

Fire ant management demonstrations increase school IPM adoption?

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Abstract. In 2009, the University of Tennessee Urban IPM Lab, in cooperation with UT Extension agents, undertook another strategy to increase integrated pest management (IPM) adoption in Tennessee's schools. To "get our foot in the door" in regards to increasing IPM adoption, fire ant management demonstrations were conducted on the grounds of at least one school in three school systems located in different Department of Education regions (Southeast, Upper Cumberland and South Central). Fire ants are a serious pest around schools; they are a medical concern due to their stings, can disrupt the learning environment and can interfere with electrical equipment. Ants/fire ants were the third most frequent pest reported and tied for second in the most troublesome category in the 2002 UT school pest management survey. Conducting the fire ant management demonstration prior to the indoor IPM program allowed us to demonstrate our commitment to managing and reducing risks from pests and pesticides at schools and establish a rapport with the school personnel, and provided a segue into an indoor IPM program. We intend to use the 2009 demonstration schools as IPM models for surrounding school systems in 2010 and subsequent years.

Issue. School IPM programs aim to reduce and balance risks from pests and pesticides to school occupants and the environment. Children spend considerable time at school and therefore increase their risk of pesticide exposure if pesticides have been applied in a manner inconsistent with IPM. Pests pose risks from venomous bites, disease transmission, allergic responses, equipment damage, and may disrupt the learning environment. IPM should achieve long term, environmentally sound pest suppression using a wide variety of technological and management practices. Control strategies in a child-serving facility IPM program extend beyond the application of pesticides to include structural, habitat and procedural modifications that reduce food, water, harborage, and access used by pests (<http://SchoolIPM.ifas.ufl.edu/>).

Justification. Why rural schools? In 2002, a school pest management survey mailed to all school districts in Tennessee had a 36% response rate. Although 63% of respondents were from rural areas, IPM was only used in 18% of the rural districts. We have created awareness of school IPM with just about every stakeholder group involved with pest management in schools, but personnel from rural schools have been among the most difficult to reach. Limited budgets (including travel budgets for meetings), personnel and time to deal with pest management make IPM adoption a challenge in rural areas. With this demonstration approach we have brought a school IPM program to the rural schools. Fire ants are a serious pest around schools; they are a medical concern due to their stings, can disrupt the learning environment and can interfere with electrical equipment. The "green" approach is used as an incentive for schools in urban areas to adopt IPM, and providing fire ant management advice may get rural schools interested in and involved with IPM.

Tennessee school pest management surveys conducted in 1997, 2002, and 2008 (http://eppserver.ag.utk.edu/School%20IPM/sch_ipm.htm) indicated that slow, but steady, progress is being made towards adoption of school IPM. In 1997, indoor school IPM adoption was estimated at 12% (74% return) and in 2002, it had reached 25% (36% return). In 2008, although only 6.7% of school districts completed the survey, 54% of schools used high IPM. It appears the rate of IPM adoption is doubling about every 5 years. With continued effort, we hope to have all schools using IPM by 2013.

Objective. This poster presents efforts to achieve one objective of our 2009 USDA Extension IPM Grant which has one of its ultimate goals of getting all Tennessee's schools using IPM. This one objective is to increase school IPM adoption in rural areas through (a) outdoor fire ant and (b) indoor IPM demonstrations.

Materials and Methods (a). Extension agents were contacted in Rhea, Cumberland and Moore Counties in the TN Department of Education rural school regions of Southeast, Upper Cumberland and South Central, respectively. Extension agents are expected to become the local pest management trouble-shooting experts in their counties. Either we or the county agents contacted each school system's facilities manager and inquired about schools with fire ants.



Figure 1. Broadcasting fire ant bait.

Fire ant baits were either applied as a broadcast application (Fig. 1) or an individual mound treatment (IMT). Fire ant bait was applied as listed in the figure captions for Cumberland County (Figs. 3-5), Moore County (Fig. 6) and Rhea County schools (Figs. 7-10). Mound activity was monitored by us or the agents at approximate two week intervals. At 6 weeks, all active mounds were treated with Amdro (hydrathemethyln) because school would be starting shortly thereafter (Fig. 2).



Figure 2. Bait individual mound treatment (IMT).

Results and discussion(a). While the Advion individual mound treatments were very effective at all schools (Figs. 6, 11 and 12), these fire ant demonstrations revealed the problem encountered with individual mound treatments. Mounds, typically smaller or flatter, are overlooked and not seen until after a rain or until they have grown larger and, thus, miss treatment. Broadcast applications of IGR (Extinguish, Distance), combination IGR/metabolic inhibitor (Extinguish Plus) or sodium-channel blocker (Advion) bait were slower than IMTs. However, past experience indicates that IGRs provide more long-term control by reducing the ability of newly mated queens to establish in these areas because workers are not killed and defend their territory.

When fire ant mounds are abundant, our recommendation is to broadcast a fire ant bait (IGR, or IGR/metabolic inhibitor or other) twice a year. With experience from this demonstration and thresholds developed in the extension web site, http://www.extension.org/pages/School_IPM_Action_Plan_for_Fire_Ants, a new publication describing fire ant treatment around schools will be developed.

One other problem was encountered with the fire ant treatments. As we left flags where fire ant mounds were found, school personnel were treating mounds around the schools. While we are encouraged that school personnel were scouting and treating for fire ants, this may have affected our results. Our treatments should have been noted in the school IPM log book, but some school personnel had not been informed of the manual and were unaware of our treatments. Also, because we often treated mounds late in the day, records of these application were emailed to appropriate individuals. But, these may not have been placed in the log book. This further emphasizes the importance of communication. All parties potentially involved with pest management should be educated and trained prior to any application. This encourages us to hold fire ant specific training for school personnel and others this winter. Most school personnel applying fire ant control products had not been trained in fire ant management or pesticide use. Tennessee law requires persons applying pesticides inside schools to be under the direct supervision of a licensed applicator, but this does not apply to outdoor applications.



Figure 3. Homestead Elementary of Cumberland County. All mounds Advion individual mound treatment (IMT). ■ indicates mound location.



Figure 4. Crab Orchard Elementary of Cumberland County. All mounds Advion IMT.



Figure 5. Stone Memorial High of Cumberland County. All mounds Advion IMT.



Figure 6. Moore County High of Cumberland County. All mounds Advion IMT. Two weeks after treatment, only one mound out of 34 was active (97.1% reduction).

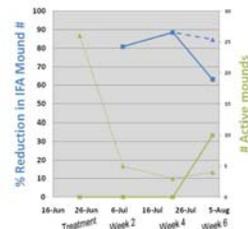


Figure 11. Percentage reduction and mound number of imported fire ants using all original mounds (triangles) and new mounds only (squares) individually treated with Advion in Cumberland County.

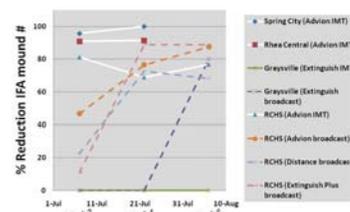


Figure 12. Percentage reduction in fire ant mound number at Rhea County. This includes the original mounds and the new mounds. Reductions pertaining to original mounds only would have been higher.



Figure 7. Rhea County High. Advion IMT (mounds 1-35); Distance broadcast to soccer field (35-64); Extinguish Plus broadcast (55-63); Advion broadcast (93-104); Advion IMT (all others).



Figure 8. Spring City Middle of Rhea County. All mounds Advion IMT.



Figure 9. Rhea Central Elementary. All mounds Advion IMT.



Figure 10. Graysville Elementary of Rhea County. Mounds in purple rectangle broadcasted with Extinguish in 14 ft band around swing set. Others Extinguish IMT.

Materials and Methods (b). School IPM workshops were conducted in Cumberland and Moore Counties in August of this year. We are still attempting to conduct a meeting in the Rhea County school system.



In the workshops, we described school IPM to kitchen, maintenance and custodial staff in these two school systems and discussed their roles.



To provide hands-on appreciation of the program, all attendees were given an IPM inspection sheet and an inspection was conducted of the high school cafeteria and perimeter.



A representative of each school was provided school IPM logbooks and asked to place these in the front office with a secretary.

Number of attendees at all school IPM workshops	Mean pre-training quiz scores	Mean post-training quiz scores
49	61%	82%

Results from a pre- and post-training quiz for all school IPM workshop attendees for all schools combined indicated a 21% increase in test scores or knowledge of IPM.



An inspection kit consisting of a flashlight, screwdrivers, telescoping mirror, spatulas, forceps, markers, zip-top bags, hand lens and glue boards was given to each school system to assist in their adoption of IPM.

In October, the first complete IPM inspection was conducted at a high school in each system with the pest management professional, a potential local technical IPM coordinator, a county agent, our staff and other school personnel. An inspection score for each site was calculated out of 500 points. We will alternate monthly inspections with monthly phone calls to keep apprised of the IPM in each school.

Results and discussion (b). Scores from the initial inspections reflected the age of the school. The older schools needed more structural repairs to reduce conducive conditions. The demonstration schools are well on their way to using high level IPM. In most cases, logbooks are being completed correctly, repairs are planned or have occurred, and communication is improving. We plan to use these schools as models for surrounding school systems and, if approved for future funding, will invite staff from surrounding school systems to observe IPM in action.

Partial support for this program was provided by an Extension IPM Grant.

