) "Alternatives to Using Pesticides in Schools: What Is Integrated Pest Management?"; (2) "Health Effects of 48 Commonly Used Pesticides in Schools"; (3) "The Schooling of State Pesticide Laws--2002 Update: A Review of State Pesticide Laws Regarding Schools" (Kagan Owens and Jay Feldman); (4) "Ten Myths behind Pesticide-Dependent Pest Management in Schools"; and (5) "Schools Save Money with Integrated Pest Management." (EV)

Fact Sheets on Pesticides in Schools

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Alternatives to Using Pesticides in Schools

What is Integrated Pest Management?

A Beyond Pesticides/NCAMP Fact Sheet

A strong integrated pest management (IPM) definition and policy is one of the best ways to minimize or eliminate children's exposure to pesticides while at school. IPM is a term that is used loosely with many different definitions and methods of implementation. IPM can mean virtually anything the practitioner wants it to mean. Beware of chemical dependent programs masquerading as IPM.

Integrated Pest Management (IPM) is a program of prevention, monitoring, and control which offers the opportunity to eliminate or drastically reduce pesticides in schools, and to minimize the toxicity of and exposure to any products which are used. Education, in the form of workshops, training sessions and written materials, is an essential component of an IPM program - for everyone from administrators, maintenance personnel, cafeteria staff and nurses to parents and students.

IPM is a managed pest management system that: (a) eliminates or mitigates economic and health damage caused by pests; (b) minimizes the use of pesticides and the risk to human health and the environment associated with pesticide applications; and, (c) uses integrated methods, site or pest inspections, pest population monitoring, an evaluation of the need for pest control, and one or more pest control methods, including sanitation, structural repairs, mechanical and living biological controls, other non-chemical methods, and, if nontoxic options are unreasonable and have been exhausted, least toxic pesticides.

The Six IPM Program Essentials

Monitoring. This includes regular site inspections and trapping to determine the types and infestation levels of pests at each site.

Record-Keeping. A record-keeping system is essential to establish trends and patterns in pest outbreaks. Information recorded at every inspection or treatment should include pest identification, population size, distribution, recommendations for future prevention, and complete information on the treatment action.

Action Levels. Pests are virtually never eradicated. An action level is the population size which requires remedial action for human health, economic, or aesthetic reasons.

Prevention. Preventive measures must be incorporated into the existing structures and designs for new structures. Prevention is and should be the primary means of pest control in an IPM program.

Tactics Criteria. Under IPM, chemicals should be used only as a last resort only, but when used, the least-toxic materials should be chosen, and applied to minimize exposure to humans and all non-target organisms.

Evaluation. A regular evaluation program is essential to determine the success of the pest management strategies.

Least Toxic Pesticides include:

(a) boric acid and disodium octobrate tetrahydrate,
(b) silica gels,
(c) diatomaceous earth,
(d) nonvolatile insect and rodent baits in tamper resistant containers or for crack and crevice treatment only,
(e) microbe-based pesticides,
(f) pesticides made with essential oils (not including synthetic pyrethroids) without toxic synergists, and
(g) materials for which the inert ingredients are nontoxic and disclosed.

The term 'least toxic pesticides' does not include a pesticide that is

(a) determined by EPA to be a possible, probable, or known carcinogen, mutagen, teratogen, reproductive toxin, developmental neurotoxin, endocrine disrupter, or immune system toxin;
(b) a pesticide in EPA's toxicity category I or II; and,
(c) any application of the pesticide using a broadcast spray, dust, tenting, fogging, or baseboard spray application.

Decision-making Process. Create an IPM decision-making process that draws on accurate, timely information to make pest prevention and management decisions. Determine the needs of the site, and set "action thresholds;" levels of pest populations at which remedial action is necessary. This will vary depending on the site - what type of structure it is, who is using it, and how it is being used. For instance, cafeterias will need to be more pests free than the equipment room. This decision should be made with someone knowledgeable about the pest needing control and the risks of pesticides, someone who does not have a financial interest in selling a pesticide product.

Monitor. Implement a monitoring program designed to provide accurate, timely information on pest activity - to establish whether there is in fact a pest problem and to identify its causes. Implement a schedule and a plan for monitoring pest populations and the success of pest control efforts. This will help determine acceptable pest population levels, effective reduction measures, and breach of the action threshold. The best way to monitor for many pests, like cockroaches, is with sticky traps. They should be placed throughout the school structures at many different levels. Set the traps for 24 hours, and then record your results. The traps should be used on a regular schedule, such as monthly.

Pest Prevention Practices. Use practices that eliminate the need for hazardous pesticides - changing the conditions to prevent problems, including occupant education, careful cleaning, pest-proof waste disposal, and structural maintenance. Learn about what the specific pest needing control needs to live - food, water, and habitat. Reduce the sources of food and water. For instance, always clean up food and food areas, place food in airtight, sealed containers, dispose of food and food wrappers in sealed garbage containers, repair leaky pipes and faucets, caulk up cracks and crevices, and eliminate clutter whenever possible. Remember that it can take some time for these methods to be effective.

Mechanical, Biological, and Least Toxic Controls. If all other methods have failed, and monitoring shows that your pest population is still above your action thresholds, use mechanical traps, such as sticky traps, and biological controls, such as pheromones and parasitic insects. Then, and only then, should you consider spot treatment of the least toxic pesticides. You must weigh the risks associated with the use of a pesticide against the problems caused by the pest. Consider your options carefully, being mindful not to blindly jump at a solution that may have risks without first collecting the facts.

If you must use a pesticide, you should the least toxic pesticide available. Boric acid, formulated from a natural mineral, is an effective ant and cockroach stomach poison. When properly applied, it has a relatively low toxicity compared to other pesticides. Further, it does not evaporate into the indoor air of the structure, unlike many other pesticides. Look for boric acid that has less than one percent of inert ingredients, therefore you have a better idea of what you are applying and its risks than with most other pesticides. While boric acid is somewhat slower acting than other materials, it is highly effective over a long period of time. But remember, all pesticides are poisones designed to kill, and should be handled carefully and with respect. Boric acid should be applied only in areas where it will not come in contact with people - cracks and crevices, behind counters, and in baseboards. Applicators should wear protective clothing, gloves, and a filter mask.

Also see **Schools Save Money with IPM.**

Health Effects of 48 Commonly Used Pesticides in Schools

A Beyond Pesticides/NCAMP Fact Sheet

Pesticide	Cancer	Reproductive Effects	Neurotoxicity	Kidney / Liver Damage	Sensitizer / Irritant	Birth Defects
Insecticide						
Acephate	C	X[1]	X[2]		X[1]	
Allethrin			X[1]	X[1]	X[1]	
Avermectin		X[1]	X[1]		X[1]	X[1]
Bendiocarb			X[2]		X[1]	
Bromacil	C			X[1]	X[3]	
Chlorpyrifos		X[4]	X[2]		X[1]	X[4]
Cyfluthrin		X[1]	X[1]	X[1]	X[1]	
Cypermethrin	C		X[1]	X[1]	X[1]	
Diazinon		X[5]	X[2]	X[5]	X[1]	
Dichlorvos	C, 2B		X[2]	X[1]	X[1]	
Fenoxycarb	B2			X[1]	X[1]	
Fenvalerate			X[1]		X[1]	
Hydramethylnon	C	X[2]		X[1]	X[1]	X[2]
Isophenfos			X[2]		X[1]	
Lamda Cyhalothrin	D		X[1]		X[1]	
Phenothrin						
Piperonyl butoxide (a synergist)	C	X[5]	X[5]	X[5]	X[6]	
Prometon	D					
Propetamphos			X[2]			
Propoxur	B2	X[1]	X[2]	X[1]		X[1]
Pyrethrin		X[1]	X[1]	X[1]	X[1]	
Tetramethrin	C					
Trichlorfon		X[1]	X[2]	X[1]	X[1]	X[1]
Herbicides						
Atrazine	C, 2B		X[1]	X[1]	X[1]	X[7]
Bensulide			X[3]	X[8]	X[1]	
2,4-D	X[9]	X[1]	X[1]	X[1]	X[1]	X[1]
DSMA			X[10]		X[7]	
Dacthal	C			X[1]	X[3]	
Dicamba	D	X[1]	X[1]	X[1]	X[1]	
Diquat Dibromide		X[3]	X[3]	X[3]	X[3]	X[3]
Endothall		X[1]		X[1]	X[1]	
Glyphosate		X[3]		X[1]	X[3]	
Isoxaben	C			X[3]		X[3]
MCPA		X[1]	X[1]		X[1]	X[1]
MCPP		X[1]	X[11]	X[1]	X[1]	X[1]
MSMA			X[13]		X[13]	
Pendimethalin	C	X[1]		X[1]	X[1]	
Pronamide	B2	X[3]		X[3]	X[1]	
Siduron					X[13]	

Health Effects of 48 Commonly Used Pesticides in Schools

A Beyond Pesticides/NCAMP Fact Sheet

Pesticide	Cancer	Reproductive Effects	Neurotoxicity	Kidney / Liver Damage	Sensitizer / Irritant	Birth Defects
Triclopyr	D	X[3]		X[3]	X[3]	
Trifluralin	C	X[1]		X[1]	X[3]	
Fungicides						
Benomyl	C	X[12]	X[5]	X[1]	X[1]	X[14]
Chlorothalonil	X[13]	X[3]	X[5]	X[1]	X[1]	
Maneb	B2	X[1]	X[1]	X[1]	X[1]	X[1]
PCNB	C			X[1]	X[1]	X[5]
Sulfur					X[3]	
Triadimefon	C	X[14]	X[5]	X[1]		X[14]
Ziram		X[1]	X[1]		X[1]	X[1]
TOTAL	21 probable or possible	26	31	31	41	16

B2 = EPA weight-of-evidence category, "probable human carcinogen, sufficient evidence in animals and inadequate or no evidence in humans."
C = EPA weight-of-evidence category, "possible human carcinogen" rating.
D = EPA weight-of-evidence category, "not classifiable as to human carcinogenicity," usually due to inadequate data.
2B = International Agency for Research on Cancer, World Health Organization (IARC) category, the agent (mixture) is possibly carcinogenic to humans.
X = Adverse effect demonstrated.

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[1] Extension Toxicology Network (EXTOXNET) Pesticide Information Profiles, ace.orst.edu/info/extoxnet/ghindex.html.
[2] California Department of Pesticide Regulation.
[3] EPA's Office of Pesticide Program Reregistration Eligibility Decision (RED) Factsheet, www.epa.gov/oppsrrd1/REDs/.
[4] EPA's Office of Prevention, Pesticides and Toxic Substances, Revised Risk Assessments on Chlorpyrifos (Released 8/16/00).
[5] Environmental Defense Fund, Scoreboard Database, www.scorecard.org/chemical-profiles/.
[6] Farm Chemicals Handbook, 2000.
[7] New Jersey Department of Health and Senior Services, Hazardous Substances Factsheet.
[8] Human Health Risk Assessment for Bensulide, EPA's OPP Health Effects Division.
[9] Based on National Cancer Institute epidemiological evidence.
[10] Material Data Safety Sheet for DSMA, www.horizononline.com/MSDS_Sheets/195.txt.
[11] National Library of Medicine, TOXNET, Hazardous Substances Database, http://toxnet.nlm.nih.gov/.
[12] Classified under California Department of Pesticide Regulation's Proposition 65.
[15] EPA classifies chlorothalonil as a "Likely" carcinogen, under proposed EPA weight-of-evidence category, because the available tumor effects and other key data are adequate to convincingly demonstrate carcinogenic potential for humans.

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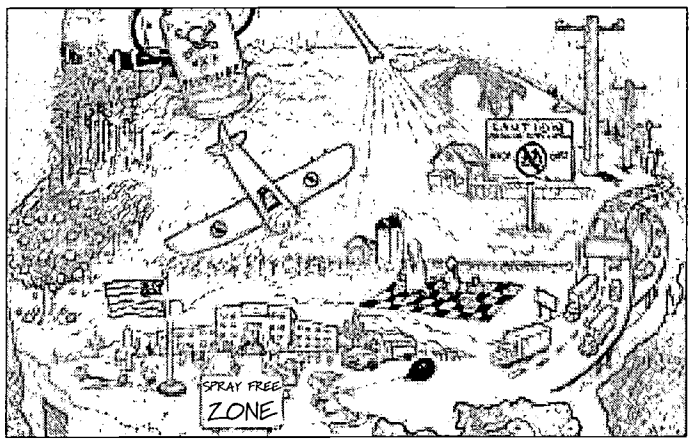
The Schooling of State Pesticide Laws – 2002 Update

A review of state pesticide laws regarding schools

By Kagan Owens and Jay Feldman

Beyond Pesticides surveyed state pesticide laws regarding pesticide use in schools in 1998 and 2000. Since the report's publication in 2000, six states[1] have passed laws that address one or more of the following five evaluation criteria: (i) restricted spray (buffer) zones to address chemicals drifting into school yards and school buildings; (ii) posting signs for indoor and outdoor pesticide applications; (iii) prior written notification for pesticide use; (iv) prohibiting when and where pesticides can be applied; and, (v) requirements for schools to adopt an integrated pest management (IPM) program. These five criteria are essential ingredients in a program to protect children from pesticides used in schools.



Although there continues to be growing movement on this issue, including pending federal legislation, the *School Environment Protection Act*, pesticide use policies and practices remain deficient in the protection of children. Without minimum federal standards, the protection provided children is uneven and inadequate across the country. Just two-thirds of the states, or 33 states, have adopted pesticide acts and regulations that address the protection of children by specifically focusing on pesticide use in, around or near schools. Of these, only 24 states address indoor use of pesticides.[2]

Beyond Pesticides' survey of state laws regarding pesticide use in schools shows that:

- 7 states recognize the importance of controlling drift by restricting pesticide applications in areas neighboring a school;
- 16 states require posting of signs for indoor school pesticide applications and 25 states require posting of signs for pesticide application made on school grounds;
- 21 states require prior written notification to students, parents, or staff before a pesticide application is made to schools;
- 10 states restrict when or what pesticide may be applied in schools; and
- 16 states recommend or require schools to use IPM.

These laws are instrumental in improving protections from school pesticide use. However, to the extent that these laws do not prohibit the use of toxic pesticides around children and do not treat pesticide exposure as a public health issue by providing universal prior notification of pesticide use, they all to some degree compromise the protection of children. Massachusetts is the only state in the nation to prohibit the use of the most dangerous pesticides in and around schools. Although the Massachusetts' law has some weaknesses, it should be considered, along with Maryland's and Pennsylvania's school pesticide laws, a model for other states.

Restricted spray (buffer) zones around school property

Buffer zones can eliminate exposure from spray drift on to school property. In order to adequately protect against drift, buffer zones should, at a minimum, be established in a 2-mile radius around the school's property and be in effect at all times of the day. Aerial applications should have a larger buffer zone, at least 3 miles encircling the school. Seven states have recognized the importance of controlling drift by restricting pesticide applications in areas neighboring a school that range from 300 feet to 2 1/2 miles.

Posting notification signs for indoor and outdoor pesticide applications

Posted notification signs warn those at the school when and where pesticides have been or are being applied. It is important to post signs for indoor and outdoor pesticide applications because of the extensive period of time students and school employees spend at school. Signs posted days before, rather than simply at the time or just after a pesticide application, are more protective. Prior posting may enable people to take precautionary action. Because of the residues left behind after an application, signs should remain posted for 72 hours.

This report is the third edition of the report released in Pesticides and You, "The Schooling of State Pesticide Laws – 2000" (volume 20, no. 2, 2000) and "The Schooling of State Pesticide Laws" (volume 18, no. 3, 1998).

How States Around the Country Protect Children From Pesticide Exposure in Schools

State	Buffer Zones	Posting Signs[1]	Prior Notification[2]	IPM[3]	Prohibition of Use
Alaska		Indoor & outdoor, post sign, remain for 24 hours. When school out of session & open to public, post notification sign 24 hours prior to application.	Parent & staff registry or universal notification, school decision, 24 hour notice.		Children prohibited from entering treated area for 24 hours, or the reentry interval stated on the label.
Alabama	Aerial application, 400 feet.				
Arizona	Ground & aerial application, 1/4 mile, certain odoriferous & highly toxic pesticides.	Indoor & outdoor, school district establish posting requirements.	Parent & staff, universal 48 hour notice.		
California		Indoor & outdoor, post sign 24 hours prior to application, remain 72 hours.	Parent & staff registry, 72 hour notice.	Recommends.	
Connecticut		Outdoor, post sign, no specifics on time to remain posted.	Parents & staff registry, 24 hour notice.	Recommends.	Pesticide applications prohibited during operating hours.
Florida		Outdoor, post sign beginning of application, no specifics on time to remain posted.		Requires.	
Georgia		Indoor, prior posting, remain 24 hours. Outdoor, prior posting, remain until the following day.			
Illinois		Outdoor, post sign, remove following day.	Parent registry or universal notification, school decision, 48 hour notice.	Requires.[4]	
Kentucky		Outdoor, post sign immediately following application, remain until the following day.	Parent & staff registry, 24 hour notice.	Requires.	
Louisiana	Aerial application, 1000 feet, during school hours.		Parent registry, medical verification required, no time specified.	Requires.	Applications of restricted use pesticides, entry restricted for 8 hours after application.
Maine		Outdoor, post prior to application, remain 48 hours.	Parent & staff can request notification, outdoor applications.[5]	Recommends.	
Maryland		Indoor & outdoor, "in-school notification." Outdoor, post sign at time of application, remain 48 hours.	Parent & staff, elementary school, universal 24 hour notice, secondary school, registry, 24 hour notice.	Requires.	
Massachusetts	Aerial crop application, 150 feet.	Indoor, post prior to application. Outdoor, post sign 48 hours prior to application, remain 72 hours.	Parent & staff, universal notification, outdoor applications. Parent & staff registry, indoor application, no time specified.	Requires.	Pesticide use prohibited when children present. Outdoor, pesticides that are known, likely or probable carcinogens, contain a "List I" inert ingredient or for aesthetic reason alone are prohibited from use. Indoor, certain pesticides are prohibited.
Michigan		Indoor, post sign after application, remain 48 hours. Outdoor, post sign after application, remain 24 hours.	Parent registry, 24 hour notice.	Requires.[6]	Indoor, spray or aerosol insecticide, entry restricted for 4 hours after application. Outdoor, prohibits spray insecticide, 100 ft outside occupied area.

[1] Five states require posting notification signs for outdoor lawn applications: Colorado, Indiana, Iowa, Ohio, and Vermont. These states are not included because this is the only requirement the states have adopted regarding schools.
[2] Does not include provisions regarding universal notification of the school's pest management program at the start of the school year or provisions requiring schools to provide written notice after applications have taken place.
[3] Does not include states (like Hawaii, Indiana, Oklahoma, South Carolina, and Tennessee) that have developed materials on school IPM. The section only applies to the states that have adopted acts or regulations requiring or recommending schools adopt IPM.
[4] Illinois requires IPM for structural pest management only.
[5] Maine's law allows for individuals to request to be notified of an outdoor application by contacting the school directly and setting up an agreed upon prenotification time. Law does not require schools to establish a formal registry.
[6] Michigan requires IPM plans be developed for indoor pest management only.

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How States Around the Country Protect Children From Pesticide Exposure in Schools

State	Buffer Zones	Posting Signs[1]	Prior Notification[2]	IPM[3]	Prohibition of Use
Minnesota			Parent registry, notification at "reasonable" time before application.	Requires.	
Montana		Indoor, post sign at time of application, remain "until dry."		Recommends.	
New Hampshire	Aerial application, during commuting hours & outdoor activity in sensitive areas.	Outdoor, post sign, remain 24 hours.			Pesticides cannot be applied "where exposure may have an adverse effect on human health."[7]
New Jersey	Ground & aerial gypsy moth application, during commuting hours, 2 miles grade school, 2 1/2 miles high school. Aerial application, 300 feet.	Indoor, permanent posting at central bulletin board, states next application. Outdoor, post sign at start of application, remain 24 hours.	Parent & staff registry, no time specified.		Pesticide application prohibited during normal school hours or when area will be occupied within time for product to dry.
New Mexico		Indoor & outdoor emergency applications only, no specifics on time.	Parent registry, no time specified. Parent and staff universal notification, child care center, 48 hour notice.		Prohibits use of certain pesticides when area occupied or will be for next 6 hours. Licensed childcare centers use of pesticides prohibited when children on premises.
New York		Indoor & outdoor, daycare center, post sign 48 hours prior to application. Outdoor, post sign, remain 24 hours.	Parent & staff registry, 48 hour notice.	Recommends.	
North Carolina	Aerial application, 300 feet, when school occupied.				
Pennsylvania		Indoor & outdoor, post sign 72 hours prior to application, remain 48 hours.	Parent registry or universal notice, 72 hour notice. Staff, universal 72 hour notice.	Requires.	Prohibits pesticide applications when students will be present in the school building or on school grounds for seven hours following the application.
Rhode Island		Outdoor, post sign, remain 72 hours.	Parent & staff registry, 24 hour notice.		
Texas		Indoor, post sign 48 hours prior to application, no specifics on time to remain posted.	Parent registry, indoor & perimeter application, no time specified.	Requires.	Pesticides are grouped into lists. No indoor application of certain Green List when students in area. Other Green List & Yellow & Red Lists, restrict entry for 12 hours after application. Outdoor applications, Green List: students must be 10 feet away, Yellow List: 10 feet away, 12 hours restricted entry, Red list: 50 feet away, 12 hour restricted entry.
Washington		Indoor & outdoor, post sign at time of application, remain posted for 24 hours.	Parent & staff registry or universal notice, 48 hour notice.[8]		
West Virginia		Indoor, day care center, post sign 24 hours prior to application, no specifics on time to remain posted.	Day care employees, automatic 24 hour notice, level 3 or 4 pesticide. Parent registry, schools & day care centers, 24 hour notice of level 3 or 4 pesticide.	Requires.	Pesticides are grouped into levels. Students & employees restrict entry for 4 hours after level 3 pesticide & 8 hours after level 4 pesticide.
Wisconsin		Indoor & outdoor, post sign at time of application, remain 72 hours.			
Wyoming		Indoor & outdoor, post sign 12 hours prior to application, remain 72 hours.	Parent & staff, universal prior notice.[9]		

[7] Although this language is open to interpretation, it is a stronger safety standard than contained in the *Federal Insecticide, Insecticide, Fungicide and Rodenticide Act* (FIFRA), which protects for "unreasonable adverse effects."

[8] Washington law states that a school "as a minimum, notifies interested parents or guardians of students and employees at least 48 hours prior to a pesticide application."

[9] Wyoming school pesticide notification act requires the pesticide applicator provide 72 hour prior notice to the school district, which is required to "further notify students, teachers and staff."

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Sixteen states require posting of signs for indoor school pesticide applications. Pennsylvania, the strongest state in this regard, requires posting warning signs at least 72 hours in advance of the application, while three states, California, Wisconsin and Wyoming, require that signs remain posted for 72 hours, the longest time frames among the states.

Twenty-five states have posting requirements when pesticide applications are made on school grounds. Pennsylvania requires sign posting 72 hours in advance of the application. New York and Massachusetts require signs be posted 48 hours prior to applications to school grounds and buildings. Five states require signs remain posted for at least 72 hours. Thirteen states require posting for both indoor and outdoor pesticide applications.

Prior written notification

Written notification prior to each pesticide use is a good way to make sure that *all* parents, children and staff are aware and warned. There are basically two types of notification – registries and universal, and modified systems that incorporates elements of both. Notification-based registries are a less effective means of notifying people and do not qualify as true right-to-know because of their limited scope. Requiring that individuals place themselves on registries affords only those who already know about toxic exposure the opportunity to be informed about pesticide use in the school. Registries also tend to be more costly and time consuming for the school because of the time associated with list management. Prior notification should be 72 hours in advance to make sure the information has been received, to get further information regarding the pesticide, and to make arrangements to avoid the exposure, if necessary.

Twenty-one states have requirements to notify parents or school staff in writing before a pesticide application is to occur. Of these, ten states have provisions for universal notification prior to each pesticide application.[3] Nineteen states have provisions that establish a registry, allowing individuals to sign up for prior notification.[4] The widest range of notification activities, requiring posting signs for indoor and outdoor applications and providing prior notification of a school pesticide application, are met by only eleven states.

Prohibitions on use

Limiting when and what pesticides are applied in and around schools is important to the reduction of pesticide exposure. Pesticides should never be applied when students or staff are, or likely to be, in the area within 24 hours of the application. Ten states restrict the type and/or timing of pesticides that may be used in a school. In reality, certain types of pesticides, such as carcinogens, endocrine disruptors, reproductive toxins, developmental toxins, neurotoxins and pesticides listed by EPA as a toxicity category I or II pesticide should never be used around children. Massachusetts is the only state that bans the use of certain pesticides by schools. Alaska has the longest re-entry restrictions, requiring that the area treated with certain pesticides remain unoccupied for 24 hours after the application.

Integrated pest management

A good integrated pest management (IPM) program can eliminate the unnecessary application of synthetic, volatile pesticides in schools. The main elements of a good IPM program include: 1) monitoring to establish whether there is a pest problem, 2) identifying the causes of the pest problem, 3) addressing the cause by changing conditions to prevent problems, 4) utilizing pest suppression techniques, if necessary, that are based on mechanical and biological controls, and 5) only after non-toxic alternatives have been tried and exhausted, use the least toxic pesticide.

Sixteen states address IPM in their laws, but only eleven of those require that schools adopt an IPM program. Unfortunately, IPM is a term that is used loosely with many different definitions. More and more, we hear pest control programs inaccurately described as IPM. Of the sixteen states, California, Illinois, Maryland, Massachusetts and Minnesota, have comprehensive definitions of IPM, and allow only the least toxic pesticide to be used as a last resort. It is important to incorporate a strong IPM definition into policies and laws to achieve effective, least-hazardous pest management.

Conclusion

Raising the level of protection across the nation to meet the highest possible standard of protection for children is essential. Where a state offers protection not provided by your state, advocate for it. Where policies exist, make sure that they are enforced. Enforcement of existing pesticide laws is also critical and often the most difficult phase of community-based efforts. Both the adoption of laws and ensuring their enforcement once adopted, require vigilant monitoring and public pressure. Exemptions that waive notification requirements before or after pesticide use, such as during school vacations, undermine protection.

Parents and community members can help school districts improve their pest management practices by contacting district officials and encouraging them to implement an IPM and notification program. School administrators will be more conscious of their pest management policy if they know parents are concerned and tracking their program.

For information on state pesticide laws, school district policies, and tools on how to get such policies at the federal, state and local level adopted, please contact Beyond Pesticides or see www.beyond pesticides.org.

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1 The six states that have passed school pest management laws since "The Schooling of Pesticide Laws- 2000" include Alaska, Kentucky, Pennsylvania, Rhode Island, Wisconsin, and Wyoming.

2 States that "address" indoor use of pesticides are based on whether the state requires schools post notification signs for indoor pesticide applications, provide prior notification of an indoor pesticide applications prohibit the use of certain pesticides in school buildings or recommend or require integrated pest management.

3 This includes the four states that give the schools the choice of providing notice either via a registry or universal notice, the four states that have provisions for both registries and universal notice, and the two states that specifically require schools provide universal prior notification.

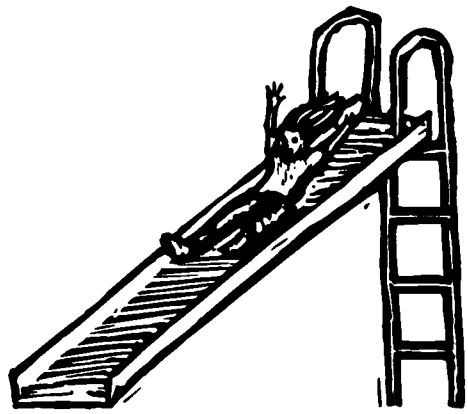
4 This includes the four states that give the schools the choice of providing notice either via a registry or universal notice, the four states that have provisions for both registries and universal notice, and the 12 states that specifically require schools maintain a registry.

Ten Myths Behind Pesticide-Dependent Pest Management in Schools

Debunking opponents to school integrated pest management, pesticide bans and notification programs.

The pro-pesticide lobby has engaged in an all-out effort to convince local school districts that pesticides can be used safely in schools and therefore fully integrated into school pest management programs. One such group, Responsible Industry for a Sound Environment (RISE), distributed a letter containing misleading and inaccurate information on school pesticide use to 25,000+ school facility managers around the country.

To halt the pro-pesticide lobby from continuing to undercut community activists' efforts to reduce or eliminate pesticide use in favor of alternative strategies, Beyond Pesticides/NCAMP has developed this fact sheet as a guide to better understanding the issues. Notification of pesticide applications and elimination of toxic pesticide use where possible can be accomplished in our schools. Invalidate the pro-pesticide lobby's top ten myths with the *facts*.



MYTH #1

Pesticides are a vital ingredient to an Integrated Pest Management (IPM) program.

FACT #1:

Those who argue that Integrated Pest Management (IPM) requires an ability to spray pesticides immediately after identifying a pest problem are not describing IPM. IPM is pest management that is sensitive to the health of students, school staff and the environment. Pesticide use is unnecessary because safer alternatives can successfully control pest problems. The goal of an IPM program is to minimize the use of pesticides and the associated risk to human health and the environment while controlling a pest problem. IPM does this by utilizing a variety of methods and techniques, including cultural, biological and structural strategies to control a multitude of pest problems. (*See box on page 16*).

Essential to the control of a pest problem are solutions based on preventing pest outbreaks to occur in the first place. For example, improving a school's sanitation can eliminate cockroaches and ants. Many techniques are relatively simple, such as mulching to prevent weeds or caulking cracks and screening openings where insects and rodents can enter a building. Constant monitoring ensures that pest buildups are detected and suppressed before unacceptable outbreaks occur.

Conventional pest control tends to ignore the causes of pest infestations and instead rely on routine, scheduled pesticide applications. Pesticides are often temporary fixes, ineffective over the long term. Most common pests are now resistant to many insecticides. For effective pest control, it is absolutely necessary to identify the source of the problem, determine why the pest is present and modify its habitat. For example, since weeds tend to like soils that are compacted, the solution is not the temporary control achieved by killing them, but the adoption of practical strategies to make the soil less attractive to the weeds.

Alternatives to conventional hazardous pesticides are being implemented in over 100 school districts around the country and, thus, prove that alternatives work. Non-toxic and least toxic control products are a major growth area and new materials and devices are increasingly available in the marketplace.

MYTH #2:

Pesticides pose no risk to the health of children.

FACT #2

Student and staff poisoning at schools is not uncommon. Adverse health effects, including nausea, dizziness, respiratory problems, headaches, rashes, and mental disorientation, may appear even when a pesticide is applied according to label directions. Low levels of pesticide exposure can adversely affect a child's neurological, respiratory, immune and endocrine system. Of the 48 commonly used pesticides in schools, 22 can cause cancer, 26 can adversely affect reproduction, 31 are nervous system poisons and 16 can cause birth defects.[1]

The General Accounting Office (GAO) in 2000 documented over 2,300 reported pesticide poisonings in schools between 1993 and 1996.[2] Because most of the symptoms of pesticide exposure, from respiratory distress to difficulty in concentration, are common in school children and may be assumed to have other causes, it is suspected that pesticide-related illness is much more prevalent.

EPA and Dow AgroSciences agreed in June 2000 to phase-out Dursban (chlorpyrifos), one of the most commonly used insecticides in schools, because of its high risks to children, even if used according to the label directions. The product has been marketed for the past 30 years with claims that it could be used safely. Even though EPA and the manufactures of Dursban agreed to phase-out its use

Integrated Pest Management (IPM) is a managed pest management system that: (a) eliminates or mitigates economic and health damage caused by pests; (b) uses integrated methods, site or pest inspections, pest population monitoring, an evaluation of the need for pest control and one or more pest control methods, including sanitation, structural repairs, mechanical and biological controls, other non-chemical methods, and, if nontoxic options are unreasonable or have been exhausted, least toxic pesticides.

Least toxic pesticides include: boric acid and disodium octobrate tetrahydrate, silica gels, diatomaceous earth, nonvolatile insect and rodent baits in tamper resistant containers or for crack and crevice treatment only, microbe-based insecticides, biological, living control agents, and materials for which the inert ingredients are nontoxic and disclosed. The term 'least toxic pesticides' does not include a pesticide that is determined by the EPA to be an acutely or moderately toxic pesticide, a probable, likely or known carcinogen, mutagen, teratogen, reproductive toxin, developmental neurotoxin, endocrine disrupter, or immune system toxin, and any application of the pesticide using a broadcast spray, dust, tenting, fogging, or baseboard spray application.

in many settings, including schools, it can continue to be used until existing stocks are used up. The EPA chlorpyrifos announcement begins the process of getting high consumer and children exposure uses of Dursban off the market, but puts people at risk by not stopping its uses immediately.[3]

MYTH #3:

Without pesticides, pests pose a serious health and safety risk to children.

FACT #3:

The pro-pesticide lobby wants people to think that if we stop using toxic pesticides, our school buildings and lawns would be overcome by disease-carrying pests and weeds. However, this is not true. School pest problems can be effectively managed without toxic pesticides, as discussed in *fact #1*. Most insect and weed pests may be a nuisance, or raise aesthetic issues, but they do not pose a threat to children's health. Children should never be exposed to potentially harmful pesticides for this reason.

Increasingly the public is calling into question the use of pesticides for cosmetic results alone. The unleashing of these toxic chemicals into our environment for aesthetic gain is responsible for countless human suffering and untold environmental consequence. In the words of Rachel Carson, "How could intelligent beings seek to control a few unwanted species by a method that contaminated the entire environment and brought the threat of disease and death even to their own kind? Future generations are unlikely to condone our lack of prudent concern for the integrity of the natural world that supports all life."

Toxic pesticides and certain pests do pose a health risk to children,[4] which is why schools need to implement a comprehensive school IPM program. A school IPM program is established to prevent and manage pest problems, not to let pests run rampant.

MYTH #4:

School IPM programs are too costly for schools.

FACT #4:

According to the U.S. Environmental Protection Agency (EPA), "preliminary indications from IPM programs in school systems suggest that long term costs of IPM may be less than a conventional pest control program."[5] Because IPM focuses on prevention of the pest problem, and properly monitoring to determine the extent of the pest problem, school IPM programs can decrease the amount of money a school will spend on pest control in the long-term. Some economic investment is usually required at the outset of an IPM program. Short-term costs may include IPM training, purchasing new equipment, hiring an IPM coordinator, or making preliminary repairs to a school's buildings. Chemical-intensive methods only prove to be less expensive in the short-term. The long-term health of our children is not worth short-term economic savings that just do not add up over time.

A well-known example of school IPM is the Montgomery County, Maryland public schools. The IPM program in Montgomery County covers 200 sites and reduced pesticide use from 5,000 applications in 1985 to none four years later, saving the school district $1800 per school and $30,000 at the County's school food service warehouse.[6]

In Indiana, Monroe County Schools implemented an IPM program that decreased the school's pest management costs by $6,000 in two years. Pesticide use has reportedly dropped by 90% with the IPM program, and all aerosol and liquid pesticides have been discontinued.[7]

EPA has stated that no pesticide can be considered 'safe.'

At Vista de las Cruces School in Santa Barbara, California, pest management was contracted out with a pest control company for $1,740 per year for routine pesticide applications. After the school switched to an IPM program, their costs were reduced to a total of $270 over two years.

Albert Greene, Ph.D., National IPM Coordinator for the U.S. General Services Administration (GSA), has implemented IPM in 30 million square feet, approximately 7,000 federal buildings, in the U.S. capital area without spraying toxic in-

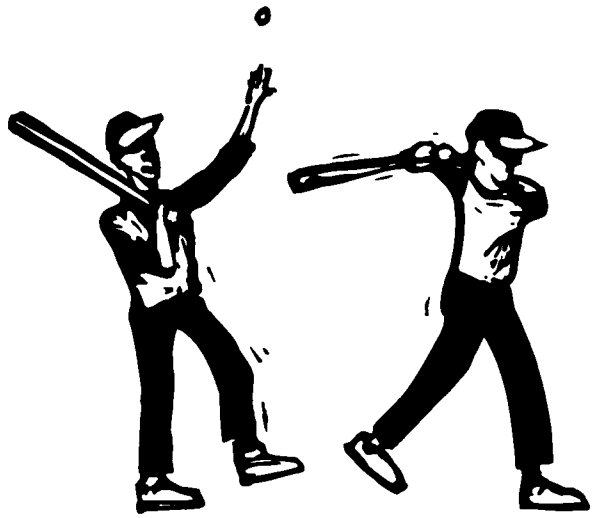
secticides. Dr. Greene states that IPM, "can be pragmatic, economical and effective on a massive scale."[8]

MYTH #5:

Pesticides are extensively tested and regulated. Before a pesticide product is approved for use, it must undergo over 120 government-mandated tests.

FACT #5:

Suggestions that pesticides in wide use have been subjected to full and adequate health and safety testing belies the widely acknowledged deficiencies in EPA's pesticide registration process. In addition, the safety standard in pesticide law allows elevated rates of disease under a risk assessment-based standard. As a result, EPA has stated that no pesticide can be considered 'safe.'"[9]



Pesticides products contain formulations of a number of different materials, including active and inert ingredients, as well as contaminants and impurities. Additionally, pesticides, when subject to various environmental conditions, break down to other materials, known as metabolites, which are sometimes more toxic than the parent material. So-called inert ingredients can be as or more toxic than the active ingredient – active ingredients in other pesticides, toxic chemicals, chemicals regulated under other legislation, or hazardous wastes, solvents, propellants, wetting agents, petrochemicals and synergists. Inerts, often petrochemicals like toluene or xylene, are generally the largest percentage of ingredients of a pesticide product. Despite this, inert ingredients are treated as trade secret information and not disclosed on product labels. Contaminants and impurities are often a part of the pesticide product and responsible for the product hazards. Dioxin and DDT have been identified as contaminants in pesticide products.

Existing pesticide use patterns and a deficient regulatory process add up to inadequate regulation of pesticides is not protection of public health. The vast majority of all pesticide products registered for use by EPA and state governments have never been fully tested for the full range of potential human health effects, such as cancer, birth defects, genetic damage, reproductive effects and neurological disorders, and endocrine disruption. Indeed, pesticides can be registered even when they have been shown to cause adverse health effects. Due to the numerous pesticide formulations on the market, the lack of disclosure requirements, insufficient data requirements, and inadequate testing, it is impossible to accurately estimate the hazards of pesticide products, much less lifetime exposure or risk. There is no way to predict the effects in children solely based on toxicity testing in adult or even adolescent laboratory animals, which is EPA's procedure for evaluating adverse effects.

MYTH #6:

Each school board should only be responsible for maintaining a registry of individuals interested in being notified and not be overly burdened with providing universal notification.

FACT #6:

Parents are often kept in the dark about pesticide use at schools. Without notification, parents are unable to make important decisions about whether they want their children to go to school when potentially hazardous pesticides have been applied.

Universal notification is a good way to make sure that *all* parents, guardians, children and staff are aware and warned about pesticide applications. Providing prior notification to all individuals attending or working at a school is less obtrusive to the school's administrative staff. Universal notification does not require a separate database. Several school districts around the country, such as Ann Arundal County Public School system in Maryland, agree that it is much less cumbersome to provide universal notification. Many schools already send home notices and school announcements about lice infestation, field trips, book fairs, and crime at school. Schools can simply send universal pesticide notices as they would other such announcements or they can be attached to notices already being sent home.

By providing prior written notification to all parties that would otherwise unknowingly be exposed to the chemicals and posting notification signs, affected parties can take the necessary precautions to avoid the exposure and potential harm it may cause.

Notification–based registries are a less effective means of notifying people and does not qualify as right-to-know because of its limited scope. Requiring that individuals place themselves on registries, affords only those who already know about toxic exposure the opportunity to be informed about pesticide use in the school. Registries are more costly and more resource consuming for school districts to implement. It may even require an extra staff person to keep the registry up to date and coordinate the notification.

MYTH #7:

Notification of pesticide applications are unnecessarily alarming parents and is a scare tactic by environmentalists.

FACT #7:

Parents and school staff have a basic right-to-know when pesticides are being used at school. By providing prior written notification to all parties that would otherwise unknowingly be exposed to the chemicals and posting notification signs, affected parties can take the necessary precautions to avoid the exposure and potential harm it may cause. Pro-pesticide lobbyists may be concerned that if parents and school staff know that a school is applying an EPA classified probable carcinogen, neurotoxin or other type of hazardous pesticide, they may be activated to advocate for alternative approaches that prohibit these chemicals. As discussed above, schools do not need to use toxic pesticides in the buildings or on the grounds where children spend their time learning and playing. IPM, if properly implemented, enables a safe learning environment for children, one that does not introduce unnecessary and routine use of toxic pesticides.

MYTH #8:

Parents and staff only need to be notified 24 hours prior to the use of pesticides at schools.

FACT #8:

Twenty-four hour prior notification of pesticide use does not provide enough time react. Prior notification should be made 72 hours in advance to make sure the information has been received by the student's parents or guardians and by school staff, allowing them to obtain further information regarding the pesticide application, and, if necessary, to make arrangements to avoid the exposure.

MYTH#9:

Schools should not have to notify parents and teachers prior to the use of baits, gels, pastes pesticide applications.

FACT#9:

As long as the bait, gel or paste falls under the "least toxic pesticide" definition (*see box on page 16*), schools do not need to provide prior notification. However, advance notification should occur for any formulation containing pesticide or other toxic ingredients that are volatile or toxic synergists. Just because a pesticide is applied in baits, gels and/or pastes does not mean these products do not contain a chemical that is a carcinogen, mutagen, teratogen, reproductive toxin, developmental neurotoxin, endocrine disruptor, or an immune system toxin.

MYTH #10:

As long as the pesticide is not applied while the area is occupied, once the students and teachers return to the area, the pesticide has dried and will not affect their health.

FACT #10:

Pesticides should never be applied when students or staff are, or are likely to be, in the area within 24 hours of the application. Pesticides residues can linger for hours, days and even months after an application is made. It all depends on the type of chemical applied and the conditions that may apply to its degradation. For example, airborne concentrations of seven insecticides were tested three days following their application in separate rooms. Six of the seven pesticides left residues behind through the third day.[10] A 1998 study found that Dursban (chlorpyrifos) accumulated on furniture, toys and other sorbant surfaces up to two weeks after application.[11]

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Schools Save Money With Integrated Pest Management

A Beyond Pesticides Fact Sheet

Integrated Pest Management (IPM) is a program of prevention, monitoring and control which offers the opportunity to eliminate or drastically reduce pesticides in schools, and to minimize the toxicity of and exposure to any products which are used. Habitat modification, the cornerstone to any IPM program, is key to eliminating and preventing pest outbreaks.

Because IPM focuses on prevention of the pest problem, and proper monitoring to determine the extent of the pest problem, school IPM programs can decrease the amount of money a school will spend on pest control in the long-term. Chemical-intensive methods, a symptomatic approach to managing pest problems, may only prove to be less expensive in the short-term. The long-term health of our children is not worth some short-term economic savings that just do not add up over time.

According to the U.S. Environmental Protection Agency, "Schools across the nation that have adopted such programs report successful, cost-effective conversion to IPM. IPM can reduce the use of chemicals and provide economical and effective pest suppression ... [P]reliminary indications from IPM programs ... suggest that long term costs of IPM may be less than a conventional pest control program."[1]

In a report entitled, *Pesticide Use At New York Schools: Reducing the Risk*, the Attorney General of New York State, Eliot Spitzer, says the following:

> We often hear that implementation of integrated pest management...can be expensive. Because it is easy to envision costs associated with establishing new policies and practices, re-training personnel and educating building occupants, this can be a powerful argument to school administrators trying to squeeze the most out of admittedly tight budgets. While the argument might have some initial appeal, experience tells a different story. In case after case, schools and other institutions have reduced their pest control costs early in the transition, often in the first year.[2]

The Washington State Department of Ecology has done a careful analysis of the costs of pest control that considers some of the "hidden" costs, such as regulatory compliance, waste disposal, insurance, and liability for health effects, environmental damage and compliance violations.[3]

Depending on the school's current maintenance, sanitation and pest management practices, some economic investment is usually required at the outset of an IPM program. Short-term costs may include IPM training, purchasing new equipment, hiring an IPM coordinator, or making preliminary repairs to buildings. Whether the pest management services are contracted out, performed internally by school staff, or both may also affect the cost of implementing a school IPM program.

Activities that can be absorbed into a school's existing budget include training of maintenance, cleaning and food service staff and educating students and teachers to modify their behavior. In addition, some school maintenance and structural repair funds may already be budgeted for activities such as replacing water-damaged materials, landscaping, waste management, and physical barriers.

Integrated Pest Management

a) eliminates or mitigates economic and health damage caused by pests;

b) minimizes the use of pesticides and the risk to human health and the environment associated with pesticide applications; and,

c) uses integrated methods, site or pest inspections, pest population monitoring, an evaluation of the need for pest control, and one or more pest control methods, including sanitation, structural repairs, mechanical and living biological controls, other non-chemical methods, and, if nontoxic options are unreasonable and have been exhausted, least toxic pesticides.

Monitoring is critical to reducing pest management costs because it helps pest managers determine if, when and where pest populations warrant action and therefore requires more precise and strategic pest management approaches. For example, instead of spraying the entire school building for a pest, monitoring may determine that the pest problem is concentrated in the food service area, thus decreasing the amount of resources needed to control the pest population. Without monitoring, conventional pest management spray programs tend to spend a lot of time spraying materials into all sites. Monitoring can also help determine if damage thought to be caused solely by pests is actually caused by other factors; like poor drainage or leaky pipes.

The fact that pest control is not often a large part of the school's budget should not hinder the school's transition to an IPM program. It is not necessary for the entire school to be monitored, just those areas with the potential for a pest problem, leaving the other areas to be monitored and managed on a complaint basis. In addition, certain facets of an IPM program could be implemented over time in order to keep costs down.

Pests can be managed effectively and economically without toxic chemicals through the implementation of a clearly defined IPM program. *For more information about IPM and school pest management, contact Beyond Pesticides.*

Examples of IPM as an Economical Approach to Pest Management

Across the country, schools and communities that are currently using IPM strategies indicate that a well-managed IPM program is saving them money. Following are just a few examples.

- A school board member in Illinois has stated that "most [of the] schools utilizing IPM strategies [in his school district state] that IPM does not cost more, it just costs differently. Thus, a school having a problem with mice might install door sweeps to deny access instead of continuously allocating funds for a pest control professional. Additionally, an IPM program need not be burdensome with regard to personnel. Typically, it will require some light training, and it then integrates seamlessly into existing roles and responsibilities."[4]
- The Boulder Valley School District in Colorado has saved thousands of dollars for pest management after hiring a company that has successfully controlled the schools' pest problems with the implementation of an IPM program that does not use any toxic pesticides.[5]
- Before Monroe County Schools in Bloomington, IN implemented an IPM program in 1995, it was spending about $34,000 on pest management. With the hiring of an IPM Coordinator in 1997, and spending less than $1,000 per year on products, the school district is saving around $13,600 a year in pest management.[6]
- A survey of 21 Pennsylvania school districts found that 81 percent were able to control pest problems using IPM with little or no change in costs.[7]
- At Vista de las Cruces School in Santa Barbara, California, pest management was contracted out with a pest control company for $1,740 per year for routine pesticide applications. After the school switched to an IPM program, their costs were reduced to a total of $270 over two years.[8]
- A school in Susquehanna, New York implemented an IPM program after students were poisoned from a pesticide misapplication. The school engineer states that they have cut costs by more than $1,000 per year "and the turf looks better than ever."[9]
- Mt. Lebanon School District in Pittsburgh, Pennsylvania's IPM program is "manageable and no more expensive than using pesticides." The school district has implemented their IPM program since 2000 "at a relatively low cost with improved playing surfaces."[10]
- A well-known example of school IPM is the Montgomery County, Maryland public schools. The IPM program in Montgomery County covers 200 sites used by over 110,000 students and 12,000 employees. Although German cockroaches are the biggest problem the county faces, they also manage rodents, termites, and stored food pests. The county successfully reduced pesticide use from 5,000 applications in 1985 to none four years later, saving the school district $1,800 per school and $30,000 at the food service warehouse.[11]
- In another county in Maryland, the Anne Arundel School District reduced its pest control budget from $46,000 to $14,000 after its first year of IPM implementation.[12]
- An IPM program at the University of Rochester resulted in a 50 percent reduction in material costs and a substantial reduction in personnel costs.[13]
- The City of Santa Monica, California's IPM program for the city's public buildings and grounds reduced the cost of pest control services by 30 percent.[14]
- Albert Greene, Ph.D., National IPM Coordinator for the U.S. General Services Administration, has implemented IPM in 30 million square feet, approximately 7,000 federal buildings, in the U.S. capital area without spraying toxic insecticides. Dr. Greene states that IPM, "can be pragmatic, economical and effective on a massive scale."[15]

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