



Integrated Pest Management in Tennessee's Schools?

Karen M. Vail

**Associate Professor, Department of Entomology & Plant Pathology
University of Tennessee, Knoxville, TN 37901-1071**

We all agree it is necessary to protect our children and other school occupants from unnecessary exposure to pest control products, while also ensuring they are not subjected to the health risks associated with pests. Integrated Pest Management (IPM) can accomplish this goal. IPM emphasizes regular inspecting and monitoring of pests in order to detect them at low population levels which is a better alternative than the scheduled spraying of pesticides. Information about the life cycle of the pest and its interactions with the environment are used to make a control decision. Most pests need access to food, water, air and shelter. By removing the basic survival elements or by blocking access into a structure, pest populations can be lowered or prevented from establishing.

Blocking access into the structure may be as easy as shutting doors when not in use; adding weather-stripping so doors close tightly; caulking and sealing openings in walls, especially around plumbing penetrations and wall/floor interfaces; installing or repairing screens; and pulling vegetation, shrubs and wood mulch at least 12-18 inches away from a structure to discourage occasional invaders as well as carpenter ants, termites and other pest species. Traps and vacuums are other less toxic tools that can be used to manage pests.

Pesticides may be necessary in an IPM program, but they should be used in a manner to minimize the risk of exposure to the occupants. The use of baits, dusts in wall voids and sprays applied in cracks and crevices should reduce exposure of pesticides to occupants.

The Tennessee Department of Agriculture requires any person applying pesticides on school system property to have a pesticide applicator's license or be under the direct supervision of a person licensed to apply pesticides. Therefore, teachers or

other occupants cannot bring or use pesticides inside schools unless they are under the supervision of a licensed operator and specifically granted permission by the officially designated IPM coordinator.

The following is strongly suggested as part of the IPM program:

- ! students, staff and parents should have access to a logbook which contains pesticide application records and other pest control services and information, including copies of labels and Material Safety Data Sheets (MSDS) used at each school;
- ! pest control services including pesticide applications should be recorded in a logbook prior to the next occupation of the building (before school starts the next day);
- ! this logbook should be kept in a central area that is easily accessible in each school;
- ! an overseer of the logbook should be appointed in each school;
- ! a predetermined waiting interval (or longer if indicated by the label) between pesticide application and student occupation of treated facilities should be adhered to;
- ! pesticide applicators should be educated and trained in the principles and practices of IPM and the use of pesticides approved for use in the school system; and
- ! all applicators must comply with the IPM policy and follow appropriate regulations and label precautions when using pesticides in or around school facilities.

Program Implementation

An IPM in Schools Program was initiated as a joint venture between The University of Tennessee and The Tennessee Department of Agriculture, Division of Regulatory Services in 1996. In the first year, the use of IPM in Schools was discussed at a meeting with the School Superintendent Executive Council and in a letter sent to all 149 public school systems and to all county and district extension offices.

Since then, the promotion of IPM in Schools has extended to many sectors of the community. Meetings were conducted with East and Upper East Tennessee Superintendents. Methods to reduce pesticide reliance in school buildings and landscapes and alternative methods for managing pests most commonly occurring in schools were discussed. Other topics covered included developing an official IPM policy statement, designating pest management roles, setting pest management objectives, inspecting site(s) and monitoring pest populations, applying IPM strategies to control pests, evaluating results and developing bid invitations for pest control services in public schools.

Our IPM program has been presented to 485 pest management professionals at six locations throughout the state and to 189 vocational agricultural teachers at their annual meeting. Over a thousand pest management professionals have learned about school IPM during Pesticide Applicator Training sessions which are held monthly in Knoxville and quarterly in six locations in the state. In addition, over 98 adult agricultural extension agents were trained in the principles of IPM in Schools at in-service trainings held in 1997. Every year Master Gardeners in selected counties are also introduced to this concept. Meetings have also been conducted for the School Plant Managers Association and The Tennessee Environmental Educators Association.

In addition to conducting meetings, The University of Tennessee Agricultural Extension Service publication PB1603, *Managing Pests in Tennessee Schools: Adopting Integrated Pest Management*, has been sent to all public and private, primary and secondary schools in the state.

Survey of Tennessee Schools

In May 1997, a survey was distributed to the 149 public school systems to determine the baseline adoption of IPM in schools. A second round of surveys was mailed in June to those school systems which had not responded to the first survey. A total of 110 schools responded giving a response rate of 74%. Respondents were requested to consult the contractor if answers to questions were unknown to them. The survey was modified from The Florida School Districts Integrated Pest Management (IPM) Questionnaire. Results that follow are responses to some of the questions posed on our survey.

Results

Results from the survey indicate much progress is needed to reduce the risk of unnecessary pesticide exposure to school occupants. Although 65% of respondents were concerned about pesticide exposure to school occupants, only 30% of schools claim they use IPM (Figure 1). This 30% is questionable because 77% (Figure 2) of the respondents indicated that pesticides were scheduled and sprayed on a monthly basis. Our estimates of IPM adoption were lower. If, according to the survey, schools indicated they used IPM, but also sprayed pesticides on a monthly basis, then they were classified as NOT using IPM. This lowered the percentage of schools using IPM to 12%. Based on the Department of Education's 1995/1996 annual statistical report on enrollment, schools using IPM account for about 34% of the children in Tennessee's school system. It was not surprising that only 19% indicated they had a pest management policy (Figure 3).

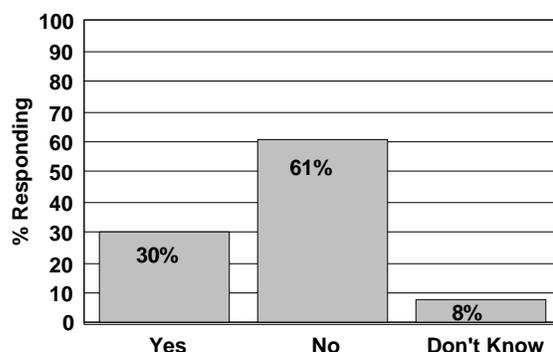


Figure 1. Does your school system currently use IPM to manage pests?

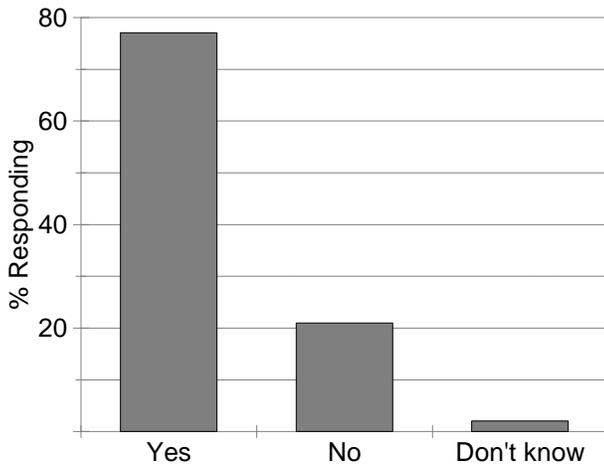


Figure 2. Does your school system apply pesticides on a regular schedule?

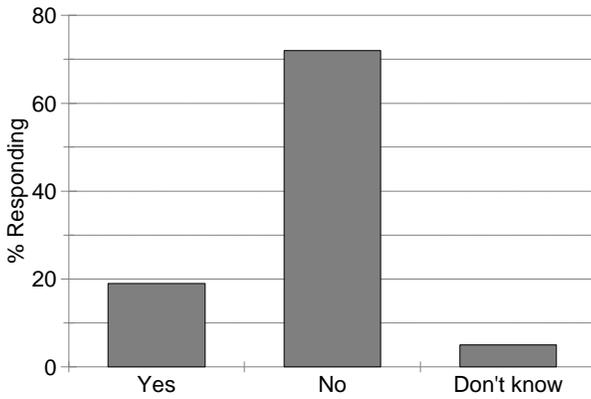


Figure 3. Does your school system have a policy statement about pest management?

There is still too much reliance on spraying and spot spraying of classrooms (79%); however, crack and crevice treatments (66%), which reduce potential exposure to occupants, were used second most often (Figure 4). Less than 35% used other pest management methods (vacuuming, dusting, baiting or capture devices) which ideally would reduce pesticide exposure. One in five schools still use foggers or thermal fog, although 19% never use aerosols or fogging. Even more discouraging is the fact that surface sprays are used all the time in 39% of the school systems. Food service areas receive the most intensive pesticide applications. Seventy-seven percent and 27% apply pesticides on a monthly basis and as needed, respectively, for the food service areas (Figure 5).

Grounds do not receive pesticides as frequently as indoor locations. Only 11% applied pesticides on a monthly basis to the grounds and 45% applied them as necessary to this area. Current legislation does not require a person to be under the

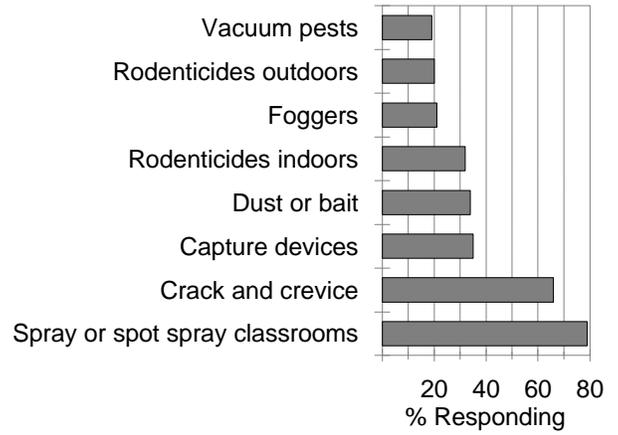


Figure 4. What materials and methods are used for pest management?

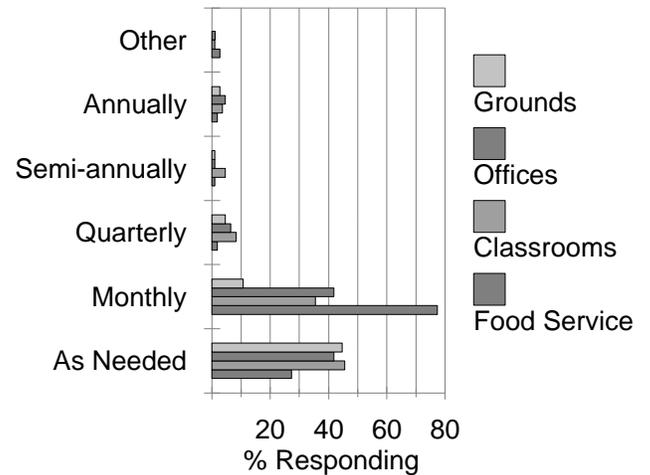


Figure 5. How often are pesticides applied in each area?

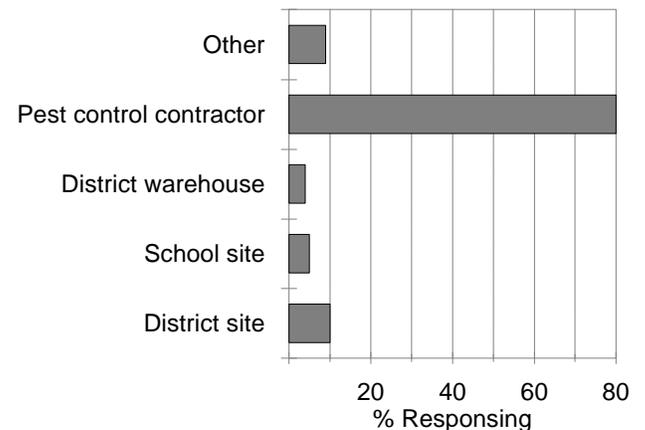


Figure 6. Where are pesticides stored?

supervision of a licensed operator if they are applying pesticides to grounds.

Pesticide storage was another concern that was addressed with this survey. While 80% used the pest control contractor to store pesticides, 19% stored pesticides either on-site (5%), at a district storage area (10%) or at a district warehouse with other items (4%)(Figure 6).

Our decision to target the pest control industry as a first step proved to be right on target. A majority of pest control services were performed by contracted firms - 76% use contracted services only, 14% use contracted and school personnel, and 9% use only school personnel for indoor pest control (Figure 7). Most information about pest management is obtained from the pest control contractor (75%), while the Agricultural Extension Service and vendors/manufacturers account for 27% and 26% of the information, respectively (Figure 8). The pest control technician is making the decisions of when and where to apply pesticides in 41% of the schools; however, the assumably untrained principal was responsible for 36% of these decisions (Figure 9). Almost 4 percent of the schools had an officially designated IPM Coordinator.

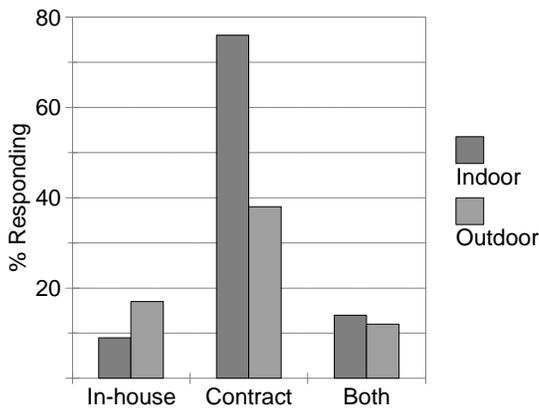


Figure 7. How does your school system perform pest control?

Respondents ranked pests from 1 to 10 (Table 1) with 1 being the most important. The following pests are listed with their mode (the ranking number chosen most often for that pest): cockroaches (1); head lice and ants/fire ants (2); rodents (3); spiders (4); wasps (5); and snakes, landscape pests, weeds and other (not ranked or 0). This was encouraging because the top 3 pests (excluding lice) can be managed

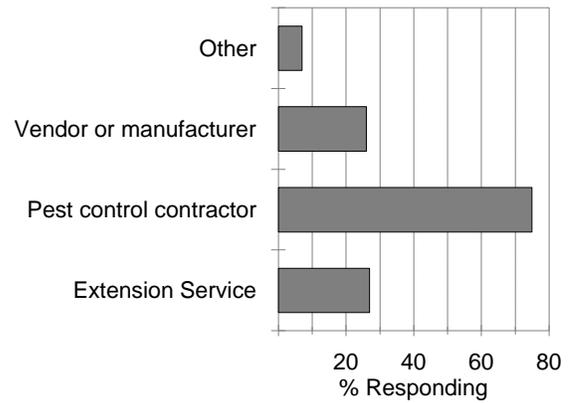


Figure 8. Where do you obtain information on pest management?

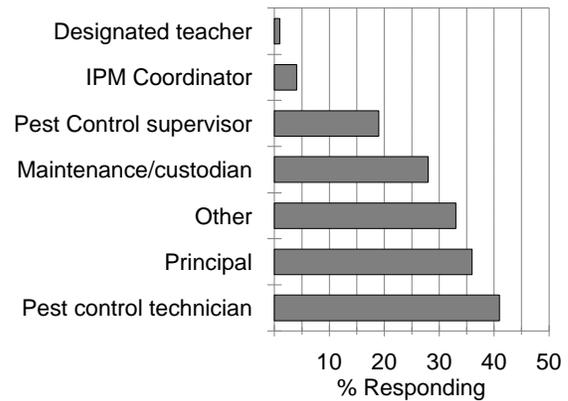


Figure 9. Who makes the pest management decisions?

Table 1. Ranking of 10 pests from most (1) to least (10) important in your school district.

Pest	Ranks (Mode)
Cockroaches	1
Ants or fire ants	2
Head lice	2
Rodents	3
Spiders	4
Wasp	5
Weeds	9
Landscape Problems	.
Snakes	.
Other	.

through exclusion and sanitation practices and baits, thereby reducing the unnecessary risk of exposure to pesticides.

Conclusions:

Schools need to be made more aware of this program. When school plant managers were asked why they thought IPM was not being adopted, they didn't have an answer except that they were unaware.

The pest control industry in general, which accounts for up to 90% of the pest control services conducted in Tennessee's, should not be blamed for the low rate of adoption because they have received training and should be aware of IPM. The low rate of adoption is probably due to the failure of administrators to adopt IPM. They often choose to accept low bids for pest management services regardless of services performed or the potential reduction in pesticide exposure to school occupants. Bid specifications are included in the manual (PB1603) which should have eased the transition into using IPM in schools.

A statewide school IPM advisory board was formed in November of 1999. Members are from the University of Tennessee School IPM (Chair) and Pesticide Applicator Training Programs; State Departments of Agriculture, Education, Health, Environment and Conservation (and Division of Comm. Assistance); State Board of Education; School Plant Managers Association; Tennessee Pest Control Association; Tennessee Parent Teacher's Association; and Tennessee Education Association. Also included are an environmental advocate and pest management professionals from rural and urban areas. By increasing the stakeholders involved in this program, we hope to increase the adoption of IPM.

Additional surveys have indicated an increase in IPM adoption. Phone calls were made in 1999 to those 10,000 or more student school systems that were classified as not using IPM to determine if their pest management practices had changed. Results of this phone survey reveal three additional school systems are trying IPM. Our latest estimates raise the percentage of children in schools using IPM to 38%.

While attempts have been made each year to increase awareness, the rate of voluntary adoption has been much slower than expected.

The Agricultural Extension Service offers its programs to all eligible persons regardless of race, color, national origin, sex, age, religion, disability or veteran status and is an Equal Opportunity Employer.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service, Charles L. Norman, Dean