School Pesticide Monitor

A Bi-Monthly Bulletin on Pesticides and Alternatives
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Behavioral Problems in Children Linked to Insecticides

A recent study in Canada finds that commonly used insecticides in homes and schools are associated with behavioral problems in children. The study investigates exposure to pyrethroid pesticides, used in more than 3,500 products, including flea and tick controls, cockroach sprays, and head lice controls, raising serious concerns about the impact of pyrethroids, which are increasingly used as a replacement for organophosphates.

The study, titled Urinary metabolites of organophosphates and pyrethroid pesticides and behavioral problems in Canadian children, published in the journal Environmental Health Perspectives, uses data from the Canadian Health Measures Survey (2007-2009).

Researchers analyzed organophosphate and pyrethroid metabolites in the urine of 770 Canadian children between the ages of 6 and 11. Each parent was also asked three questions about their use of indoor pesticides, pyrethroid pesticides, and outdoor pesticides within the last month. The study found, "significant associations of high scores on emotional symptoms with use of pesticides for pets/head lice, and for any use of pesticides (either indoor, outdoor, or pets/head lice) in the past month."

Though only 14 percent of parents reported pesticide use in the last month, researchers Youssef Oulhote, M.Eng, PhD., and Maryse Bouchard, PhD., of Université de Montréal, found that 97 percent of children had traces of the pyrethroid metabolite cis-DCCA in their urine, while 91 percent of them had traces of at least one organo-

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Illinois to Improve Pesticide Restriction Enforcement

Illinois public health officials say that more than 200 Illinois schools and daycare centers have failed to comply with the most basic of the state's pest management regulations, and for the first time could face fines if they do not comply. According to the Illinois Department of Public Health (IDPH), the state's IPM regulations, including the requirements for reporting how pests are managed, are designed to protect children in daycare centers and schools from unnecessary applications of pesticides.

The Illinois Department of Public Health announced mid-November that it is ramping up its efforts to educate daycare centers and schools about the rules aimed at reducing and managing pests in light of widespread noncompliance with pest management regulations in public schools and daycare centers. State law requires public schools and licensed day care centers to file an Integrated Pest Management (IPM) form with the department to document how school officials plan to implement IPM. The state's Structural Pest Control Act (Act), [225 ILCS 235] requires public schools and licensed day care centers to, when economically feasible, develop and implement an IPM program and re-submit their plans every 5 years. Additionally, all parents, guardians, and employees must be notified at least once each school year that requirements have been met.

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. Generally, IPM is a program of prevention, monitoring, and control that offers the opportunity to eliminate or drastically reduce pesticides in schools, and minimize the toxicity of and exposure to any products that 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.

According to IDPH, over time, an IPM program can cost less than conventional pest management practices by reducing the school's or day care center's dependency on pesticides.

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Behavioral Problems

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phosphate metabolite. "This suggests that exposure events are common… [and that] although pyrethroids are assumed to degrade quickly by hydrolysis and photolysis, these processes might be considerably slowed indoors, thus leaving pesticides residues to linger and accumulate," the study says. The study concludes that with a tenfold increase in urinary levels of cis-DCCA, children are twice as likely to score high on parent-reported behavioral problems, including inattention and hyperactivity. Cis-DCCA and trans-DCCA, the breakdown products of pyrethroids are specifically traced to the pesticides permethrin, cypermethrin, and cyfluthrin.

A previous study among U.S. children researchers at the National Health and Nutrition Examination Survey (NHANES) examined the metabolites of pyrethroids in children below the age of six. Similarly, they found pyrethroid insecticides in more than 70 percent of the samples, concluding that children had significantly higher metabolite concentrations than those of adolescents. Together these studies demonstrate that exposure is widespread, with real impacts to human health.

Pyrethroids are known irritants and can have a high acute toxicity depending on the specific formulation. Pyrethroids have also been connected to multiple symptoms of acute toxicity, asthma, incoordination, tremors, and convulsions. In addition to human health effects pyrethroids are also persistent in the environment and adversely impact non-target organisms. A recent study found that residents of New York City are more highly exposed to organophosphates and pyrethroid pesticides than the average American. Another 2008 survey found pyrethroid contamination in 100 percent of urban streams sampled in California.

Mounting research on the impacts of pesticides to human health present a clear need for least-toxic management of homes, which effectively prevents the infestation of unwanted insects without the use of synthetic chemicals. These techniques include exclusion, sanitation and maintenance practices, as well as mechanical and least-toxic controls (which include boric acid and diatomaceous earth). Based on range of successful pest prevention practices, use of these hazardous chemicals are unnecessary.

Illinois

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"Integrated Pest Management is a means of managing pests that doesn't rely on a single method, such as the routine and often unnecessary application of pesticides," said Illinois Department of Public Health Director LaMar Hasbrouck, M.D. According to Dr. Hasbrouck, "It combines methods such as improved sanitation, monitoring, physical barriers and maintenance to reduce the likelihood of pest infestations. Facilities that practice IPM often see a reduction in the number of pests and pesticides applied, as well as a reduction in pest control costs."

An investigation found that school districts in Arlington Heights, Elmhurst, Oak Park and Harvey –along with special education districts in Highland Park, St. Charles, and Crescent City– are among those cited by the IDPH report for not filing IPM forms to document how the school or daycare center plan to control pests and the use of any pesticides. According to the IDPH, an IPM program "greatly reduces the chance of accidental exposure of pesticides to children and staff," and can help reduce the use of pesticides overall by promoting non-chemical methods –like better sanitation –to control bugs and animals. More than 90 day care centers in Chicago alone have been cited as non-compliant, along with another 124 day care centers located in the Chicago suburbs. A total 295 school districts and day care centers are cited by the state, with 242 in the greater Chicago area. The agency is now geared up to work to ensure schools and daycare centers comply by sending mass mailings, holding seminars, and working with the Illinois Department of Children and Family Services, which licenses Illinois day cares.

The Six IPM Program Essentials

1. **Monitoring.** This includes regular site inspections and trapping to determine the types and infestation levels of pests at each site.
2. **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.
3. **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.
4. **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.
5. **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.
6. **Evaluation.** A regular evaluation program is essential to determine the success of the pest management strategies.

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