Measuring the Success of School IPM in Texas

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Introduction

Texas has one of the most comprehensive set of laws and regulations in the U.S. requiring public schools to use integrated pest management (IPM) for pest control. The law, which took effect in 1995, requires all Texas public schools to use less toxic pesticides and requires licensing of all applicators using pesticides on school district property. In addition, the law requires all schools in Texas to adopt a school board-approved IPM policy and to appoint and train a school district IPM coordinator.

We conducted a retrospective survey to evaluate progress in IPM awareness since implementation of the law. Prior to the law's implementation a statewide survey of IPM practices in Texas was conducted in 1993 (Shodrock, 1994). Our new survey was designed to evaluate progress since 1993 and study the impact of mandatory IPM legislation on pest control budgets, pest complaints, pesticide-related complaints, pesticide use, and other objective measures of IPM program success.

Results of the survey should provide useful information about the impact of mandatory school IPM legislation and its effectiveness in reducing pest and pesticide risks. This information should be useful to federal and other state legislators considering such legislation.

Materials and Methods

A twelve-page questionnaire was developed using elements of the Total Design Method (Dillman, 1978). The survey instrument consisted of multiple choice and open-ended questions. Some multiple choice questions asked for responses based on modified-Likert scales. The survey form was designed on Teleform® Designer (Cardiff Software, http://www.cardiff.com/products/teleform/index.html) then copied and bound in booklet form. Each survey carried a special identification number to facilitate tracking of completed forms.

A pre-notification letter was sent to school districts from the Texas Association of School Boards in October. Surveys were sent to 1,037 Texas school IPM coordinators in late November 2005. Surveys were sent to IPM Coordinators (if known) or the district Superintendent. Postage paid return envelopes were included with the survey and a school IPM training class discount was offered as a reward to all recipients who completed a survey.

A Fujitsu duplex scanner with automatic document feed was used to scan all returned surveys. The Teleform® software used optical character recognition to read results and send output to SPSS statistical software for analysis.

Results and Discussion

In 1993, Texas school districts were only slightly familiar with the impending school IPM law and were unsure how IPM would affect their district finances and ability to control pests. According to Shodrock, approximately 83% of the schools felt that mandatory IPM would negatively financially impact their district. Ten years later . . .

- 75.4% are "very" to "mostly" familiar with the current Texas laws and regulations governing pest control practice and pesticide use in public schools.
- 80.2% of coordinators are "mostly" to "very" familiar with the concept of integrated pest management.
- 98.3% of districts have a designated IPM Coordinator who oversees all pest management activities

68.8% of respondents correctly identified a correct definition of IPM [managing pests with multiple control tactics (including pesticides)]

Policy is an important part of school district governance. An IPM adopted by the school board indicates a commitment by the school district to establish IPM practice. Texas school districts went from 28% adoption of some form of IPM or pesticide use policy in 1993 to 92.3% adoption in 2005. School districts in states that do not have a mandatory school IPM law generally have a much lower rate of adopting IPM policies (Figure 2).

Under the Texas school IPM regulations schools must notify parents annually if they periodically apply pesticides and must develop a scheduled monitoring program, maintain records of pesticide use, pre-notification of pesticide applications and follow a 12-hour re-entry rule after most pesticide applications. Another state, California, recently codified the Department of Pesticide Regulation's existing voluntary school IPM program and added requirements for parental notification, use of warning signs, record-keeping and pesticide use reporting by all licensed pest control businesses that apply pesticides at schools. Texas policy adoption rates are higher than in California, where such requirements are more recent (Figure 3).

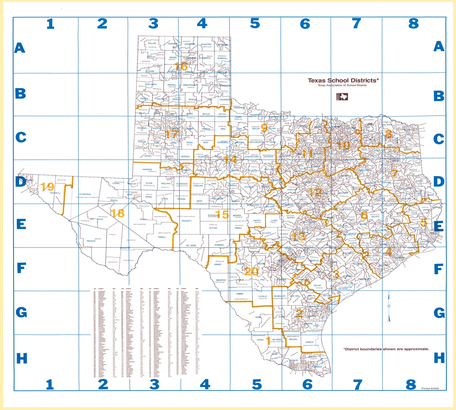
Eighty percent of respondents indicated they were familiar or "very familiar" with the concept of IPM; however when asked to choose among different definitions of IPM, fewer (68.8%) selected the most appropriate answer. Questions were also asked about pesticide use. In general, baits were used more frequently than pyrethroid insecticides for insect control, something the law was designed to encourage (Figure 4). In addition, non-chemical measures such as vacuuming, caulking and use of glue boards were generally used more often than many pesticides that are most commonly used by the pest control industry (Figure 5).

While IPM is considered a best management practice it is often linked to parental concerns and/or complaints from the community. Parents were less likely to make inquiries to the district about pesticide use in Texas compared to California (Figure 6).

Seventy-five percent of respondents felt that their adoption of IPM had resulted in more effective pest management for their district (10.2% felt it had made no difference). This compared to 49% of California school districts who thought their pest management (IPM) program had resulted in more effective pest management (California IPM, 2004).

Respondents indicated that the amount of money that their districts budget for pest control has not increased significantly since 1993 (Figure 7).

Figure 1. Boundaries of 1039 public school districts and 20 Educational Service Regions in Texas. Texas Association of School Boards.



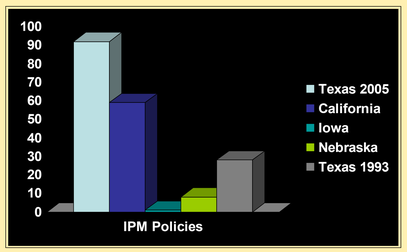


Figure 2. Percentage of school districts that have adopted IPM policies in Texas and other states (sources: California School IPM program, Univ. of Nebraska Cooperative Extension, Iowa State University)

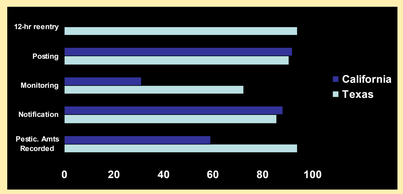


Figure 3. Percentage of school districts in Texas and California reporting adoption of various IPM-related policies and practices. (Additional source: California School IPM program)

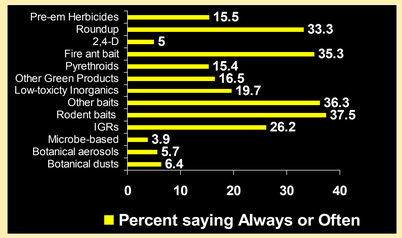


Figure 4 Percentage of school IPM coordinators using various pesticides always or often. Texas, 2005

Figure 5 Percentage of school IPM coordinators using various IPM tactics always or often. Texas, 2005.

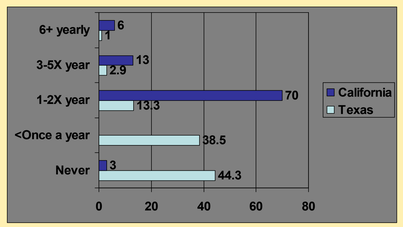


Figure 6. Annual number of inquiries from the public concerning pest management issues in Texas and California. (Additional source: California School IPM program)

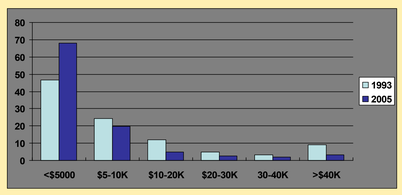


Figure 7. Estimated annual budgets for school district pest control programs. Texas. 1993, 2005.

Conclusions

Ten years after implementation of Texas school IPM laws and regulations, most districts have complied with state requirements, and school IPM coordinators have a better understanding of IPM. It is apparent, however, that there is room for improvement with respect to IPM understanding and implementation. Over 30% of respondents, for example, did not correctly identify the best definition of IPM.

While good baseline data for comparison is limited, it appears that the Texas law has reduced the amount of conventional residual insecticides in favor of baits and other, less-toxic methods. Only 15.4% of respondents indicated that pyrethroid insecticides are used "always" or "often" compared to 50% using caulks, 57% using rodent glue boards, 44% using insect sticky traps, 52% using vacuums and 36% using containerized or crack and crevice baits "always" or "often." Only 1-2% of respondents often used herbicides or insecticides bearing *Warning* or *Danger* signal words. High volume applications of insecticides, such as baseboard spraying or outdoor perimeter sprays, were used only "seldom" or "never" by 43.8% and 73.5% of districts, respectively. **When asked about changes in pesticide use, 75.4% said they thought they used less pesticides under IPM.**

When schools adopt IPM they generally achieve better pest control results. Among respondents, **75% felt they had achieved better pest control since adopting IPM.** Only 10.9% felt that there had been no improvement in pest control results. These responses were substantially higher than results from a survey of California pesticide applicators. This difference may be due to the longer time that the Texas program has run (10 years vs. California's 4 years), or may be due to training or differences in legal requirements between the two states.

Approximately 72% of respondents were mostly satisfied with their ability to manage indoor pest problems. Satisfaction was slightly lower (63%) for success in controlling weed problems. Only 10% of school districts do all their pest control in-house. There was a generally high satisfaction level among schools with their outside pest control contractors (86% mostly to completely satisfied.

Despite initial fears, there is no evidence that IPM implementation has cost Texas schools more money. In 1993, 68% of schools spent $5,000 or less on pest control compared to 46% in 2005. However, **55.2% of respondents said that they felt that IPM had reduced long-term costs of pest control.** Only 18% felt that IPM had increased the cost of pest control. When asked how the cost of pest control had changed over the past 3 years, nearly 50% said it had stayed about the same, compare to 32% who said it had increased. This suggests that despite rising costs of pest control for some districts, most coordinators do not attribute increases to mandatory IPM.

The widespread availability of training programs for schools is an important, yet often overlooked aspect affecting the success of IPM programs. Neither the Texas legislation, nor recent federal legislation, were funds appropriated for training or enforcement of school IPM regulations. In this study 80.3% of respondents had taken mandatory state IPM training. Nearly 50% of respondents received their training from the Southwest Technical Resouce Center for School IPM.

Acknowledgment

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