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A Training Program for Cooperative Extension Agents: Implementation of Integrated Pest Management (IPM) in Virginia Public Schools

Dini M. Miller
Virginia Tech, dinim@vt.edu



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A Training Program for Cooperative Extension Agents: Implementation of Integrated Pest Management (IPM) in Virginia Public Schools

Abstract

A School Integrated Pest Management (IPM) training program was provided to Extension agents in Virginia. The training was designed to teach agents how to promote IPM programs for structural pest control in schools. Training focused on promoting the concepts of IPM and reducing indoor pesticide use. Post-training evaluations indicated that agents had received sufficient information to promote IPM in their counties. Twelve of the agent participants hosted School IPM training within their local school district(s). These local programs have resulted in 9 districts adopting IPM and thus improving the environmental quality of for 23,813 school employees and 166,319 students.

Dini M. Miller

Assistant Professor and Urban Pest Management Specialist
Virginia Tech
Blacksburg, Virginia
dinim@vt.edu

Program Concept

School administrators face tough questions from parents, students, and staff about pesticide use in and around school buildings. While many school administrators are reluctant to acknowledge that children may be exposed to pests at school, they are often more reluctant to discuss the issue of pesticide use because of the potential liability associated with exposure complaints. However, there is a philosophy of pest control for the school environment that eliminates both the real and perceived hazards of managing pests; it is Integrated Pest Management (IPM) (Greene & Breisch, 2002; Koehler & Scherer, 2002).

Integrated Pest Management is a process for achieving long-term, environmentally sound pest suppression through the use of a variety of least toxic management practices. Control strategies in an IPM program extend beyond chemical remedies to include structural and procedural modifications to reduce pest access and pest resources such as food, water, and harborage (U.S. EPA, 1993). The following four practices are applied simultaneously to manage pest populations within the school environment.

- Prevention of pest populations using monitoring, sanitation, and exclusion.
- Selecting the most effective and least toxic materials available for control of targeted pests.
- Application of pesticides only "as needed" for documented pest problems.
- Precision targeting of pesticides into pest harborages where they are accessible to pests but not to children, faculty, and staff.

There is a national movement to reduce childhood pesticide exposure. For this reason, School IPM as an alternative means of pest control is receiving federal attention (McKenna, 2001). Currently, there is a bill before Congress, the School Environment Protection Act 2003 (SEPA; H.R.121, 2003), which proposes to regulate pesticide use in locations (schools) where children might be exposed (Anonymous, 2003). Several states already have mandatory School IPM programs, e.g., Texas, Louisiana, Maryland, Pennsylvania, and West Virginia (McKenna, 2001).

However, many states are apprehensive about a mandated program because the school districts will not be provided with additional funds to learn about pesticide alternatives (IPM training). For this reason, many states are trying to avoid mandates by proactively establishing volunteer school IPM programs, e.g., California, Georgia, and North Carolina).

Several volunteer programs have achieved great success by using the infrastructure of the Cooperative Extension Service and state universities to provide IPM education and technical support to the local school districts (Florida, Pennsylvania, and North Carolina). This support facilitates the schools' transition from a monthly pesticide application schedule to a pest management program based on education and prevention (Koehler, Fasulo, & Scherer, 2002; Koehler & Scherer, 2002).

In July 2000, a pilot School IPM training program was launched in Virginia Cooperative Extension Planning District-4 (Montgomery, Giles, Pulaski, and Floyd counties and the City of Radford). The program focused on hands-on IPM training for Extension agents, their local school facilities managers, and contract pest control operators. The pilot program resulted in Montgomery County Public Schools (22 schools and 9,059 students) adopting an IPM program and implementing it with their contract pest control company (Miller, 2003). Montgomery is the largest school district in Planning District 4 and has been influential in leading other districts to adopt IPM.

The success of the pilot program resulted in funds from the Virginia Pesticide Control Board (Virginia Department of Agriculture) to expand the School IPM training to additional public schools throughout the state. However, statewide expansion of the School IPM program required widespread promotion to hundreds of school employees and pest control operators throughout Virginia. Therefore, it was logical that the expansion of the School IPM program be facilitated through the infrastructure of Virginia Cooperative Extension.

Agriculture and Natural Resource (ANR) agents were thought to be ideal for promoting and delivering the School IPM program for a number of reasons. Most ANR agents have established relationships with both the school administrators and the pest control operators in their counties. Many of these agents have been providing regular pesticide applicator training and environmental education as part of their Extension mission. However, most ANR agents in Virginia are only marginally familiar with indoor pest management techniques and have had no training in School IPM. Our goal was to provide this training so that we could use the Virginia Cooperative Extension network to promote the adoption of School IPM in Virginia.

Training Objectives

- Introduce agents to the problems inherent in current school pest control practices, and explain how these problems can be resolved using IPM.
- Familiarize agents with how the pilot IPM training program was initiated.
- Train agents how to demonstrate IPM strategies for specific pests.
- Provide agents with a protocol for introducing the IPM concept to their local schools.

IPM Training Procedures

A 2-day in-service training was presented to ANR agents in a public school facility. During this training, the county agents were taught how to promote and deliver a School IPM training program to their local schools. As part of the training, agents were given an overview of current pest control practices in Virginia schools and supplied with a copy of *Integrated Pest Management in Schools 2000* (Long & Kramer, 2000, unpublished), a report funded by the Virginia Department of Agriculture and Consumer Services (VDACS) in 2000. This report documented three major areas of concern regarding Virginia school pest control practices:

- Schools keep no records of pest problems or the pesticides applied on school grounds.
- Most school districts contract with a professional pest control company and receive monthly pesticide applications regardless of need.
- Many of the school employees who are responsible for outdoor pesticide applications on school grounds are not state-certified technicians (have not completed the state required pesticide safety training).

Introduction to IPM

As an introduction to the IPM program, we discussed with the agents how poor pest management practices leave school children vulnerable to accidental pesticide exposure and schools vulnerable to litigation. Agents were next familiarized with the methods of pest prevention used in an IPM program and how proper record-keeping coupled with pest prevention could eliminate needless applications of pesticide and potential exposure risk. The agents were provided with all introductory information in a notebook so they could return to their local school administrators and promote the IPM program.

Agents were also provided with PowerPoint training presentations that could be used for teaching IPM techniques. The presentations were explained in detail at the in-service so that the agents had a full understanding of the concepts presented: pest prevention, pest monitoring, reduced toxicity pest control methods, and how to keep records of pesticide applications and pest problems. Agents were encouraged to incorporate their own ideas and experiences into these School IPM presentations.

Part of the introductory training was presented by the Montgomery County Extension agent who took part in the pilot School IPM program. The agent discussed his experience working with the public school system and how he worked with the school facilities engineer to promote the adoption of an IPM program. The agent shared the pesticide safety training program he developed for school grounds maintenance personnel and related how he was able to provide the schools with the pesticide safety training they needed for state certification and compliance with state law.

The Facilities Engineer for Montgomery County schools was also invited to the in-service training to discuss his experience with the implementation of School IPM. The Facilities Engineer was able to address some of the questions that agents would receive from their local schools about developing an IPM pest control contract, selecting a pest control company, and how much an IPM program was going to cost.

Hands-On IPM Training

Agents participated in hands-on exercises to learn IPM techniques for specific school pests (cockroaches, ants, and rodents). The agents practiced monitoring for cockroaches in the school kitchen. They learned where and why sticky traps are placed in locations that are appealing to cockroaches and how to interpret trap catch for precision placement of cockroach baits. They also learned how to place cockroach baits so that they are accessible to the cockroaches but not to children and staff. Agents were also taught how to monitor for ants around school buildings and ant baiting techniques.

Another portion of the technical pest management training involved agents touring the school facility and learning to identify potential rodent entry points and how these locations could be modified to prevent rodent invasion. Finally, the agents returned to the classroom to discuss how to teach these techniques to school personnel and pest management professionals.

Promoting the School IPM Program

This portion of the workshop focused on the sequence of events that lead up to the IPM training session for school personnel. The agents began by identifying administrators and facilities managers who manage or supervise the pest control contract. In the rural school districts the superintendent or assistant superintendent typically oversees the district's pest control. However, in large urban districts pest control is supervised by facilities or grounds personnel. Therefore, we discussed how to best promote IPM to these different individuals.

Agents also engaged in a round table discussion about how to initiate IPM training for their local school district(s). The agents were provided with materials to assess and promote proper pest management practices in schools. Each agent was provided with a sample survey for documenting their local district's current pest control practices. They were also given a sample IPM policy statement, a School IPM pest control contract, and forms for recording pesticide applications on school grounds. These promotional materials, as well as an electronic slide presentation of IPM techniques for controlling cockroaches, ants, and rodents on school grounds, were provided for the agents to take to their local school board so they might generate interest in the IPM program.

It was our intention that after the School IPM training the Extension agents would return to their counties and begin working with the schools, introducing them to the School IPM concepts. Agents would have a complete introduction to the School IPM program and hands-on experience in using IPM techniques to monitor and control urban pests. Each agent would also be armed with a protocol for initiating a School IPM program in his or her school district(s) and a packaged IPM training program, complete with literature and electronic slide presentations.

The intended impact of this training program was to produce Extension agents who were trained to guide their school districts through the IPM implementation process. Our ultimate goal was to have these local schools adopt IPM and replace calendar-based applications of insecticide with an IPM program based on pest prevention and reduced pesticide use.

Measuring Training Impacts

To measure the impact of the agent training we continued to communicate with the agents after they returned to their counties. We kept a record of those agents who scheduled a School IPM program in their district and of course met with them face to face at the actual training sessions. In addition, we recorded the number of school districts that adopted an IPM program. Adoption of an IPM program was defined as rewriting the pest control contract to specify the use of IPM techniques to control pests or, if pest control was done in-house, that the plan of work was rewritten to specify the use of IPM techniques.

Impacts of the Agent Training School IPM Program

Extension Agent Short-Term Knowledge and Attitude Change

Participants in the School Integrated Pest Management program were examined after the IPM training to see how much of the IPM information they had understood and retained. In addition, the agents were surveyed to determine if they had received enough information and training materials to successfully promote an IPM program in their local schools.

The School IPM examination covered specific pest management techniques for cockroaches, rodents, and ants, as well as conceptual ideas such as the basis of IPM (pest prevention) and the use of the term "integrated" (controlling pest by using several techniques at the same time). Sixteen agents took the exam, and the average score on the post IPM training examination was 96%.

Listed below are the quantitative responses to the School IPM Training Evaluation Survey (8 questions total; 16 respondents).

- 81% indicated they received sufficient training to promote IPM in their local schools.
- 100% indicated that the laboratory sections helped them understand the IPM concepts.
- 81% gave the training IPM materials (notebook and CD) the top ranking of "very useful".
- 94% gave the overall IPM training program the top ranking of "very useful."

Respondents were asked to rank their interest in pursuing an IPM program in their local schools based on the IPM training. Rankings were 1-5, with 1 = very willing and 5 = not willing. Fifty percent of responded with a 1; 31% responded with a 2; and 19% responded with a 3.

The qualitative responses were related to what the respondents found the most/least useful about the workshop and what additional topics they thought should be included in future training sessions. Because our program focused on indoor pest control, several agents requested that outdoor weed control be included in the IPM information. There were also several requests for more information on wasp and bee control.

We received only three responses to the "least useful" question. All three mentioned the redundancy of some of the IPM information. Respondents listed the take-home presentations on CD and the hands-on laboratory sessions as the "most useful" portions of the workshop. Note: A CD-ROM covering IPM on Virginia school grounds has been funded by the EPA (2003) and is currently in development. Wasp and bee control information was added to the program in 2003 and is available on the Virginia School IPM Web site <<http://schoolipm.ento.vt.edu>>.

Long-Term Cultural and Practice Change

At the time of this writing, 12 of the agent participants in the School IPM training have successfully promoted and hosted School IPM workshops (full day) within their local school district(s). These programs have been presented to school administrators, facilities personnel, and pest control contractors. As of 2003, 1 year since the statewide expansion of the school IPM program, eight public school districts and one private school district have adopted School IPM, thus reducing their pesticide use and improving the environmental quality of their facilities. Table 1 indicates the number of structures and people that have benefited from adopting the IPM program.

Table 1.
Number of People and Structures Benefiting from IPM Program

| IPM School District or Program | Students | Employees | Buildings |
|---------------------------------------|-----------------|------------------|------------------|
| Buchanan County Schools | 3,604 | 533 | 21 |
| Chesapeake County Public Schools | 38,862 | 5,728 | 288 |
| Nelson County Schools | 2,030 | 360 | 5 |
| Norfolk County Public Schools | 38,000 | 5,500 | 62 |
| Montgomery County Public Schools | 9,236 | 1,602 | 30 |

| | | | |
|-------------------------------------|---------|--------|-----|
| Prince William Public Schools | 63,110 | 8,000 | 235 |
| VA Council of Churches-Head Start | 300 | 190 | 11 |
| Tazewell County Public Schools | 6,936 | 1,040 | 16 |
| Wythe County Public Schools | 4,241 | 860 | 13 |
| Total Virginia IPM School Districts | 166,319 | 23,813 | 681 |

Additional Impacts of School IPM Agent Training

Due to the efforts of the Montgomery county Extension agent in the pilot School IPM program, Montgomery County Public Schools and the Virginia School IPM program was cited as a model and a "catalyst for change" in *Safer Schools: Achieving a Healthy Learning Environment with Integrated Pest Management*, a national publication published by the School Pesticide Reform Coalition and Beyond Pesticides organization in 2003. The article included a full-page description of our IPM implementation strategies, with details on the pest-monitoring program and how to keep pesticide application records.

Discussion of Agent Training

In Virginia, pest control issues fall under the purview of the Agriculture and Natural Resource Extension agents. These agents deal predominantly with outdoor or agricultural insect pests. In fact, ANR agents are almost exclusively from a livestock or crop management background, but there are a growing number of ANR agents specializing in horticulture or weed science. However, there are currently no agents who specialize in indoor or urban pest management in Virginia.

Our challenge was to generate enough interest in indoor pest management and provide enough training to make the ANR agents comfortable with promoting the School IPM program. To do this we took a learner-centered approach where the agents were engaged in the educational process and assisted in developing the program content (based on a core curriculum) and activities that were to be presented to their local school districts. Also, each of the agents was expected to take an active role in delivering a portion of School IPM training when they scheduled training for their local schools.

We found that the 2-day in-service training at a school facility was a successful venue for conveying the School IPM program to the ANR agents. School IPM is a complex program with a number of detailed concepts and technical methodologies. Giving inexperienced agents the time to focus on learning a completely new set of concepts and skills required the removal of situational, institutional, and informational barriers.

The overnight in-service training removed agents from their busy schedules and offices so that they were able to be fully engaged in the learning process. Training at an actual school allowed the agents to visualize how the IPM practices would be applied. Finally, the School IPM information was provided in increments with extended periods for discussion and hands-on activities to encourage participation and learning.

The results of the agent training speak for themselves. The impacts of the program have been positive, with at least half of the agent participants promoting and hosting a School IPM program within a year of their own training. The post-training examination and program evaluation indicators also suggested that the agents had learned the material presented and were comfortable enough with it to promote School IPM on their own.

The development and promotion of any large-scale Extension program can be difficult, even when many of the agents are familiar with the subject area. However, we were able to determine from this School IPM program that with an appropriate amount of time and training, county agents can learn, promote, and contribute to complex programs that are outside their area of expertise. This ability to train Extension personnel how to promote and deliver novel programs is particularly important for preparing local stake holders to cope with potential federal mandates like School IPM.

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