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Environmental Health Professionals Work the Bugs Out—School Integrated Pest Management

Editor's Note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In this column, EHSB and guest authors from across CDC will highlight a variety of concerns, opportunities, challenges, and successes that we all share in environmental public health. EHSB's objective is to strengthen the role of state, local, tribal, and national environmental health programs and professionals to anticipate, identify, and respond to adverse environmental exposures and the consequences of these exposures for human health.

The conclusions in this article are those of the author(s) and do not necessarily represent the views of CDC.

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Parents send their kids off to school believing that their children will be in a safe learning environment. This academic year, 50 million students are attending public K–12 schools, with an additional five million attending private schools. Including staff, more than 60 million people are in the U.S. school community, which is an equivalent population to that of the UK or Italy. This body of humanity spends a significant por-

tion of their day in our 98,300 public schools (13,600 school districts), and 30,900 private schools. So it's not surprising that the quality of the school environment influences the health and well-being of those inhabiting the facilities. Yet children continue to face risks from pests and unnecessary pesticide exposure in schools.

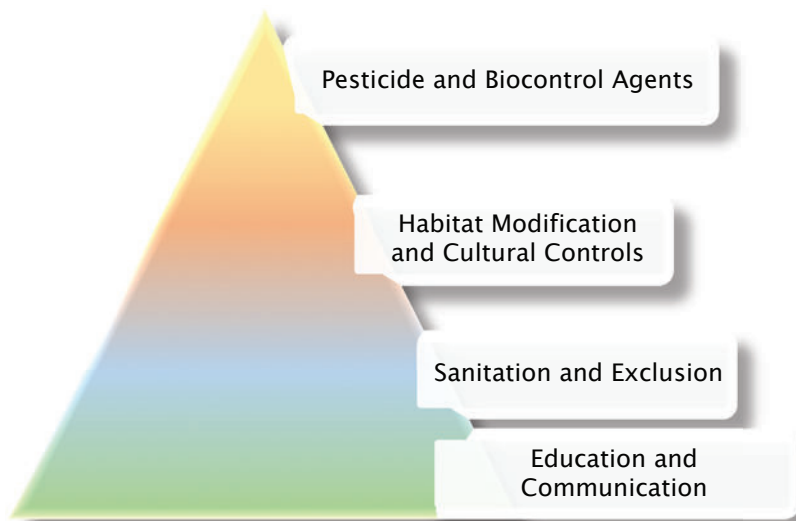
In 2012 the American Academy of Pediatrics (AAP) issued a policy statement address-

ing pesticide exposure in children (Roberts & Karr, 2012). While it is well established that children are more vulnerable to the effects of toxicants (National Research Council, 1993) and both children and school employees experience illness due to pesticide exposure in schools (Alarcon et al., 2005), the AAP statement highlights current risks to children, offers solutions, and demands action to be taken. The authors cite epidemiologic evidence associating early life exposure to pesticides with pediatric cancers, decreased cognitive function, and behavioral problems. AAP recommends actions to reduce the risks from pesticides by advocating policies that promote integrated pest management (IPM), comprehensive pesticide labeling, and marketing practices that incorporate child health considerations.

Well-managed school districts are practicing IPM to reduce risks related to pests and pest management practices and the benefits of school IPM are clear. Gouge and co-authors (2006) documented that schools implementing high-level IPM averaged a 71% reduction in the number of pesticide applications and a 78% reduction in pest complaints. School districts practicing IPM have lower chances of pest-related exposure; IPM reduced the incidence of roving bed bugs by greater than 75% in an inner-city high school district in Arizona. High-performing school districts demonstrate a high level of emergency preparedness when it comes to vectorborne disease and pathogen-related illnesses. In 2003 Arizona school staff involved in IPM programs were well prepared for West Nile virus (WNV) as it moved west across the coun-

FIGURE 1

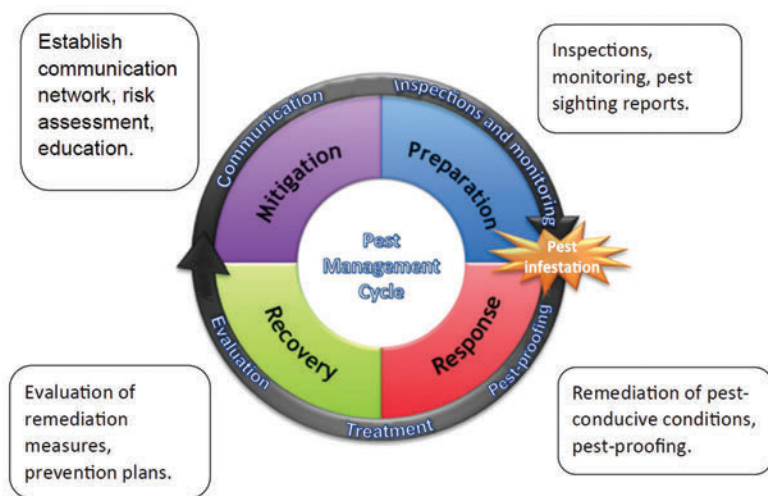
Integrated Pest Management Pyramid



The foundation of integrated pest management is education and communication, while sanitation, maintenance, and pest exclusion measures, manages, or prevents the bulk of pest issues. The safest, most effective pesticides or biocontrol agents are used when necessary.

FIGURE 2

Pest Management Cycle: Integrated Pest Management Is a Dynamic Investigative Process



try. IPM districts were actively monitoring grounds for mosquito breeding sites and were some of the first to submit mosquito samples positive for WNV in the state. Their response was well planned and included education efforts for local communities. Reducing risks associated with pests and pest management practices also reduces litigation risks.

Many school IPM efforts are led by the district custodial, maintenance, and food-service managers because sanitation and site maintenance are so critical to preventing pests. Still, the vast majority of school districts contract with pest management companies for pest management services. But according to survey work conducted in North Carolina by Nalyanya and co-authors (2005), pest management companies may report IPM practices in schools but apply pesticides on a predetermined schedule, which is contrary to the principles of IPM. The authors concluded that the pest management professionals surveyed did not practice rigorous IPM.

As with the broader field of environmental health, IPM is science based. It is also a decision-making strategy that aims at establishing the safest, most effective pest management practices (Figure 1), which consider the ecology of pests in the target environment. In other words, it's plain common sense. Outmoded exterminator pest control relies on the repeated application of pesticides, whether needed or not. When infestations occur the emphasis is on additional pesticide applications, while IPM efforts center on monitoring and identification of pests, and correction of pest-conducive conditions (Figure 2). When pests show up, action is taken to fix the fundamental reasons why the pests are present.

State school pest management regulation is often pesticide centric and mostly devoid of sanitary rule. Thirty-five states have approved specific restrictions on pesticide use in schools and 38 states in child-care facilities (Hurley et al., 2014). While the pest management industry continues to make advances and improve standards, it's unlikely that school districts can rely entirely on traditional pest management contractors to establish verifiable IPM, particularly when most preventive actions are accomplished through sanitation, maintenance, and daily monitoring by school staff.

Environmental health practitioners (EHPs) represent some of the very few regulators man-

What You Can Do

1. Get connected to regional, state, and tribal programs: www.epa.gov/opp00001/ipm/ipmcontacts.htm#region9
2. Get informed: www.neha.org/index.shtml
3. Get the message out there. Encourage IPM implementation through education both on the job and at home. Ask your child's school district how they manage pests. Integrate IPM into the 10 Essential Public Health Services that describe public health activities that all communities undertake: www.cdc.gov/nphsp/essentialservices.html

dated to visit schools and thereby influence schools to implement better IPM practices as part of their normal education and enforcement activities. Everyday connections to pest

management can be made about conditions conducive for pathogens caused by improper cleaning or maintenance. We often state that "pest management is people management," and by linking IPM to the best management practices critical to environmental health, EHPs can expand the thinking of school staff such that they understand how to support and DEMAND better pest management. 🐞

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