

In 1993, the California Department of Pesticide Regulation (DPR) began a program designed to provide school districts with information about integrated pest management (IPM) practices and to help them develop IPM programs for their schools.

The enactment of the Healthy Schools Act of 2000 (Assembly Bill 2260, HSA) gave increased significance

according to pre-established guidelines and treatment thresholds."

The act took effect on January 1, 2001. One year later, DPR conducted a survey to assess the progress made by schools. Of the 988 districts surveyed, 418 responded. The survey posed several key questions that elicited interesting feedback from school districts such as the following:

aware of DPR's school IPM program, and about 70 percent had adopted an IPM program. Adoption of an IPM program tended to be more prevalent in cities and towns than in rural areas.

At least 60 percent of school districts adopted the changes mandated by the HSA. These include posting warning signs at least 24 hours before and 72 hours after treatment, providing annual

into Practice

to DPR's efforts. This act added requirements for schools regarding pesticide applications such as notifying school site users, posting information, and maintaining records. The act also enhanced pesticide use reporting for licensed pest control businesses and directed DPR to provide school districts with school IPM information and resources through a website, school IPM guidebook, and training of school district staff.

As a department of the California Environmental Protection Agency, the DPR is charged with regulating the use of pesticides to ensure the protection of human health and environmental quality. It is the nation's premier state pesticide regulatory agency. In addition to regulating the sales and use of pesticides, DPR promotes the use of least-hazardous pest management practices in agricultural and urban settings, including the use of IPM in schools.

The HSA defines IPM as "a pest management strategy that focuses on long-term prevention or suppression of pest problems through a combination of techniques such as monitoring for pest presence and establishing treatment threshold levels, using nonchemical practices to make the habitat less conducive to pest development, improving sanitation, and employing mechanical and physical controls. Pesticides that pose the least possible hazard and are effective in a manner that minimizes risks to people, property, and the environment, are used only after careful monitoring indicates they are needed

1. Were school districts aware of DPR's school IPM program?
2. Were school districts aware of and using various informational resources provided by DPR and others that could help them manage pests in schools?
3. Have school districts adopted IPM programs, and what practices or policies have they officially adopted through board or administrative directives?

Perhaps the most **critical factor** for DPR to assess the extent to which school districts are adopting IPM programs was to determine the **pest management practices** districts actually use.

4. How do school districts determine when to treat for pests, and what practices do they use?
5. Among school districts that have adopted IPM programs, what has been their experience relative to the effectiveness and long-term costs of their pest management programs?

District Awareness and Adoption of an IPM Program

Nearly 90 percent of the responding school districts indicated they were

notification of expected pesticide use, maintaining a list of parents wanting to be notified of each application, and maintaining records of all pesticides used for at least four years. However, only about one in seven schools have a written policy requiring monitoring of pest levels, a key component of any IPM program.

Generally, survey results indicate that DPR's school IPM program is well recognized, and most school districts reported having some sort of IPM program. However, since considerable variation existed in adopted policies, results also indicate that most school districts do not have comprehensive programs. Although the HSA and IPM concepts are relatively new, survey results show that progress towards adopting IPM is being made on an incremental basis.

Awareness and Use of Information Resources

A wide range of resources is available to school districts to assist them in complying with the HSA and adopting practices that are consistent with an IPM program. The most commonly cited informational resources were licensed pest control businesses, brochures and handouts from DPR, DPR's school IPM website at www.schoolipm.info and IPM training programs such as the regional workshops offered through CASBO.

Making the Change to IPM

Perhaps the most critical factor for DPR to assess the extent to which school

districts are adopting IPM programs was to determine the pest management practices districts actually use. To examine this, DPR's survey focused on ants and weeds – two pests a 2001 survey identified as among the most troublesome pests in schools.

Management of Ants (Table 1). Most schools treat inside school buildings when ants are first noticed or when a certain number of complaints are received. The percentage of school districts that treat for ants at regular time intervals ("calendar spraying") – which is inconsistent with an IPM program – remained about the same as in 2001. One possible explanation for the continued use of calendar spraying is that some school districts find it easier to comply with the HSA's notification requirement by listing predetermined spray dates on the annual notification to parents. If this is the case, it is an unintended consequence of the HSA. Part of a sound IPM program

includes treating when the number of ants exceeds a pre-established threshold. The percentage of districts adopting this practice rose slightly.

Responses to questions about pest control methods used to manage ants in school buildings were encouraging.

The most frequently mentioned methods for managing ants inside school buildings were caulking in cracks, ant baits, and soapy water spray. In a separate question, districts cited ant baits as their single most frequently used technique. Nearly one in five districts

TABLE 1

When respondents decide to treat for ants inside buildings	2001 (%)	2002 (%)
At regular time intervals	16.4	16.1
When ants are first noticed	40.8	33.9
When number of ants exceed pre-established thresholds	9.9	12.8
After certain number of complaints by constituents	29.8	30.9
Other	3.1	6.3
Methods used to manage ants inside buildings	2001 (%)*	2002 (%)*
Insecticidal spray from aerosol can	n.a.	17.1
Insecticides sprayed using other application method	20.6	25.2
Ant baits	37.1	58.3
Soapy water spray	13.5	38.0
Caulk in cracks	19.0	63.5
Improved sanitation	n.a.	22.0
Other	13.2	35.9

*Percentage of total respondents to the survey.

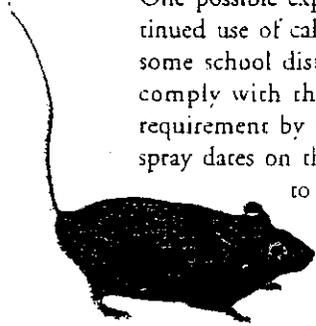


Table 2

When respondents decide to treat for weeds	2001	2002
	(%)	(%)
At regular time intervals	29.1	34.8
When weeds are first noticed	27.5	23.0
When weed abundance exceeds pre-established thresholds	33.9	29.5
After certain number of complaints by constituents	3.6	2.0
Other	5.9	10.7

What methods are used to manage weeds	2001	2002
	(%)*	(%)*
Regular broadcast methods of turf/landscaping with herbicides	27.2	22.8
Regular spot treatment of turf/landscaping with herbicides	62.4	61.4
Use of mulches	23.1	25.9
Physical controls (hand pulling, cultivating, mowing)	55.6	68.5

*Percentage of total respondents to the survey.

reported that they had improved sanitation as an IPM method for ants.

Overall, survey results indicate districts have made considerable progress with respect to pest management practices for ants. Fewer than 18 percent of school districts are reporting they used aerosol insecticides (not an IPM practice) as a method to control ants. School districts are reporting more use

of ant baits and other practices consistent with IPM.

Management of Weeds (Table 2). DPR found districts divided as to when they treat for weeds. The single largest group treats at regular intervals, but many treat for weeds when weed densities exceed some pre-established threshold, or when first noticed. Respondents indicating that they treat for weeds at

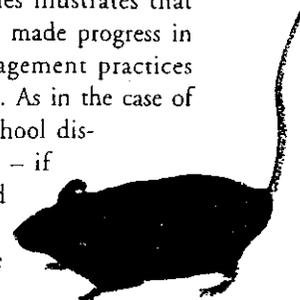
regular intervals rose in 2002, while treatment when weeds are first noticed and treatment when the abundance of weeds exceeded pre-established thresholds both declined.

When districts that have adopted IPM programs were asked to evaluate program effectiveness, the single largest group of respondents (41 percent) indicated that IPM results in more effective pest management.

The methods used to manage weeds changed somewhat from 2001 to 2002. In 2002, about one in five districts used broadcast application methods, an approach to be avoided in IPM programs, but this represented a decline from 2001. Herbicide broadcast methods are slightly more common in school districts that have IPM programs than in those that do not. As in the treatment for ants, these school districts may consider it easier to comply with the HSA's notification requirements by establishing spraying cycles for the year. Spot treatment of weeds might also require too much time in certain situations, such as severely infested athletic fields.

The use of physical controls (for example, hand pulling, cultivating, mowing) and the percentage using mulches rose in 2002. Physical controls and mulches are more often used in school districts that have IPM programs than in districts that do not.

Overall, the increased use of physical controls and mulches illustrates that school districts have made progress in adopting pest management practices consistent with IPM. As in the case of ant management, school district practices have – if anything – improved in complying with the intent of the HSA.



IPM Program Effectiveness and Costs

Another focus of DPR's survey was whether IPM programs resulted in more or less effective pest management, and whether a district's long-term costs of pest management have risen or declined.

When districts that have adopted IPM programs were asked to evaluate program *effectiveness*, the single largest group of respondents (41 percent) indicated that IPM results in more effective pest management, and another 19 percent are uncertain of its effects. About 20 percent of the respondents reported that their IPM program results in less effective pest management.

Results concerning the *long-term cost effectiveness* of IPM were mixed. About 28 percent of the respondents reported that their districts' IPM programs reduce the long-term cost of pest management, and a similar percentage reported increased long-term costs. Another 25 percent felt that the IPM program has no impact on long-term costs of pest management. These variations in responses reflect the inherent difficulties in measuring the costs of the preventive maintenance practices that are the cornerstone of a sound IPM program. Presented positively, more than half of the responding districts indicated that their IPM programs either reduce or have no impact on long-term costs.

Given that IPM is still in its early stages, and that most school districts do not appear to have comprehensive IPM programs in place, these findings are encouraging. Most school districts with IPM programs seem to believe that their programs are at least as effective and no more costly than past pest management programs. As the districts continue to develop more comprehensive IPM programs, they may improve both the effectiveness and efficiency of their practices.

Conclusions

From the results of the survey, it appears that improvements have been made by school districts engaging in practices that are consistent with sound IPM program activities. Whether they have IPM programs in place or not, school districts in 2002 kept more

records and used more sound IPM practices when treating for ants and weeds than they did when the HSA took effect.

Additionally, DPR found that districts that have adopted IPM programs generally adhere to IPM-compatible practices more than districts that have not adopted IPM programs. 'IPM' districts that keep more records related to pest management are more likely to use important information resources, use recommended treatment methods for

ants and weeds, and find IPM-based practices to be at least as effective and no more costly than their previous approaches to pest management. ■

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