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ABSTRACT

There are a variety of state statutes that have been enacted to protect children in schools, but only about half of all state legislatures have examined pesticide use in schools, only 16 states directly address indoor use of pesticides, and the federal government is silent. While the federal government gives states and local governments the authority to regulate pesticide use, most states have preempted local governments in regulating pesticides. This report examines state legislative efforts pertaining to pesticide use in and around schools in the following areas: creating restricted spray zones to address pesticide drifting towards schools; posting signs for pesticide applications; requiring prior written notice for pesticide use; prohibiting when and where pesticides can be applied; and requiring a strong integration pest management program that limits the use of certain toxic materials. Contains 12 endnotes. (GR)

The Schooling of State Pesticide Laws

Review of State Pesticide Laws Regarding Schools

By Kagan Owens and Jay Feldman

The state of public health and environmental protection from pesticides is deficient. Children, as a subpopulation, are among the least protected. The federal regulatory system, since the publication of *Pesticides in the Diets of Infants and Children*[1] in June 1993, is just beginning to consider the special vulnerabilities of children. It remains to be seen whether the *Food Quality Protection Act* (FQPA), passed in 1996, will adequately address children. At this point, EPA generally lacks data on children and has failed to adopt the tenfold additional safety margin in the statute, provided for situations where data on children is not available. Less than a dozen out of 91 tolerances set since the passage of the FQPA have used the tenfold safety factor for children in their risk assessments. EPA standard setting is bogged down in discussion of exposure assumptions and margins of safety. Meanwhile, state governments have, in some cases, attempted to step into the breach by regulating pesticide use and in some cases type of pesticides used.

What are states doing and is their action sufficient to offer the level of protection truly needed? In a series of reports over the year, NCAMP is reviewing the states' laws on pesticides. In this piece, we look at issues that specifically pertain to schools, including: (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 a strong integrated pest management (IPM) program that limits the use of certain toxic materials. These are essential ingredients in a program to protect children from pesticides at school.

One might ask, why doesn't the federal government offer some minimal standards regarding the right-to-know when pesticides are being used in schools, protection from pesticide drift in school yards, requirements for least toxic integrated pest management, and special protection for children?

These are all basics not provided for under federal law. It represents a serious failure of EPA and one that reflects a politicized decision making process at the agency. Without minimum federal standards in these areas, the protection provided children is uneven across the country. Just over half of the states, or 30 states, have adopted pesticide acts and regulations that address the protection of children by specifically focusing on pesticide use in, around or near their schools. Of these, only 16 states address indoor use of pesticides.[2] This review is intended to determine what each state is required to do under its statutes and regulations. It does not evaluate the enforcement or quality of the program that may be in place. This report does not fully examine all the administrative materials that have been developed. Rather it illustrates the state laws themselves and the requirements established.

Just over half of the states, or 30 states, have adopted pesticide acts and regulations that address the protection of children by specifically focusing on pesticide use in, around or near their schools. Of these, only 16 states address indoor use of pesticides.

Fed Allows State and Local Authority; 40 States Preempt Local Powers

And so, the role of states and local jurisdictions is absolutely critical as a means of exerting a level of protection that children deserve. The role of states is well established. There are no federal prohibitions on states exceeding the federal standards. States have the authority to regulate the sale or use of pesticides as long as the state regulation does not permit a sale or use prohibited by section 24(a) of the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA), USC 136v(a). The authority of local governments is a different story. While the chemical industry had argued for over a decade in the 1980s that FIFRA prohibits local regulation of pesticides, the U.S. Supreme Court affirmed the rights of cities and towns to regulate pesticides under FIFRA. The court found on June 21, 1991 that FIFRA "leaves the allocation of regulatory authority to the 'absolute discretion' of the states themselves, including the option of leaving local regulation of pesticides in the hands of local authorities." However, since the Supreme Court ruled, 40 states (*see chart*), whose legislatures have been subject to chemical industry lobbying, have acted to preempt local authority to regulate pesticides. This prohibition of local laws has always been viewed by NCAMP as antithetical to public health protection and local police powers (such as smoking ordinances, building codes, etc.). However, despite attempts to squelch local action, increasingly local governments and other public bodies with land holdings, such as school districts, have chosen to adopt policies providing notification of pesticide spraying and alternative approaches to pest management. In these cases, the school board or town government is acting as a property owner in what many believe is the best interest of children.

State governments can and, in some cases, do play a leadership role in protecting the public from pesticides. This piece, based on a review of the current state pesticide laws, looks at what the states have done as it affects children and schools.

The Case for Protecting Children

Children are especially sensitive to pesticide exposures. Children take in more pesticides relative to body weight than adults and have developing organ systems that are more vulnerable and less able to detoxify toxic chemicals.[3] Low levels of pesticide exposure can adversely affect a child's neurological, respiratory, immune and endocrine system. One of the most com-

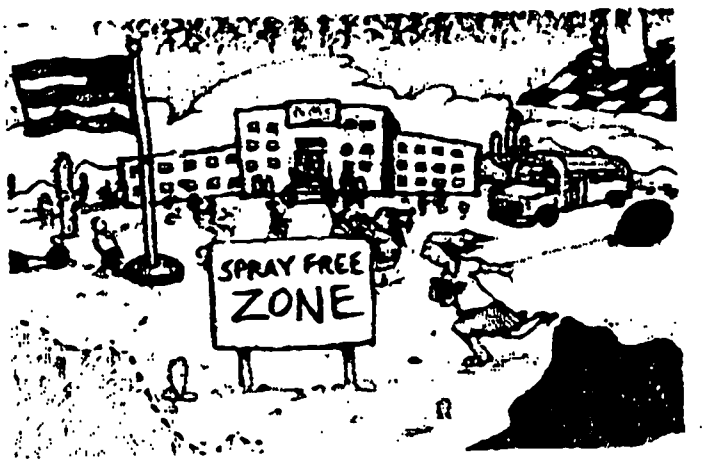
Table 1. States that preempt local governments from regulating pesticides.

Alabama	Yes	Indiana	Yes	Nebraska	Yes	South Carolina	Yes
Alaska	No	Iowa	Yes	New Hampshire	Yes	South Dakota	No
Arizona	Yes	Kansas	Yes	New Mexico	Yes	Tennessee	Yes
Arkansas	Yes	Kentucky	Yes	New Jersey	Yes[1]	Texas	Yes
California	No	Louisiana	Yes	New York	Yes	Utah	No
Colorado	Yes	Maine	No	Nevada	No	Vermont	No
Connecticut	Yes	Maryland	No	North Carolina	Yes	Virginia	Yes
Delaware	Yes	Massachusetts	Yes	North Dakota	Yes	Washington	Yes[2]
Florida	Yes	Michigan	Yes	Ohio	Yes	West Virginia	Yes
Georgia	Yes	Minnesota	Yes	Oklahoma	Yes	Wisconsin	Yes
Hawaii	No	Mississippi	Yes	Oregon	Yes	Wyoming	No
Idaho	Yes	Missouri	Yes	Pennsylvania	Yes		
Illinois	Yes	Montana	Yes	Rhode Island	Yes		

1 Local ordinances must be submitted for approval to the New Jersey Department of Agriculture.

2 Local ordinances must go to the Washington Office of the Attorney General for interpretation and approval. Generally, use restricted ordinances are not approved.

monly used insecticides in schools, chlropyrifos (Dursban) is a nervous system poison. It poisons children by reducing the body's production of the enzyme cholinesterase, necessary to the transmission of nerve impulses, triggering a range of symptoms from nausea, dizziness, headaches, aching joints to disorientation and inability to concentrate.[4] Other widely used insecticides, synthetic pyrethroids, stimulate nerves causing hypersensitivity and are associated with asthma. Many pesticides affect the immune system, which can result in increased problems with allergies, asthma, hypersensitivity to chemicals and a reduced ability to combat infections and cancer.[5] Many in-



secticides, herbicides and fungicides are linked to cancer. The commonly used weed killer 2,4-D has been linked to non-Hodgkin's lymphoma in scientific studies of farmers.[6] Studies show that children living in households where pesticides are used suffer elevated rates of leukemia, brain cancer and soft tissue sarcoma.[7] The probability of an effect such as cancer, which requires a period of time to develop after exposure, is enhanced if exposure occurs early in life.[8]

Children's exposure to pesticides at school occurs as a result of applications made before children enter the building and sometimes while they are present. The chemical fills the air in the room and settles on desks, counters, shades and walls. Exposure occurs from breathing contaminated air or touching contaminated surfaces. The residues can remain for days and sometimes break down to other dangerous compounds.

Concerns about the known and unknown hazards of pesticide use, as well as deficiencies in the regulatory review process, have prompted a variety of legislative and administrative responses by states across the country. We must improve the protection of children from pesticide use in schools. The following is a tool for those advocating public policies that provide greater protection for children while attending school. Raising the level of protection across the nation to meet the highest possible standards is an important goal. 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.

Restricted Spray (Buffer) Zones Around School Property

OVERVIEW

Pesticides move off the target site when they are sprayed, whether inside or outside. When sprayed outside, pesticides drift on to nearby property resulting in off target residues. Buffer zones can eliminate unconsented exposure from spray drift on to school property. As a result, states require buffer zones around schools. 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. Aerial applications should have a larger buffer zone, at least 3 miles encircling the school. Buffer zones should be in effect at all times of the day. It is especially important, as the states below require, for spray restrictions to be in place during commuting times and while students and employees are on school grounds.

Six states have recognized the importance of controlling drift by restricting pesticide applications in areas neighboring a school. These states, Alabama, Arizona, Louisiana, New Hampshire, New Jersey, and North Carolina create spray restriction zones that range from 300 feet to 2½ miles. Only in the case of gypsy moth spraying does New Jersey require the largest buffer zone of 2 and 2½ miles, depending on the grade levels of the school. Otherwise, New Jersey sets a 300-foot buffer around schools. All five states require spray restriction zones for aerial applications. Only Arizona and New Jersey require buffer zones for both ground and aerial pesticide applications.

STATE REVIEW

Alabama Department of Agriculture and Industries Rules for Application of Pesticides by Aircraft, section 80-1-14-.07(8)(a), prohibits pesticide spraying from an airplane within 400 feet of school grounds.

Arizona Administrative Code, section 3-365(D), requires buffer zones around schools for applications of odoriferous pesticides profenofos, sulprofos, def, merphos and other pesticides with similar odoriferous characteristics. These types of pesticides are not to be sprayed within ¼ mile of a school or day care facility, whether ground or aerial application. This section also states that highly toxic pesticides cannot be applied within ¼ mile of a school or day care facility.

Louisiana Advisory Commission on Pesticides, section 149(B), restricts commercial aerial applications within 1,000 feet of any school grounds during normal school hours, with the exception of aerial mosquito control applications. Schools include, public or private, day or residential, and elementary to secondary schools.

New Hampshire Code of Administrative Rules, section 506.09, states that aerial applications cannot occur when children are commuting to and from school and when there is outdoor activity. This section also prohibits aerial applica-

tions in sensitive areas, including day care centers and school buildings and property, playgrounds and athletic fields. Distance to the school is subject to the aerial application permit.

New Jersey Pesticide Control Regulations, section 7:30-10.3, states that community or areawide pesticide applications for the control of gypsy moths must not occur within 2 miles of a kindergarten through 8th grade school and within 2½ miles of grades 9 through 12, or when students are commuting to and from school. Section 7:30-10.5(q) restricts aerial applications 300 horizontal feet around any school property when people are on school property.

North Carolina Administrative Code, Title 2, subchapter 9L, section .1005, prohibits aerial application within 300 feet of schools and cited buildings.

Posting Notification Signs for Indoor Pesticide Applications

OVERVIEW

States use different approaches in providing school pesticide use information to parents, students and staff. Some forms include the posting of notification signs and/or the distribution of notices directly to the affected population. Posted notification signs warn those in the school when and where pesticides have been or are being applied. This is a vehicle for basic right-to-know if the posting occurs in an area where it is easily seen by parents, students (old enough to understand, perhaps 12 or older) and staff. It is important to post signs for indoor 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 at least 72 hours. It takes time for pesticides to start breaking down and some pesticide residues can remain for weeks or more. Signs should also be posted at all main entrances of the building and the specific area sprayed, on the main bulletin board, and, for more comprehensive notification, in the school newspaper or on the daily announcements. Posted signs should state when and where a pesticide is applied, the name of the pesticide applied and how to get further information, such as a copy of the material safety data sheet (MSDS)[9] and the product(s) label.

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 at least 72 hours.

Ten states require posting of signs for indoor school applications. Texas and West Virginia require posting before commencement for a specific time period. Texas, the stronger of the two, requires the posting of warning signs at least 48 hours in advance of the application. Students and school employees warned ahead can avoid exposure. Georgia requires posting signs outside when a structural application continues outside the structure.

STATE REVIEW

Arizona Education Code, title 15 section 152, states that the governing board of each school district is to adopt a policy on the procedures for posting signs for pesticides applied to the school's property. No further details are included in the Code.

Georgia 1996 House Bill 1317 requires posting signs when an applicator, including building operator or commercial applicator, applies restricted use pesticides[10] in public buildings. Public buildings include those used for educational purposes, schools, dormitories, and university buildings. The sign must be posted before the application in a noticeable place at a building's entry and remain for 24 hours following the application. The posted notice includes the location of treatment and how to obtain a copy of the MSDS on the pesticide(s) applied.

Maine Board of Pesticides Control regulations, chapter 22 section 2(G), requires posting signs for structural pesticide applications when the application occurs in an area of "likely human use," including any area within 150 feet of a building used for commercial or institutional purposes or is regularly used. The sign must be posted before the commencement of the application and remain for 48 hours.

Maryland 1998 House Bill 286, an act concerning *Public Schools – Integrated Pest Management*, requires middle and high schools to develop "in-school notification to students and staff members before a pesticide is applied" (1998 Md. Laws 286 § 1(l)(4)). It also states that "in-school notification" is required for bait stations used in elementary or secondary schools. Such notification "may include a sign posted on the door of the room or the room in which the bait station is placed" (1998 Md. Laws 286 § 1(L)). Information regarding the application is available upon request.

Massachusetts Code of Regulations, title 333, section 13.10(3)(c), requires posting signs when commercial applicators apply pesticides to public buildings. Public buildings include schools, day care centers, nursery schools, and institutions. Signs are to be posted at all entrances to the area where pesticides are to be applied before the application begins. The signs are to remain "posted after the application" (MASS. REGS. CODE tit. 333, § 13.10(3)(c)(2) (1996)). No exact amount of time is specified. Enclosed baits and traps and wood preservatives are exempt. The applicator must provide information regarding the pesticide application, including the pesticide product's label, to anyone that requests it.

Michigan Pesticide Use Regulation, section 285.637.11 of the Michigan Administrative Code, requires posting by the commercial applicator making a broadcast, foliar, or space application of restricted-use insecticide to a day-care center or school. Schools, including public or private, kindergarten through 12th grade, must post a sign at the primary point of entry to the building. Posting is required upon completion of the application and must remain in place for at least 48 hours.

Montana Pesticide Act, section 80-8-107 of the Montana Code Annotated, requires posting signs when a building operator or commercial applicator applies pesticides to any building used for education or institutional purposes, schools, dormitories, and university buildings. Signs must be posted at the time of the application at each entrance to the building or room. Signs are to remain posted "until the pesticide is dry or the reentry interval has expired" (MONT. CODE ANN. § 80-8-107(3) (1997)). Signs state how information regarding the application, including how to obtain a copy of the MSDS and label for the product(s) used, may be obtained. Posting is not required for pest baits, pastes and gels.

New Jersey Pesticide Control Regulation, section 7:30-9.10(c) of the New Jersey Administrative Code, requires permanent posting at the central bulletin board for indoor school pesticide applications. The notice must include a contact for receiving more information and the next application date. The posted sign may be removed 60 days after the last treatment if no more applications are planned.

Texas Structural Pest Control Board Regulations, section 595.8(b), states that posting is required for schools, educational institutions, and day care centers in common access areas at least 48 hours prior to the application. The school is responsible for posting the notification signs. A "Consumer Information Sheet" is given to any employee working in the building at his/her request. Schools are defined as public, private, and parochial primary and secondary schools. The length of time for signs to remain posted is not specified.

West Virginia Code of State Rules, title 61 section 12J, requires day care centers to post signs when crack and crevice, spot, broadcast or space pesticide applications are made in the center. Section 12J-8.3.2 states that the notice must be posted at least 24 hours in advance at the place where the parent or guardian signs the child in and out of the facility.

Posting Notification Signs for Outdoor Pesticide Applications

OVERVIEW

For a wider range of protection, states should require posting pesticide notification signs for outdoor pesticide applications as well. Students who play sports or people continually on the lawns are at high risk when pesticide applications occur on school fields. Dermal exposure can occur when a football player gets tackled, a soccer player slides to make a block or a student sits on the grass to eat lunch or watch a game. Inhalation exposure can occur when a player breathes in kicked up dust and dirt and pesticide residues. Even spectators at a game or passersby face inhalation exposure to pesticides that volatilize or vaporize off the treated area.

Twenty-two states have posting requirements when pesticide applications are made on school grounds. States should require signs to be posted for at least 72 hours, as Rhode Island requires. Seven states require posting for both indoor and outdoor pesticide applications. (See Tables 2 and 3) Sixteen of the following states have posting requirements for lawns, with definitions that include school grounds.[11]

STATE REVIEW

Arizona Education Code, title 15 section 152, states that the governing board of each school district is to adopt a policy on the procedures for posting signs for pesticides applied to the school's property. No further details are included in the Code.

California Food & Agricultural Code, section 12978, requires posting on school grounds, when the pesticide applied has a worker reentry interval[12] of at least 24 hours. The school is responsible for posting the sign for the length of the restricted-entry interval.

Colorado Pesticide Applicator's Act Rules and Regulations, Part 13, requires commercial or public turf and ornamental applicators to post notification signs at the time of an application. Lawn applications, including athletic fields, playgrounds, and "other similar recreation or common property," require sign posting adjacent to the specific area treated. No time for signs to remain posted is specified.[11]

Connecticut General Statutes, section 22a-66a(c), requires posting signs when general use or restricted use pesticides are applied by any individual, regardless of certification or commercial status, to lawns within one hundred yards of any property line. "Noncommercial applications to an area less than one hundred square feet or to a fenced area" (CONN. GEN. STAT. § 22a-66a(c)(1) (1997)) are exempt from the posting requirement. The statutes also require posting signs for structural applications made to the surrounding grounds.[11]

Florida Statutes, chapter 482 section 2265, require licensed or certified applicators to post signs at the commencement of an application to a lawn. No amount of time for the sign to remain is specified in the statutes or administrative code.[11]

Table 2. State School Pesticide Policies — Summary

State	Buffer Zones	Posting Signs: Indoor	Posting Signs: Outdoor	Prior Notification	IPM Defined	Prohibition of Use
Alabama	Yes					
Arizona	Yes	Yes	Yes	Yes		
California			Yes			
Colorado			Yes			
Connecticut			Yes		Yes	
Florida			Yes		Yes	
Georgia		Yes	Yes			
Illinois			Yes		Yes	
Indiana			Yes			
Iowa			Yes			
Kentucky			Yes			
Louisiana	Yes			Yes	Yes	Yes
Maine		Yes	Yes		Yes	
Maryland		Yes	Yes	Yes	Yes	
Massachusetts		Yes	Yes	Yes	Yes	
Michigan		Yes	Yes	Yes	Yes	Yes
Montana		Yes			Yes	
New Hampshire	Yes		Yes			Yes
New Jersey	Yes	Yes	Yes	Yes		Yes
New York			Yes			
North Carolina	Yes					
Ohio			Yes			
Oregon					Yes	
Pennsylvania				Yes	Yes	Yes
Rhode Island			Yes			
Texas		Yes		Yes	Yes	Yes
Vermont			Yes			
Washington			Yes			
West Virginia		Yes		Yes	Yes	Yes
Wisconsin			Yes			

Georgia Department of Agriculture Pesticide Use and Application Rules, chapter 40-21-9, requires commercial and non-commercial applicators to post notification signs when applying pesticides to nonresidential properties. Signs are to be posted at the commencement of the application and removed "the day after the application." Information regarding the application is left with the building manager or custodian.[11] Georgia Rules and Regulations, section 620-3-.02(k)(2)(iv), require posting at the primary points of entry to the treated area when structural applications extend 6 feet outside of the structure. The building operator is responsible for providing, upon request, information regarding treatment and a copy of the MSDS and the label.

Illinois Lawn Care Products Application and Notice Act, chapter 415 section 65/3 of the Illinois Complied Statutes, requires an "applicator for hire" to post signs when applying pesticides to turf or ornamentals. The sign may be removed the following day.[11]

Indiana Administrative Code, section 1-5-1, requires licensed applicators for hire to post signs when applying a pesticide to a lawn. The signs are to remain posted until the following day.[11]

Iowa Administrative Code, section 21-45.50, requires "commercial and public applicators who apply pesticides within urban areas in municipalities" (IOWA ADMIN. CODE r. 21-45.50 (1998)) to post signs before the commencement of an application to commercial or public lawns. Signs must be posted immediately adjacent to the treated area and at the entrance to the park, athletic field, playground or "other similar recreational property." The sign is to remain posted for at least 24 hours. Structural pesticide applications that occur outside the perimeter of the structure are exempt from this posting requirement. Signs include contact information to receive more information on the pesticide(s) applied, upon request.[11]

Kentucky Pesticide Use and Application Act, chapter 217 section 300 of the Kentucky Revised Statutes, requires an applicator for hire to post signs immediately following a lawn application. The sign is to remain until the following day. [11]

Maine Board of Pesticides Control regulations, chapter 22 section 2(G), requires certified applicators to post signs for applications to turf and ornamentals when the application occurs in an area of "likely human use," including any area within 150 feet of a building used for commercial or institutional purposes or is "regularly used." The sign must be posted before the commencement of the application and remain for 48 hours.[11]

Maryland Department of Agriculture Pesticide Use Control Regulations, section 15.05.01.15, require licensed or permitted lawn applicators to post notification signs at the time of application. Signs are to be placed at the entrance to the treated area or if only a small area is treated, adjacent to the treated area. The sign is to remain posted for 48 hours.[11]

Massachusetts Code of Regulations, title 333 section 13.07(2), requires the commercial or certified applicator to post signs when applications are made "for the control of turf pests on public or private non-residential properties" (333 CMR § 13.07(2) (1996)). No amount of time for the signs to remain posted is specified. Signs are required for restricted use as well as general use pesticides.[11] Massachusetts Code of Regulations, section 13.05(3)(h), requires the posting of signs at the border of treated agriculture property 10 hours before aerial applications that occur within 500 feet of a school's property. The sign is to remain posted for 48 hours.

Michigan Administrative Code, section 285.637.11, requires commercial applicators applying a broadcast, foliar or space restricted use pesticides to turf or ornamentals to post notification signs. Signs are to be posted immediately following the application and remain posted for 24 hours.[11]

New Hampshire Code of Administrative Rules, section 508.01, requires signs to be posted when commercial applications are made to turf areas. The signs are to remain posted for 48 hours.[11]

New Jersey Pesticide Control Regulation, section 7:30-9.11(d), requires any commercial pesticide turf or ornamental application to school grounds, such as athletic fields, playgrounds and recreation areas, to post signs at the start of the application. Signs are to remain posted for at least 24 hours at the main entrance points to that area. Signs include contact information to get more information on the pesticide(s) applied.

New York Environmental Conservation Law, sections 33-09 and 33-10, require certified and commercial lawn applicators to post signs for applications made to lawns. Signs are to remain posted for 24 hours. Information regarding the application is available upon request.[11]

Ohio Rule 901:5-11-09, promulgated under Ohio Revised Code chapter 119, requires posting signs for pesticide applications made to public lawns, which include "school yards." The sign must remain for at least 24 hours after treatment. The sign includes information on how to obtain facts regarding the pesticides used in the application.

Rhode Island Rule T, promulgated by the Rhode Island Pesticide Control Law, requires signs to be posted before a commercial applicator begins a pesticide application to school grounds, playgrounds or athletic fields. The signs must remain posted for 72 hours. The school is responsible for posting the signs. The signs state the name of the pesticide(s) applied.

Vermont Regulations for Control of Pesticides, section IV(8), requires certified commercial and non-commercial applicators to post signs at the commencement of a turf and ornamental application made to "public non-residential properties." The sign is to remain posted for 24 hours. Such areas that are fenced require posting in the visitor reception area and the main employee entrance. Information regarding the application is available upon request.[11]

Washington Pesticide Application Act, section 17.21.410 of the Revised Code of Washington, requires that an individual, not just a certified applicator, that applies pesticides to the grounds of a school, nursery school or day-care center, must post a sign at the time of the application. Details on whom to contact for information regarding the pesticide application is included on the sign. No length of time for the sign to remain posted is specified.

Wisconsin Administrative Code, section 29.56, requires a person applying pesticides to turf or ornamentals on "public or commercial facilities," parks, workplaces, recreational areas and public lands to post notification signs. Signs are to be posted prior to commencement of the application and remain until sunset the follow-

ing day. The applicator will provide information regarding the application upon request.[11] Farms within 300 feet of schools, playgrounds and day care facilities must post signs for restricted entry pesticides during restricted period.

Prior Written Notification

OVERVIEW

Written notification prior to each pesticide use in the schools is a good way to make sure that all parents, children and staff are aware and warned. Limited notification-based registries is 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, sometimes only with a doctor's letter, affords only those who already know about toxic exposure the opportunity to be informed about pesticide use in the school. 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. Notification should include the name of the pesticide(s), the day and time, and area of the application and how to obtain a copy of the MSDS and label.

Written notification prior to each pesticide use in the schools is a good way to make sure that all parents, children and staff are aware and warned.

Nine states have requirements to notify students and/or employees of the school before a pesticide application is to occur. Arizona and Maryland require that the schools give prior notification to each parent, guardian and staff. This is the most comprehensive and effective approach to written notification. Arizona is the only state that addresses what should be done for students and staff who are not able to attend the school because of the application. West Virginia requires automatic prior notification of applications of certain pesticides to all employees. Eight states require schools to inform the parent or guardian of their right, if they choose, to be listed on a registry. Two of these states, Louisiana and Pennsylvania, require medical verification to be listed on a registry. Seven states require both posting signs and prior notification of a school pesticide application, which provides the widest range of notification activities. Virginia addresses the issue of pre-notifying people when pesticides are used in schools but does not actually require it. Maine's requirements enable people to request to be notified of an application on property surrounding a school.

STATE REVIEW

Arizona Structural Pest Control Commission Rules and Administrative Regulations, section 32-2307 of Arizona Administrative Code, requires the pest control operator to notify the school 72 hours before any pesticide application and again immediately before the application is to begin. Arizona Education Code, title 15 section 152, requires the school to then notify parents and staff of the proposed pesticide application within 48 hours of the commencement of the application. This section of the Education Code also requires that the governing board of each school district develop a policy and procedure for notifying parents, guardians, students and employees during the school's regular session, procedures for posting signs to identify pesticide application areas, and procedures for providing for continuing instruction for pupils who are absent because of pesticide applications on school property.

Louisiana State Pesticide Law, section 3389 of the Louisiana Revised Statutes, requires all schools to maintain a pesticide sensitive student registry. Schools include public or private, day or residential, and elementary to secondary schools. Parents must submit in writing their request to be pre-notified. Medical verification of a student's sensitivity is also required.

Maine Department of Agriculture, Food and Rural Resources, Board of Pesticide Control Regulations chapter 22 section 5, states that an occupant of a sensitive area, including a school, can request to be notified of a pesticide application that will occur within 500 feet of a school's property. Notification will occur only if the application is on surrounding land and not when the school itself is applying the pesticide.

Maryland 1998 House Bill 286, an act concerning Public Schools – Integrated Pest Management, requires 24-hour notice to all parents, guardians and staff of pesticide application in elementary school buildings. Prior notification includes a statement that warns of pesticide exposure hazards to pregnant women and infants as well as a short description of the potential adverse effects of the pesticide used. In the case of middle and high schools, the law sets up a registry-based notification system. Parents, guardians and staff are informed how to be included on the registry at the beginning of each school year. A person on the registry will be notified at least 24 hours before a pesticide is applied in the school building. In addition to the registry, middle and high schools are required "to develop an appropriate means of in-school notification to students and staff members before a pesticide is applied" (1998 Md. Law 286 § 1(1)(4)). Written notification, one week in advance of an application, will be given to everyone in the school when a space spraying application occurs in a school building. Before a bait station is used, schools must develop a method of "in-school" notification. If an emergency pesticide application occurs, notification is given within 24 hours after the application.

Massachusetts Code of Regulations, title 333, section 13.10(3)(c), states that when pesticides are applied to public buildings, including schools, day care centers, nursery schools, and institutions, by commercial applicators, the applicator must provide prior

notification to any person who requests it. There are no specifics on how long before the application notification will be or notiftcation procedures.

Michigan Regulation No. 637, Pesticide Use, section 285.637.15 of the Michigan Administrative Code, requires the school district's administrator to provide written information to parents or guardians of students of the school or day-care center on how to be included on the list for prior notification. This information is given at the beginning of the school year, in September for a day-care center, or when a new student enrolls. Prior notification is provided by mail or by telephone and given the day before the application. During the months when school is not in regular session, school administrators may utilize a message notification system.

New Jersey Pesticide Control Regulation, section 7:30-9.12, states that "a person" may request to be notified prior to any pesticide application made to a school's structure, turf or ornamentals. No specific notification times are indicated.

Pennsylvania Code sections 128.111 and 128.112, describes the rules and regulations promulgated under the Pesticide Control Act regarding the pesticide sensitivity registry, which includes prior notification for one's residence, work and school. Pesticides applied within 500 feet of or on the school property, elementary, secondary or day care center, by a commercial or public pesticide applicator, are covered by the law. A physician must verify a person's sensitivity to pesticides in order to be on the registry. Notification will be made between 12 and 72 hours before the application begins. Notification of pesticides will not occur for tamper resistant bait stations.

Texas Structural Pest Control Board Regulations, section 595.8(c), requires schools, educational institutions and day care centers to inform parents or guardians of students in writing that pesticides are periodically applied indoors and that notification of the times and types of applications is available upon request. This notification is made when the student registers, at the beginning of the school year or whenever a student enrolls. The regulation does not specify the period of time for notification although sign posting requirements call for signs to be posted at least 48 hours in advance. School official, employees or parents may request 24-hour prior notice of agricultural spraying within ¼ mile of school.

Virginia does not have specific laws regarding pesticides and schools. However, the Pesticide Control Board has adopted a resolution, "Virginia Control Board's Recommended Procedures for Posting and Notification of Pesticides Applications In and Around Schools" which states that schools should consider establishing notification and posting requirements.

West Virginia, Legislative Rule 61-12J section 8.1.2, requires that all schools and day care centers notify employees at least 24 hours before an application of higher toxicity pesticides, identifted by the state as level 3 and 4. Sections 8.2. and 8.3 require that at the beginning of every school year, or at the time a student enrolls, for schools and day care centers, school administrators must notify parents or guardians of their right to be informed when level 3 or 4 pesticides are applied. If a parent or legal guardian request to be notified, the school official must do so 24 hours prior to the application.

Prohibitions on Use

OVERVIEW

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 employees are in the area or may be in the area within at least 24 hours of the application. Seven states specifically restrict the type and timing of pesticides that may be used in a school. In reality, certain types of pesticides, such as carcinogens, endocrine disrupters, reproductive toxins, developmental toxins, neurotoxins, persistent compounds and substances, bioaccumulative compounds and substances, toxicity category 1 acutely toxic pesticides and ground water contaminants should not be used around children. Sprays invade the indoor ambient environment. Baits must be evaluated carefully for off-gassing or volatility.

STATE REVIEW

Louisiana Pesticide Law, section 3384 of the Louisiana Revised Statutes, states that restricted use pesticides applications are not allowed if students will be within the school or on the school's grounds for normal school activities for at least 8 hours after the application occurs. Schools include public or private, day or residential, and elementary to secondary schools.

Michigan Administrative Code, regulation no. 637 Pesticide Use, section 285.637.15, restricts the type of pesticides to be used in and around schools and day-care facilities. Neither liquid spray nor aerosol insecticide can be used in a school unless the area is unoccupied by students at least 4 hours after the application. It also does not permit outdoor ornamental and turf applications of liquid spray pesticides be made within 100 feet of an occupied room or building during school hours or when people are using the application area.

New Hampshire Code of Administrative Rules, section 506.09(b) and (c), states that pesticides are not to be applied in sensitive areas, such as school buildings, playgrounds, athletic fields and any other property of the school "where exposure to the pesticide(s) may have an adverse effect on human health, wildlife, and the environment" (N.H. CODE ADMIN. R. DIV. PEST. CNTRL. § 506.09(b) (1998)).

New Jersey Administrative Code, section 30-10.3(1), restricts when or where pesticides may be used. It states that no pesticide applications, except rodenticides, roach baits and antimicrobial agents can be applied within any school's (preschool to 12th grade) property, during the school's normal hours. "After normal school hours, ap-

Table 3. How States Around the Country Protect Children from Pesticide Exposure in Schools[1]

STATE	BUFFER ZONES	POSTING SIGNS[2]	PRIOR NOTIFICATION	PROHIBITION OF USE	IPM
Alabama	Aerial spraying, 400 feet.				
Arizona	Ground & aerial spraying, ¼ mile, certain pesticides.	Indoor & Outdoor, each school district authority to set up posting requirements for each school.	Parents & staff, automatic 48 hour notice.		
Connecticut		Outdoor and structural applications made to perimeter of school building.			Requires
Florida		Outdoor, prior posting.			Defines, only
Georgia		Indoor, prior posting, remain for 24 hours. Outdoor and application to perimeter— prior posting and remain until following day.			
Illinois		Outdoor, posted sign removed following day.			Recommends
Louisiana	Aerial applications, 1000 feet, during school hours.		Student registry, medical verification required, no time specified.	Indoor & outdoor applications of restricted use pesticides, entry restricted for 8 hours after application	Recommends
Maine		Indoor & Outdoor, post prior to application & remain for 48 hours.			Recommends
Maryland		Indoor, "in-school notification" in middle & high schools. "In school notification" for bait stations used in elementary & secondary schools. Outdoor, post signs at time of application, remain 48 hours.	Elementary school, automatic 24 hour notice. Middle & high school, registry, 24 hour notice.		Requires
Massachusetts		Indoor, post signs before application. Outdoor, lawn posting required. Post 10 hours prior to aerial agricultural application, remain 48 hours.	Student & employee registry, no time specified.		Defines, only
Michigan		Indoor, post sign after application, remain for 48 hours. Outdoor, post sign after application, remain for 24 hours.	Student registry, 24 hour notice.	Indoor, spray or aerosol insecticides, entry restricted for 4 hours after application. Outdoor, prohibits liquid spray, 100 feet outside of occupied area.	Training, only
Montana		Indoor, post sign at time of application, remain "until dry."			Recommends
New Hampshire	Aerial spraying, during commuting hours, outdoor activity, in sensitive areas.	Outdoor, signs posted for 24 hours.		Pesticides cannot be applied "where exposure may have an adverse effect on human health."	

STATE	BUFFER ZONES	POSTING SIGNS[2]	PRIOR NOTIFICATION	PROHIBITION OF USE	IPM
New Jersey	Ground & aerial gypsy moth applications, during commuting hours, 2 miles grade school, 2 ½ miles high school. Any aerial application, 300 feet.	Indoor, permanent posting at central bulletin board & states the next application date. Outdoor, post sign at start of application & remain posted for 24 hours.	Student & employee registry. Warning for indoor & outdoor applications. No time specified.	No pesticide is permitted to be applied during normal school hours. After normal hours, applications can occur if not in use for time needed for product to dry, settle.	
North Carolina	Aerial spraying within 300 feet of school.				
Oregon					Requires
Pennsylvania			Student & employee registry, indoor & outdoor school applications & within 500 feet of school property, 12 to 72 hour warning.	No applications in "common access areas" during normal school hours or extracurricular activities, 7 hours restricted entry after application.	Defines, only
Texas		Indoor, post sign 48 hours prior to application, no specifics on time to remain posted.	Student registry, indoor applications, no time specified. School official, employees, parents, 24-hour notices, farm spraying within ¼ mile of school.	Pesticides are grouped into Green, Yellow & Red 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 hours restricted entry.	Requires
West Virginia		Indoor, day care centers must 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. Student registry, schools & day care centers, 24 hour warning of level 3 or 4 pesticide.	Pesticides are grouped into levels. Students & employees restrict entry for 4 hours after level 3 pesticide & 8 hours after level 4 pesticide.	Requires
Wisconsin		Outdoor, post prior until sunset next day. Farms within 300 feet of school, during duration of restricted entry pesticides.			

1 This analysis reviews what each state is required to do under its statutes and regulations. It does not fully examine all the administrative materials that may have been developed by the states or local policies adopted within the states.

2 The following 10 states require posting notification signs for outdoor lawn applications: California, Colorado, Indiana, Iowa, Kentucky, New York, Ohio, Rhode Island, Vermont and Washington. These states are not included because this is the only requirement the states have adopted to protect children and staff while at school.

plications can be made in areas where students will not contact treated areas until sufficient time is allowed for the pesticide to dry or settle or longer if the label requires" (N.J. ADMIN. CODE tit. 7 §30-10.3 (l) (1997)).

Pennsylvania Codes, title 7, section 128.106, restricts the timing of pesticide applications in schools, elementary and secondary, and day care centers. It states that pesticides cannot be applied in "a common access area" of a school when students are expected to use the space within seven hours during school hours or organized extracurricular activities. "Common access areas" include areas where normal activity to "congregate, assemble or frequent."

Texas Structural Pest Control Board Regulations, section 595.11, classifies pesticides by their EPA toxicity category and are color coded, green, yellow and red. Each color represents different precautions and reentry times. Some Green List pesticides may not be applied when students are in the application area. All other Green List pesticides, Yellow list pesticides and Red list pesticides can only be applied 12 hours before students will be in the area of application. For outdoor applications, Green List pesticides can only be applied if students will be at least 10 feet from the application site. Yellow List pesticides can only be applied if students will be at least 10 feet from the application site for the following 12 hours. Red List pesticides can only be applied if students will be at least 50 feet from the application site for the next 12 hours.

West Virginia Legislative Rules, title 61 section 12J-7.1.3.c and 12J-7.1.4.c, require students and employees to remain out of application areas based on deferred levels of toxicity and application method. Level 3 pesticides require a four hour waiting period during which students and employees must remain out of treated areas. Level 4 pesticides require at least an eight-hour waiting period. Section 12J.9 states that employees and students of schools and day care centers must not be present at the time of a pesticide application, but that "pesticides may be applied to a localized area of infestation when students, children or school and day care center employees are present if the infestation causes an imminent threat of bodily harm" (W.VA. CODE ST. R. tit 61 § 12J.9.1 (1996)).

Integrated Pest Management

OVERVIEW

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, and 4) utilizing pest suppression techniques, if necessary, that are based on mechanical and biological controls. An IPM policy should include a written policy guide and a prohibited and acceptable materials list. Materials that could be considered after using other methods include boric acid and disodium octoborate tetrahydrate, silica gels, diatomaceous earth, nonvolatile insect and rodent baits in tamper resistant containers or for crack and crevice placement only, microbe-based insecticides, botanical insecticides (not including synthetic pyrethriods) without toxic synergists, and biological (living) control agents.

A strong 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. Many states have supporting material describing their IPM plan, which details the principles of IPM where the statute or law does not. Thirteen states define, recommend or require IPM in their state pesticide statutes or regulations. Of these, only five states (Connecticut, Maryland, Oregon, Texas, and West Virginia) require IPM in the schools.

Limiting when and what pesticides are applied in and around schools is important to the reduction of pesticide exposure.

Four states (Illinois, Louisiana, Maine, and Montana) recommend IPM, Florida, Massachusetts and Pennsylvania law define IPM, but do not require implementation of it in their schools. Michigan requires school pesticide applicators to be trained in IPM. Many of the statutes and regulations mandate that the specific details of the program be developed administratively. If you live in one of these states listed below, contact your school district or state government to see if and how IPM is being implemented. It is important to get a strong definition adopted for effective management.

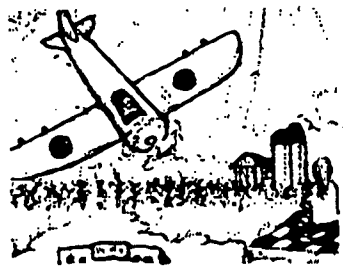
STATE OVERVIEW

Connecticut Pesticide Control Act, section 22a-66l of Connecticut General Statutes, requires the development of a policy for each state department, agency or institution to use IPM. The definition of IPM, found in Public Act No. 97-242, is vague and does not emphasize monitoring and other controls to eliminate pests. Connecticut Public Act No. 98-229 requires the Commissioner of Environmental Protection to prepare an IPM plan and right-to-know feasibility study.

Florida Statutes, chapter 482, section 021(14), defines IPM to maximize use of naturally occuring pest controls. Not required to be used in schools.

Illinois Structural Pest Control Act, section 235/3.25 of the Illinois Compiled Statutes, has a very thorough definition of IPM. The act defines IPM as "a pest management system that includes the following elements: a) identifying of pests and their natural enemies; b) establishing an ongoing monitoring and record keeping system for regular sampling and assessment of pest and natural enemy populations; c) determining the pest population levels that can be tolerated based on aesthetic, economic, and health concerns, and setting action thresholds where pest populations or environmental conditions warrant remedial action; d) the preven-

tion of pest problems through improved sanitation, management of waste, addition of physical barriers, and the modification of habitats that attract or harbor pests; 5) reliance to the greatest extent possible on nontoxic, biological, cultural or mechanical pest management methods, or on the use of natural control agents; 6) when necessary, the use of chemical pesticides, with preference for products that are the least harmful to human health and the environment; and 7) record keeping and reporting of pest populations, surveillance techniques, and remedial actions taken (225 ILL. COMP. STAT 235/3.25 (1997)). Section 235/10.2 of the Structural Pest Control Act requires the Department of Public Health to prepare IPM guidelines for school buildings and property. The schools are then encouraged to adopt these guidelines and have a designated person, a specialist, to oversee the implementation in the school. It also states that the Department of Public Health may develop a training program for the designated specialists.



Louisiana Pesticide Law, section 3382-3388 of the Louisiana Revised Statutes, discusses primary and secondary school pesticide safety by encouraging least toxic alternatives to pesticides. The law does not define IPM directly. Instead, "least toxic method is the integral part of an integrated pest management plan that may include pest control other than the application of pesticides" (LA. REV. STAT. § 3385 (1996)) and goes on to discuss the main points of an IPM program. Schools are encouraged to adopt "the least toxic method of pest control." Section 3386 of the law states that pest management at schools must be done by a trained IPM applicator. Annually, each school authority is to develop and submit a plan on how IPM will be implemented for school structures and property. This plan as well as a written record of all restricted use pesticides used is available to the public.

Maine Board of Pesticides Control, title 22 section 1471-X of the Maine Revised Statutes, includes ambiguous language regarding the state's IPM policy. Neither the laws nor the regulations specifically require or suggest that schools should adopt principles of IPM. The law and regulations do not define IPM. The law does state that "it is the policy of the State to work to find ways to use the minimum amounts of pesticides. The agencies of the State involved in the regulation or use of pesticides shall promote the principles and implementation of integrated pest management," and goes on to state that "these agencies, in cooperation with private interest groups, shall work to educate pesticide users and the general public in the proper use of pesticides and to determine other actions needed to accomplish the state policy" (ME. REV. STAT. tit. 22 §1471-X (1998)).

Maryland 1998 House Bill 286, entitled *Public Schools – Integrated Pest Management*, prioritizes non-chemical solutions, stating that IPM uses "one or more pest control methods including sanitation, structural repair, nonchemical methods and when nontoxic options are unreasonable or have been exhausted, pesticides" (1998 Md. Law 286 § (A)(6)). This law requires the Maryland Department of Agriculture to develop uniform standards and criteria for implementing IPM and the county boards will then implement its schools procedures once approved by the secretary. A person is designated to maintain and make available information on the pesticides that may be used.

Massachusetts Code of Regulations, section 11.05(2)(h), defines IPM, giving equal weight to chemical pest management controls and the use of alternative pest control methods, while not addressing monitoring. For Vegetation Management Plans, applicants wanting to spray rights-of-way must submit to the department every five years, "a description of IPM programs or other techniques/programs to minimize the amount and frequency of herbicide applications" (333CMR §11.05(2)(h) (1996)). Although this does not directly include schools, it would be relevant if this type of area bordered school grounds. All plans must go through a public hearing and comment process. Massachusetts Pesticide Bureau in the Department of Food and Agriculture has produced a booklet on IPM, which includes a section on implementing IPM in school buildings.

Michigan has one of the weaker official definitions of IPM. For a pesticide application in schools, the applicator must be trained in IPM. Detailed elements of the training, found in Regulation No. 637 Pesticide Use, section 285.637.14 of the Michigan Administrative Code, are similar to the main methods associated with IPM, but does not give priority to non-chemical approaches.

Montana Model School Integrated Pest and Pesticide Safety Program Act directs the Montana Department of Agriculture to establish a model IPM program and encourages its adoption by schools and day care centers. Through this act, the Department in cooperation with the Montana Cooperative Extension Service and the Montana Model School Technical Working Group developed IPM program guidelines, as well as an IPM study manual for pesticide applicators in schools. IPM is not defined in the act but is defined thoroughly in the program guidelines and manual.

Oregon State Pesticide Control Act, section 634.660 of the Oregon Revised Statutes, defines IPM without giving priority to non-chemical pest management methods. The following agencies are required to implement IPM: "State Department of Agriculture, including the control of noxious weeds, State Department of Fish and Wildlife, Department of Transportation, State Parks and Recreation Department, State Forestry Department, Department of Corrections, Oregon Division of Administrative Services and each Oregon institution of higher education, for the institution's own building and grounds maintenance" (OR. REV. STAT. § 634.660 (1995)). A person is designated from

each agency to coordinate the IPM program for that agency. It also requires that each person responsible for pest management in each agency is trained in IPM.

Pennsylvania's definition of IPM,found in title 7 section 128.2 of the Pennsylvania Codes, does not give non-chemical pest control methods priority and does not discuss monitoring. There are no requirements or recommendations to use IPM in schools.

Texas Structural Pest Control Board Regulations, section 595.11, require each school district to adopt IPM policies and designate an IPM coordinator who has taken special IPM training courses. Each school board's adopted policy is on file with the district superintendent and IPM coordinator. Each policy must base its IPM definition on the one defined by the US EPA. The definition should include strategies that rely on the best combination of pest management tactics that are compatible with human health and environmental protection, use of non-chemical management strategies whenever practical and preferential use of least-toxic chemical controls.

West Virginia Legislative Rules, title 61 section 12J-3, defines IPM, but does not prioritize alternative pest control methods in its definition. Title 61 section 12J of the Legislative Rules also establishes procedures to provide IPM in schools and day care centers. The schools must then file plans with the Commissioner. The WV Department of Agriculture has produced an IPM guide for schools and other buildings.

Conclusion

If we do not want to harm or poison our children, our laws should reflect this. This review is intended to serve as a guide to move states and localities forward in their efforts to protect children. While the review shows that over half the states have taken some action, it describes limited action. Nearly half the states are silent on these critical issues. The federal government has neglected the entire issue and turned its back on children and the daily pesticide assault in the schools. The degree of state activity suggests a level of concern that can and should lead to increased protection in the future.

For information on the above discussed statutes and regulations, local governments and school districts that have passed school policies, and tools on how to get such policies at the state or local level adopted, please contact NCAMP.

Kagan Owens is information coordinator at the National Coalition Against the Misuse of Pesticides (NCAMP). Jay Feldman is NCAMP's executive director.

Endnotes

1 National Research Council, National Academy of Sciences, *Pesticides in the Diets of Infants and Children*, Washington, DC: National Academy Press, 1993.

2 The use of the word "address" casts a wide net of recommended and required activities. States include Arizona, Connecticut, Georgia, Illinois, Louisiana, Maine, Maryland, Massachusetts, Michigan, Montana, New Hampshire, New Jersey, Oregon, Pennsylvania, Texas, and West Virginia.

3 Calabreses, E.J., *Age and Susceptibility to Toxic Substances*, John Wiley & Sons, 1986; Natural Resource Defense Council (NRDC), *Intolerable Risk: Pesticides in Our Children's Food*, February, 1989; Spyker, J.M. and D.L. Avery, "Neurobehavioral Effects of Prenatal Exposure to the Organophosphate Diazinon in Mice," *Journal of Toxicology and Environmental Health* 3:989-1002, 1977; Paigen, B., "Children and Toxic Chemical" *Journal of Pesticide Reform*. Summer 1986.

4 Volberg, D.I., et al., *Pesticides in Schools: Reducing the Risks*, Robert Abrams, Attorney General of the New York State, New York State Department of Law, Environmental Protection Bureau, New York, March 1993: Bushnell, P.J., et al., "Behavioral and Neurochemical Effects of Acute Chlorpyrifos in Rates: Tolerance to Prolonged Inhibition of Chloinesterase," *Journal of Pharmacology. Exper. Thera.* 266(2):1007-1017, 1993.

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6 S.K. Hoar, et al., "Agricultural Herbicide Use and a Risk of Lymphoma and Soft-Tissue Sarcoma," *Journal of the American Medical Association*, 256(9):1141-1147, 1986: Wigle, D.T., et al., "Mortality Study of Canadian Farm Operators: Non-Hodgkin's Lymphoma Mortality and Agricultural Practices in Saskatchewan," *Journal of the National Cancer Institute* 82(7):575-582, 1990; Woods, J.S. "Non-Hodgkin's Lymphoma Among Phecoxy Herbicide-Exposed Farm Workers in Western Washington State. *Chemosphere* 18(1-6):401-406, 1989; Zahm, S.H., et al., "A Case-Control Study of Non-Hodgkin's Lymphoma and the Herbicide 2,4-dichlorophenoxyacetic acid (2,4-D) in Eastern Nebraska" *Epidemiology*. 1(5):349-356, 1990.

7 Gold, E. et al., "Risk Factors for Brain Tumors in Children," *American Journal of Epidemiology* 109(3):309-319, 1979; Lowngart, R. et al., "Childhood Leukemia and Parents' Occupational and Home Exposures," *Journal of the National Cancer Institute* 79:39, 1987; Reeves, J.D., "Household Insecticide-Associated Blood Dyscrasias in Children." (letter) *American Journal of Pediatric Hematology/Oncology* 4:438-439, 1982; Davis, J.R. et al., "Family Pesticide Use and Childhood Brain Cancer," *Arch. Environmental Contamination and Toxicology* 24:87-92, 1993; Leiss, J.K. and D.A. Savitz, "Home Pesticide Use and Childhood Cancer: A Case-Control Study," *American Journal of Public Health* 85:249-252, 1995.

8 Vasselinovitch, S.D., et al., "Neoplastic Response of Mouse Tissues During Perinatal Age Periods and Its Significance in Chemical Carcinogenesis," *Perinatal Carcinogenesis, National Cancer Institute Monograph 51*, 1979.

9 Material Safety Data Sheets are regulated by the Occupational Safety and Health Administration and detail the hazards of the product ingredients. MSDS's are sometimes limited by the fact that they are completed by the product manufacturer.

10 Restricted use pesticides is "determined by the U.S. EPA or a state agency. [It is] a pesticide which is available for purchase and use only by certified pesticide applicators or persons under their direct supervision. This group of pesticides is not available for use by the general public," as defined in *Farm Chemicals Handbook '98*, Willoughby, OH: Meister Publishing Company, 1998.

11 Although states in this category do not specify schools outright in its definition of lawn, school grounds are included. The 16 states in this category include Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New York, Vermont and Wisconsin.

12 The restricted-entry interval is "the time which must elapse after pesticide application before it is safe to enter the treated area without wearing protective clothing and equipment," as defined in *Farm Chemicals Handbook '98*, Willoughby, OH: Meister Publishing Company, 1998. "Safe" is loosely used here. The statutory standard is interpreted by EPA to allow for "acceptable risks."

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