Pest Management Practices

A Survey of Public School Districts in New York State

Lynn Braband, New York State Integrated Pest Management Program

New York State
Integrated Pest Management
Program

Acknowledgments

This report is dedicated to the memory of Curt Miller, NYS Department of Education, who helped develop the content of the survey. Curt was a tireless advocate for clean, healthy, and safe school facilities.

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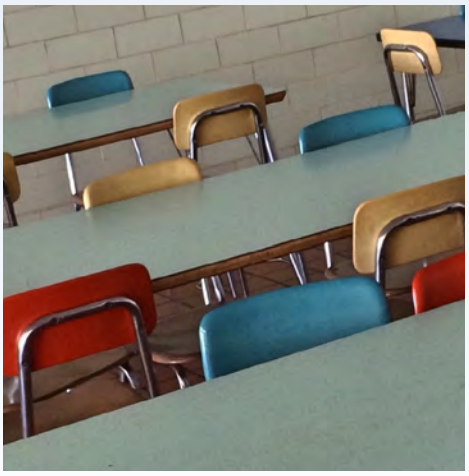


EXECUTIVE SUMMARY

In 2013, all public school districts and Boards of Cooperative Educational Services (BOCES) districts in New York State (NYS) were surveyed concerning their current pest management policies and practices. The goals of the survey were to evaluate the status of integrated pest management (IPM) programs in NYS public elementary and secondary schools, provide guidance for research and outreach activities to assist schools in improving pest management, gauge changes since a similar survey in 2001, and ascertain the impacts of the state's Pesticide Neighbor Notification Law (NNL) and the Child Safe Playing Fields Act (Laws of 2010, Chapter 85; hereafter referred to as Chap. 85).

Seventeen per cent (126) of the state's public school districts and BOCES districts responded to the survey compared to about 80% in the 2001 survey. Approximately 73% indicated that they had a written pest management policy, up from about 45% in 2001. Although increased over 2001, the majority did not have a pest management advisory committee. Most districts required inspections, monitoring, sanitation, record keeping, education, and pest exclusion in their pest management programs. Most districts did not have a policy concerning food outside of cafeterias.

In 2013, 34% of the school districts employed staff that were certified pesticide applicators. This was a drop from 50% of the districts in 2001. Most districts did not have regularly scheduled pesticide applications. Twenty-three per cent had regularly scheduled applications in instructional buildings and 9% in non-instructional buildings. These rates have changed little since 2001.

The most frequent and troublesome pests in NYS schools in both surveys were ants, stinging insects, mice, and weeds. Schools reporting goose problems increased from 14% in 2001 to 25% in 2013. In contrast, 24% of schools reported flies as a troublesome pest in 2001. This dropped to 12% in the 2013 survey. During the 2013 survey, the most frequent write-in response was poison ivy.

In 2001, the most commonly used structural pest management techniques were sanitation, vacuuming, monitoring/inspections, structural modifications, baits, and mechanical traps. Results were similar for the 2013 survey except for significant drops in the use of vacuuming and structural modification. Districts reporting baseboard spraying and crack/crevice applications as routine practices also dropped significantly. For management of school grounds, the most common techniques in 2001 were raising mower height, aeration, overseeding, and organic fertilizers. In 2013, schools increased their use of overseeding and aeration as routine cultural practices. Fourteen per cent of districts in 2013 indicated that they used minimum risk pesticides routinely, while 62% stated that these products are used infrequently.

In 2013, most NYS school districts received complaints about pests within the previous three years especially from school staff (81%). Two per cent or less had received complaints about pesticide applications during the same period.

The median total expenditure by school districts on pest control activities was $1,890 during the 2011-12 school year compared to $1,350 during the 1999-2000 school year. The means, respectively, were $12,516 and $4,330. Extrapolated, an estimated $9 million was spent statewide to control pests in schools during the 2011-13 school year compared to approximately $3 million in 1999-2000.

Almost 90% of the 2013 survey respondents indicated that they had not experienced any problems implementing the NNL, and almost 50% stated that the law resulted in a significant reduction in pesticide use by their school districts. During the 2011-12 school year, 66% of the respondents indicated that not over 10% of their districts' parents, guardians, and staff requested 48-hour advance written notice of pesticide applications. Approximately 35% of the respondents did not have anyone request 48-hour notification.

Almost 60% of the 2013 survey respondents indicated little impact of Chap. 85 since they had already implemented pesticide alternatives. About 22% stated a major impact and anticipated difficulty in maintaining quality of the grounds. Another 20% indicated moderate changes to their practices and that they were looking into pesticide alternatives. Since the law's enactment, 80% of the survey respondents had not requested an emergency pesticide application determination from their district school boards. Of those that made a request, the most frequent pest situation was lawn grubs, followed closely by weeds and stinging insects. Over 60% of the survey respondents indicated that the implementation of Chap. 85 had caused a reduction in pesticide use by their school districts.

Prominent needs that still exist concerning pest management in NYS schools include the pervasive issue of food in classrooms and other non-cafeteria locations. This highlights the need for increased, effective outreach to all school stakeholders. Aspects of NYS school pest management programs that may need further investigation include the reported drops in the use of pest siting logs, structural modifications, and vacuuming as pest management techniques. Also, future trends in the use of minimum risk pesticides by schools would be informative.

INTRODUCTION

Ascertaining the status of pest management practices in NYS schools is important for assessing needs and evaluating changes. Some NYS schools have successfully adopted IPM. However, other districts have had problems in adopting pesticide-reduction programs or still depend upon "conventional" pesticide treatments. In 2001, the NYS IPM Program, NYS Department of Health, and NYS Education Department comprehensively surveyed all public school districts, including Boards of Cooperative Education (BOCES) districts, in NYS on their pest management policies and practices (Braband et al. 2002). In 2013, the state's school and BOCES districts were resurveyed with the intent of gauging changes and obtaining information relevant to state laws implemented since the 2001 survey.

Jointly developed by the NYS IPM Program, NYS Department of Health, and NYS Education Department, the overall goal was to gauge the current status of pest management policies and practices in the state's public elementary and secondary schools, as well as to help focus outreach and research activities to better assist schools in managing pests while reducing the use of pesticides. Specific objectives included the assessment of the percentage of public school districts that:

- have an IPM program in place;
- communicate the program to various school constituencies;
- employ persons who are certified pesticide applicators;
- have had pest-related and pesticide-related complaints;
- apply various pest management strategies;
- are experiencing problems with various pests.
- Additional objectives were to gauge:
- changes from the 2001 survey;
- responses to implementation of the Pesticide Neighbor Notification Law and the Child Safe Playing Fields Act;
- the financial impacts related to pest management;
- barriers to IPM implementation in schools;
- sources of pest management information that districts use.

METHODS

In order to make comparisons, most of the questions in the 2013 survey (Appendix A) were similar to the 2001 survey. A few questions from the 2001 survey were deemed no longer relevant and dropped. Questions were added addressing the NYS Pesticide Neighbor Notification Law (Section 409-h of the Educational Law) and the Child Safe Playing Fields Act (Laws of 2010, Chapter 85), both which were enacted after the 2001 survey. Additionally, questions on square footage of district buildings and acreage of district grounds were added to be consistent with surveys in other states being coordinated nationally by the IPM Institute of North America (Zach Bruns, personal communication).

The administration of the two surveys varied. In 2001, the NYS Education Department mailed hard copies of the survey to all public school and BOCES districts in the state. The Education Department did a follow-up mailing to districts that did not respond to the initial mailing. Finally, the New York Agricultural Statistics Service of the USDA contacted by phone districts that had yet to respond and sought to survey them on the phone or faxed them the survey.

The 2013 survey was on-line at a website licensed to the NYS Department of Health. In January 2013, the NYS Superintendents of School Buildings & Grounds Association (now the NYS School Facilities Association) sent the link, with a cover letter (Appendix B), to its members. The NYS IPM Program researched and e-mailed the survey link to all districts that were not members of the school facilities association. As in 2001, school districts were assigned identification numbers in order to facilitate follow-up. In March, the NYS IPM Program mailed out reminder postcards. In July, a final call was e-mailed by the school facilities managers association.

The NYS Department of Health and the NYS IPM Program utilizing Statistical Analysis System (SAS) software analyzed survey data.

RESULTS

General Descriptions

We received 126 completed surveys. This number represents 17% of the 736 districts (699 school districts and 37 BOCES districts) in the state. In the 2001 survey, we received 603 completed surveys representing 86% of 741 districts (703 school districts and 38 BOCES districts). However, we did receive some duplicate surveys, probably less than 20, in the 2001 survey (Braband et al. 2002). Regionally within the state, we had similar rates of response in both surveys (Fig. 2). The percentage of respondents that classified their districts as rural, suburban or urban was also similar in the two surveys (Fig. 1). Outside of New York City which did not respond to either survey, all counties contained school districts that responded to the 2001 survey. In the 2013 survey, no districts responded from eleven counties (Cattaraugus, Cayuga, Chenango, Hamilton, Madison, Putnam, Seneca, Sullivan, Tompkins, Ulster, and Wyoming).

In the 2013 survey, the mean square footage of district buildings reported was approximately 450,000 square feet (Table 1). The mean acreage of district grounds was 1086 acres (Table 2).

Comparison of 2001 and 2013 Surveys

In 2001, 45% of the responding districts reported having a written pest management policy. This increased to approximately 73% of the respondents in 2013 (Fig. 3). In 2001, more than 70% of the responding districts required inspections, monitoring, sanitation and house keeping, and record keeping in their pest management programs, with fewer requiring education and pest exclusion (Braband et al. 2002). The question was more complex in the 2013 survey, but respondents reported high rates for all of the above components including education and pest exclusion which each increased from approximately 50% to 80% (Fig. 4).

Approximately 54% of the 2013 respondents reported that the district pest management policy has been explained to parents. This was double the rate reported in the 2001 survey. Communication of the pest management policy to students also doubled from 20% of the districts in 2001 to around 40% in 2013. Communication to after-school users changed little and stayed at 20% to 25%. In 2001, 60% of the respondents reported that the pest management policy was communicated to teachers and other district staff. This question was broken down to teachers, custodians, office staff, and administrators in 2013 with a response rate ranging from 66% for office staff to 84% for custodial staff (Table 3).

In 2013, most districts indicated that they do not have a policy related to food outside of cafeterias, and the percentage was approximately the same (and not significantly different) as in 2001 (Fig. 5). Of those that do have a policy, the most frequent aspect cited in 2013 was that food was not allowed outside of the cafeterias. However, some respondents indicated that it is not enforced. One wrote that, despite a policy prohibiting food in classrooms, students are allowed to do so "as a reward for good behavior." The percentage of 2013 respondents who reported that their districts have a pest management committee was double of the 2001 survey (Fig. 6). However, a large majority still does not. About 85% of the 2013 respondents have designated a specific individual as the district pest management contact, an increase of almost 20% (weakly significant at P=0.05 but not P=0.025) from 2001 (Fig. 7).

In 2001, less than 30% of responding districts indicated that they trained and encouraged building occupants to participate in the school's pest management program (Braband et al. 2002). This question was broken down by stakeholder group in 2013, with 85% of the respondents reporting that they train and encourage office staff, while student outreach was less than 20%. Outreach to other stakeholders (teachers, administrators, after school users) varied from 40% to 50% (Fig. 8).

The percentage of the responding districts that performed regularly scheduled pesticide applications in school buildings declined slightly, but not significantly, between 2001 and 2013 (Tables 4 & 5). In both surveys, the majority of the districts indicated that such applications are not done. When done, they are largely on weekends/holidays or during after school hours and most frequently on a monthly schedule.

Excluding Chap. 85 determinations, decisions concerning pesticide applications were usually made by the superintendent of buildings & grounds although private pesticide application firms, district superintendents, and school boards were each involved roughly 25% of the time (Fig. 10).

In both surveys, the most frequent and troublesome pests cited by NYS schools were ants, stinging insects (bees/wasps), mice, and weeds (Fig. 11). Schools reporting goose problems increased from 14% in 2001 to 25% in 2013 (Fig. 12). In contrast, 24% of schools reported flies as a troublesome pest in 2001. This dropped to 12% in the 2013 survey. During the 2013 survey, the most frequent write-in response was poison ivy.

In 2001, respondents indicated that they most commonly used the following indoor pest management techniques monthly or more often on a prearranged schedule: sanitation/housekeeping, vacuuming, monitoring/inspections, structural modifications, baits, and mechanical traps (Fig. 13). Responses were similar for the 2013 survey (Fig. 14).

However, vacuuming as a routine pest management tool dropped from 90% to 75% of the respondents, and structural modification dropped from 48% to 32%. Districts reporting baseboard spraying and crack/crevice applications as routine practices also dropped significantly.

In 2001, school districts most commonly listed the following techniques as being used infrequently (less than four times a year and not on a prearranged schedule): aerosols, baseboard spraying, crack/crevice applications, mechanical traps, baits, and structural modifications (Fig. 13). Responses were similar in the 2013 survey with aerosol/fogger use as an infrequent practice increasing from 85% of respondents to 100% (Fig. 14).

In the 2013 survey, but not in 2001, respondents were asked about their use of minimum risk pesticides. Fourteen per cent of districts indicated that they used these products routinely, with 62% stating that they are used infrequently (Fig. 14).

Based on the responses, schools increased their use of overseeding and aeration of turf and lawn areas as routine cultural practices and decreased (but not statistically significant, P=0.05) their use of soil testing (Fig. 15 & 16).

In 2001, 54% of the responding school districts indicated that they had received complaints about pests within the previous three years (Table 7). The 2013 survey asked this question separately for parents, staff, and students. The largest response was complaints by staff (81%) with the smallest being parents (44%). Six per cent of the 2001 respondents said that they had received complaints about pesticide applications within the same three-year period (Table 8). This decreased to not over two per cent in the 2013 survey. In 2001, four per cent indicated that there had been pesticide spills or complaints of health reactions to pesticides during the previous three years. None of the 2013 respondents indicated that these incidents occurred over a similar time period (three years prior to the survey).

In 2001, 50% of the school districts employed staff who were certified pesticide applicators (Table 10). In 2013, this had decreased by about 15%. The reported median annual pest management training per certified employee was six hours in 2001 and ten hours in 2013 (Table 11).

The median total expenditure by NYS school districts on pest control activities during the 1999-2000 school year was $1,350 (Braband et al. 2002). Based on the 2013 survey, the median total expenditure during the 2011-12 school year was $1,890 with the largest costs associated with contracted services, followed by employee labor, non-chemical pest control supplies, and employee training (Table 12). The mean total expenditure reported in the 2013 survey was $12,516, up from $4,330 in the 2001 survey. Extrapolated, approximately $9 million was spent statewide to control pests in schools in 2011-12 compared to around $3 million in 1999-2000.

Neighbor Notification Law

The 2001 survey was conducted before the school portion of the NYS Pesticide Neighbor Notification Law (NNL) became effective in July of 2001. Equal numbers (45% each) of school districts did or did not notify persons in parental relation and staff in advance of pesticide applications during the 2000-2001 school year (Braband et al. 2002). The remaining 10% were uncertain. Of those that notified, 62% accomplished this by posting at building entrances. Twenty-one per cent of the districts notified persons in parental relation and staff after pesticide applications. Of these, the most frequent means (59%) was posting.

In 2013, almost 90% of the respondents indicated that their districts had not experienced any problems implementing the NNL. Of those who did, one respondent each indicated that problems occurred with costs of mailings, issues with school administrators, and "geographical disparity of being a BOCES."

Thirty-seven per cent of the 2013 respondents indicated that the NNL resulted in a significant reduction in pesticide use by their school districts. During the 2011-12 school year, 35% of the respondents did not have anyone within the school district request 48-hour advance written notice of pesticide applications (Table 13). Another 26% of the districts had lists consisting of 25 or fewer people. Less than six per cent of the respondents had 48-hour notification lists larger than 200 people. On a percentage basis, 66% of the respondents indicated that not over 10% of their district's parents, guardians, and staff requested 48-hour notification (Table 14).

Child Safe Playing Field Act

In 2011, a NYS law (Laws of 2010, Chapter 85, commonly referred to as the Child Safe Playing Field Act) took effect that prohibits the use of most pesticides on school athletic and playing fields, playgrounds, and turf. Almost 60% of the 2013 survey respondents indicated little impact of the law since they had already implemented pesticide alternatives (Table 15). About 20% stated a major impact and anticipated difficulty in maintaining quality of the grounds. Another 20% indicated moderate changes to their practices and that they were looking into pesticide alternatives.

Since the law's enactment, 80% of the survey respondents said that they have not requested an emergency pesticide application determination from their district school boards. Seventy-five per cent of these stated that they do not have plans to seek determinations in the near future.

Seventeen per cent of the respondents had requested a determination. Of those that made a request, the most frequent pest situation was lawn grubs, followed closely by weeds and stinging insects. Determination requests were also made for poison ivy, European crane flies, and tent caterpillars. Ten of the survey respondents indicated that their requests to apply pesticides were granted by their school boards. One individual said that the request was not granted (and that he would "just let the weeds grow on our fence lines"). Nine others did not indicate whether their requests were granted or not.

Over 60% of the survey respondents indicated that the implementation of Chap. 85 had caused a reduction in pesticide use by their school districts. About 34% indicated that it had not.

Issues and Resources

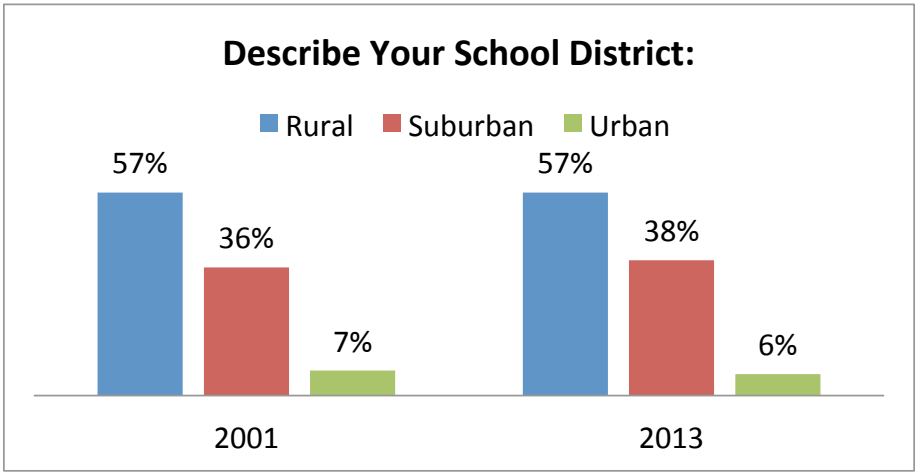
The most common problems that the respondents to the 2013 survey had in implementing IPM were food in non-cafeteria locations, frequent use of school property, constituency apathy and resistance, and the need for effective training and outreach (Table 16).

Survey respondents indicated that the most frequent sources of information on IPM were Cornell University (including Cooperative Extension), BOCES, state agencies, and contractors (Fig. 17). Other frequently cited sources were trade groups and journals, pesticide applicator courses, and the US EPA.

RESULTS, BY QUESTION Note: Question 1, School District ID numbers, is not published.

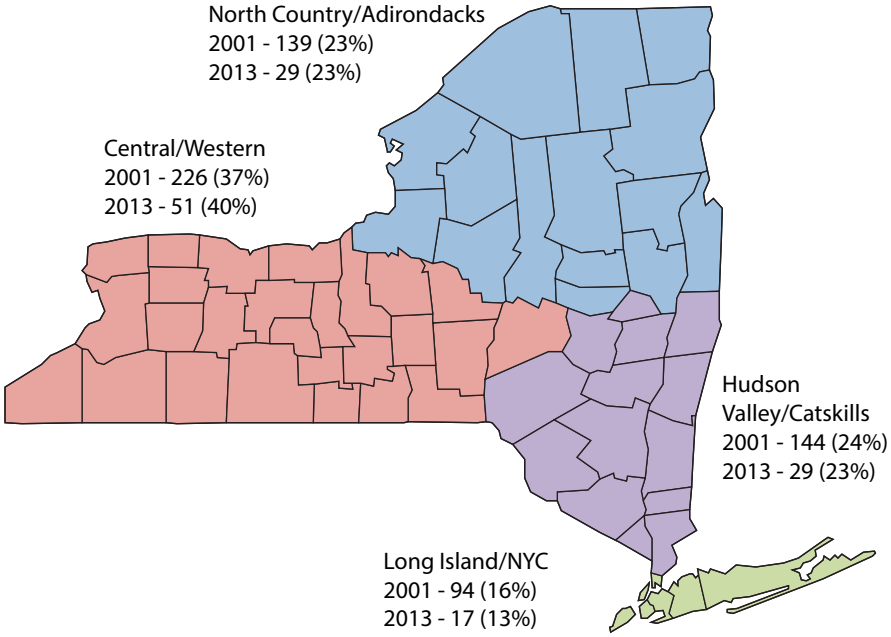
2. How would you describe your school district?

Figure 1.



3. What county is the school district located in?

Figure 2. Number and percentage of respondents; counties by region



4. What is the total square footage of school buildings in your district?

Table 1.

Total Square Footage of all School District Buildings	
Responses	191
Mean	455706.85
Max	7100000
Standard	712330.54

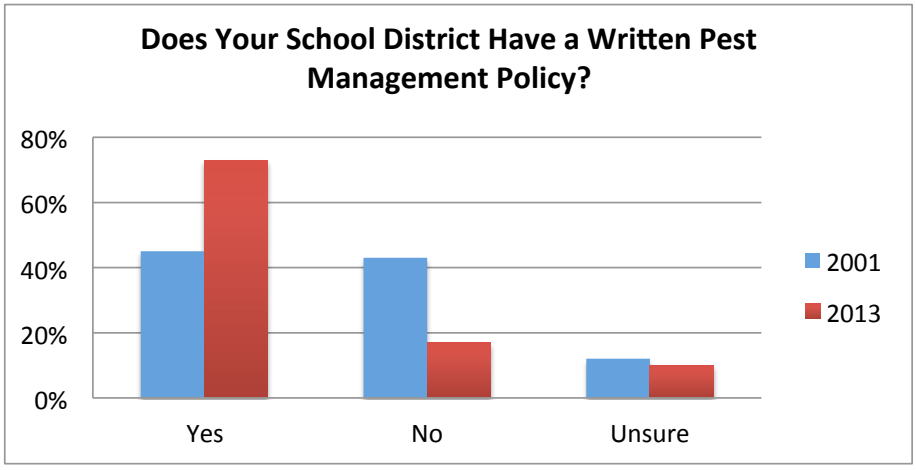
5. **What is the total acreage of all school grounds, including athletic fields, in your district?**

Table 2.

Total Acreage of all School District Grounds	
Responses	118
Mean	1085.58
Max	116,783.00
Standard	10,742.25

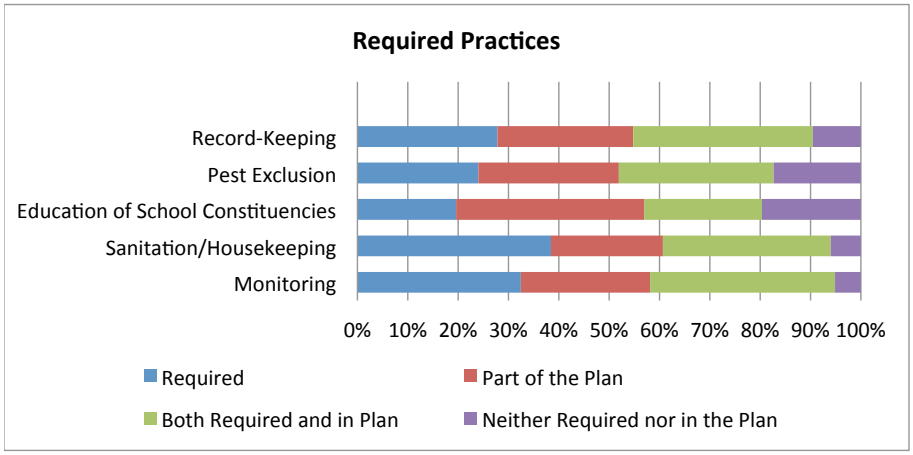
6. **Does the school district have a written pest management policy?**

Figure 3.



7. **Does the school disrict require the use of the following and are they part of the written pest management plan?**

Figure 4.



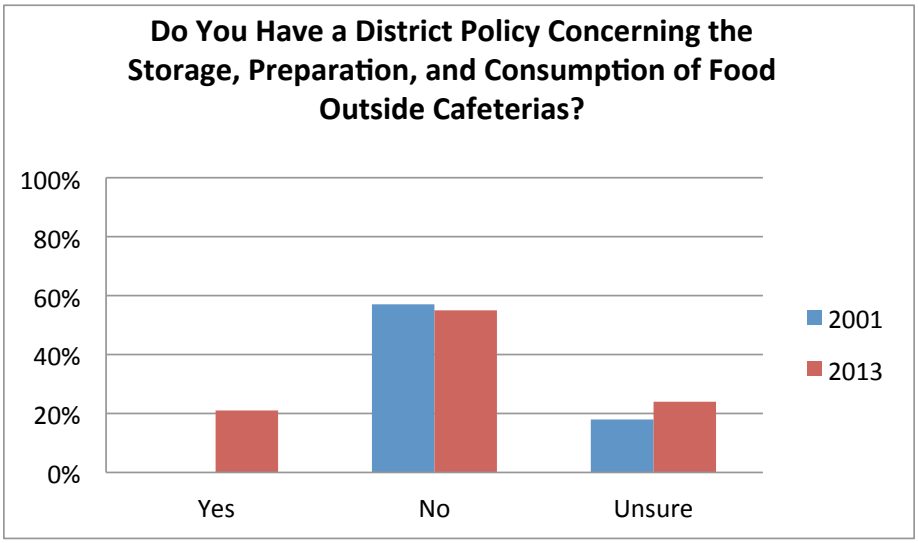
8. **Has the pest management policy been publicized and explained to the following? Check all that apply.**

Table 3. Note: 2001 question included all Teachers and Staff; in 2013, this question was broken down to four categories.

	Yes	No	Unsure
All Teachers and Staff (2001)	61.0%	25.0%	14.0%
Teachers (2013	65.5%	14.7%	19.8%
Custodial Staff (2013)	84.3%	7.8%	7.8%
Office Staff (2013)	66.1%	13.9%	20.0%
Administration (2013)	75.9%	10.3%	13.6%

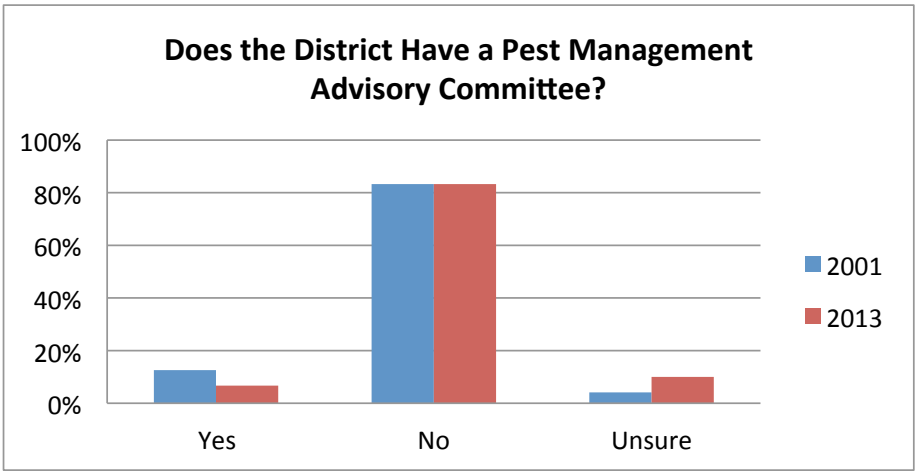
9. **Do you have a school district policy concerning the storage, preparation, and consumption of food outside of cafeterias?**

Figure 5.



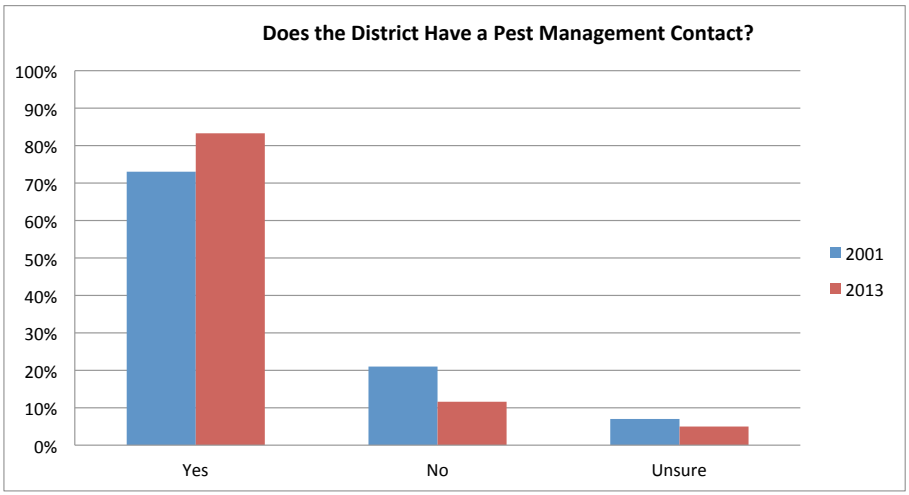
10. **Does the district have a pest management advisory committee?**

Figure 6.



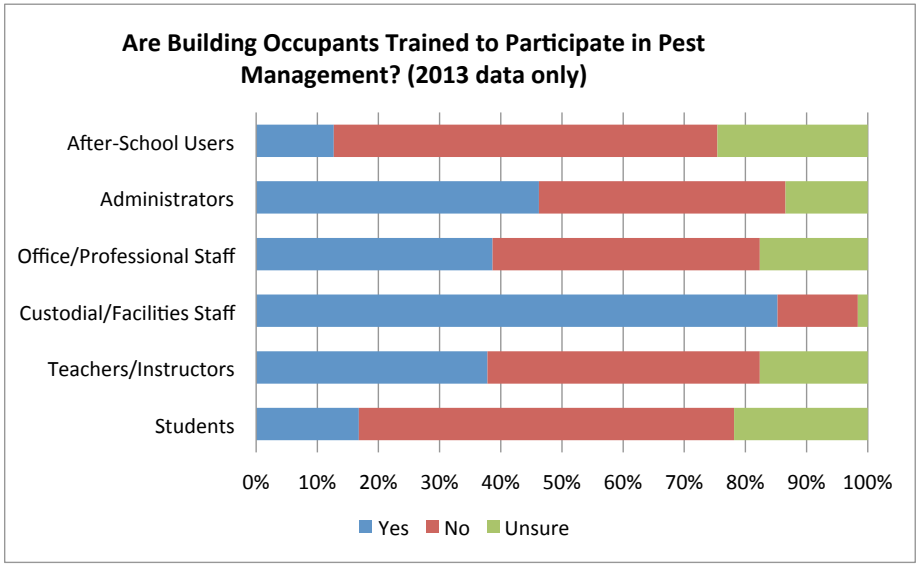
11. Has the school district designated an individual to be the pest management contact?

Figure 7. The Chi Square goodness of fit test P=0.05 suggests a statistically significant, if weak, difference between 2001 and 2013 data.



12. Are building occupants trained and encouraged to participate in the school's pest management program?

Figure 8.



13. Does the school district perform regularly scheduled pesticide applications in instructional school buildings?

Table 4.

	Yes	No	Unsure
2001	29.5%	69.0%	1.5%
2013	22.9%	76.3%	8.0%

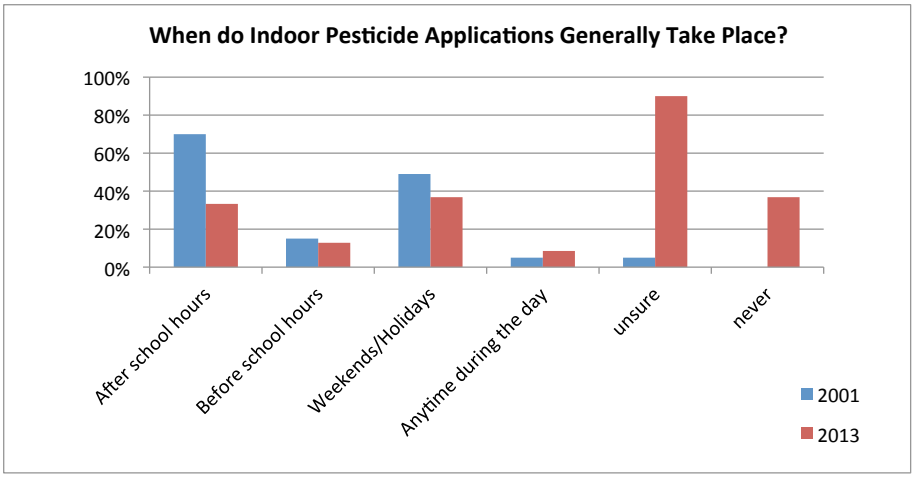
14. Does the school district perform regularly scheduled pesticide applications in non-instructional school buildings?

Table 5.

	Yes	No	Unsure
2001	10.8%	87.8%	1.4%
2013	8.5%	90.7%	0.1%

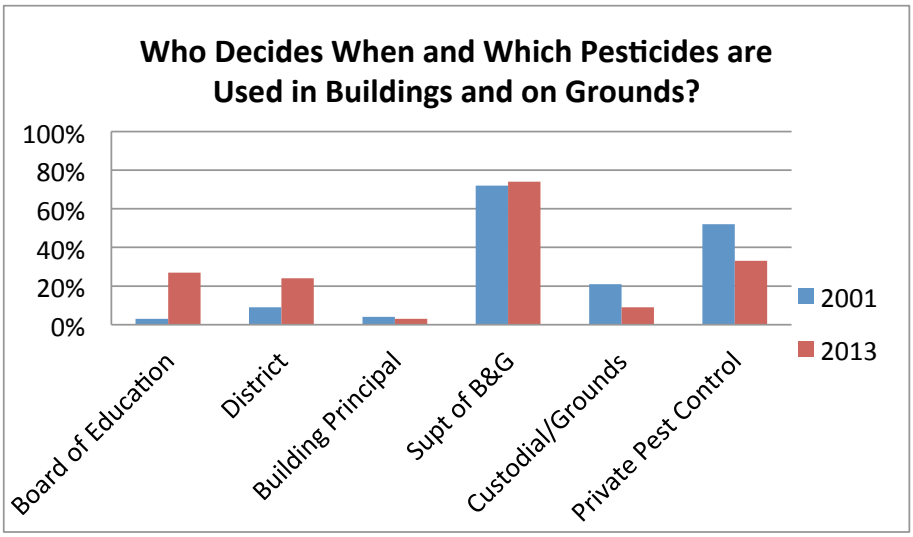
15. When do Indoor Pesticide Applications generally take place? Check all that apply.

Figure 9.



16. Who decides when and which pesticides are applied to school buildings or grounds (not including applications made to playgrounds, turf, athletic or playing fields that would require an emergency determination under Chapter 85 of the 2010 laws)? Check all that apply.

Figure 10. Strongly significant difference P=0.01 according to the Chi Square goodness of fit test.



17. Does the school maintain pest sighting records?

Table 6.

	Yes	No	Unsure
2001	61.7%	26.4%	11.7%
2013	41.2%	50.4%	8.4%

18. What have been the most frequent and troublesome pests within the pest three years? Check all that apply.

Figure 11.

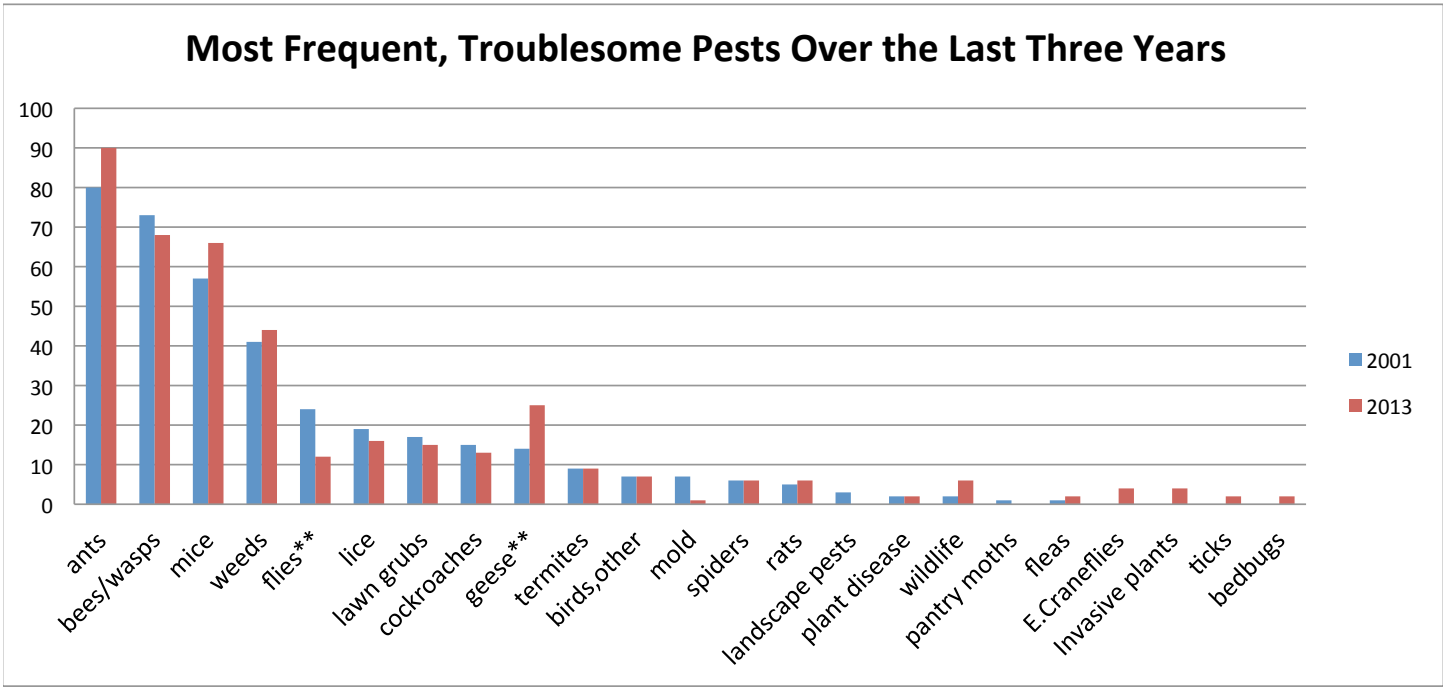
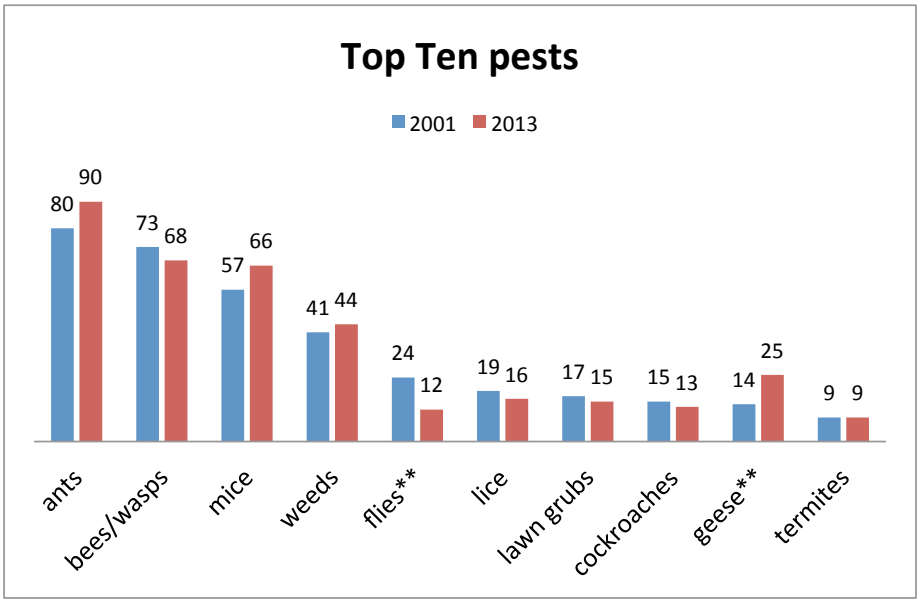


Figure 12.



19. What pest control techniques are used in the school district for indoor pests? (check all that apply).

Figure 13.

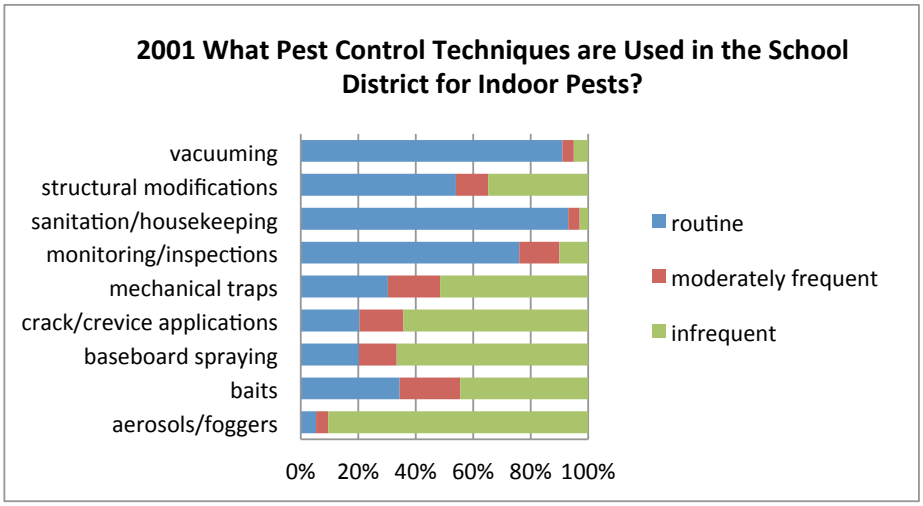
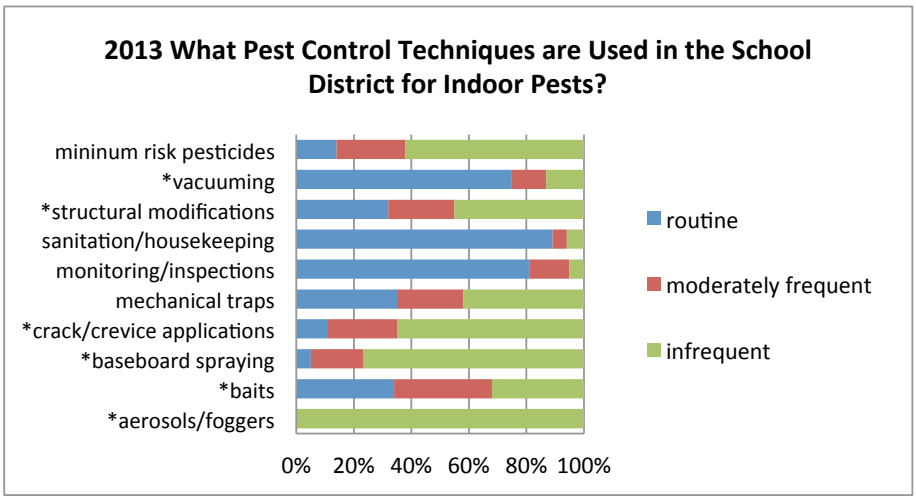


Figure 14.



20. What pest control techniques are used in the school district for outdoor pests? Check all that apply.

Figure 15.

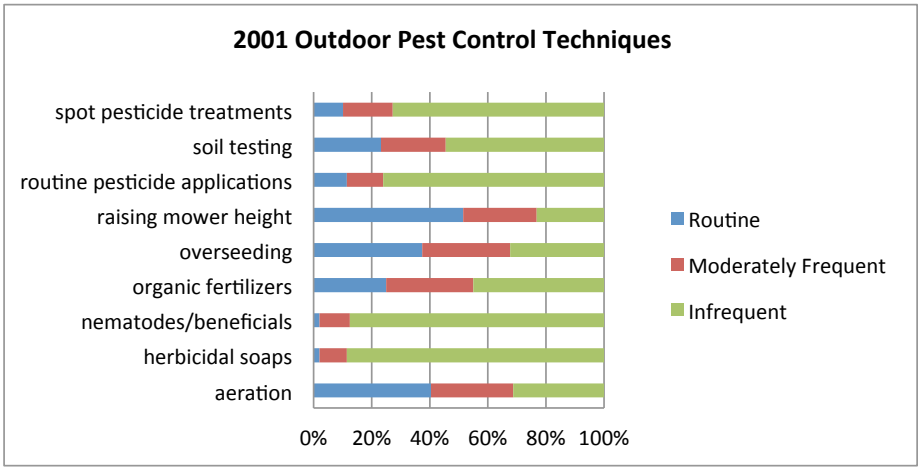
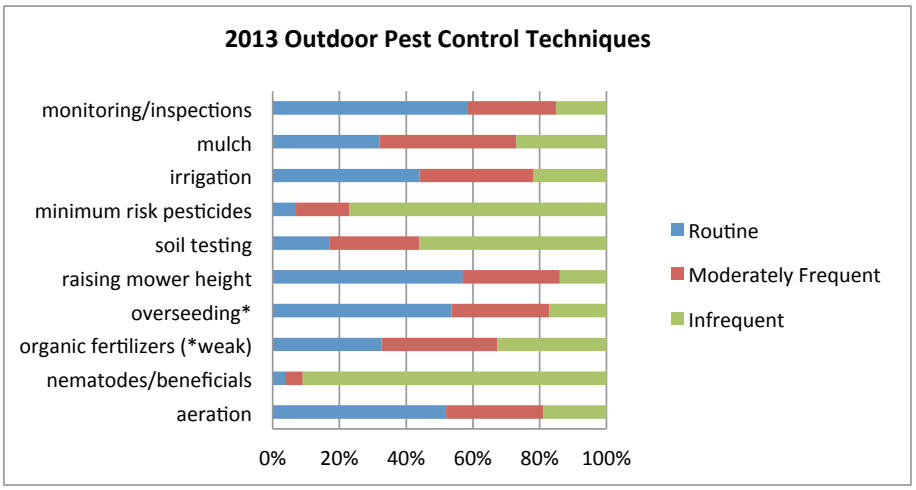


Figure 16. Asterisk indicates significantly different than 2001 survey according to the Chi Square goodness of fit test (P=0.05)



21. Have there been complaints from persons in parental relationships or staff concerning the presence of pests within the last three years?

Table 7.

	Yes	No	Unsure
2001 all	53.9%	40.4%	5.7%
2013 parents	43.8%	46.4%	9.8%
2013 staff	81.4%	16.1%	2.5%
2013 students	51.8%	37.7%	10.5%

22. Have there been complaints from persons in parental relationship or staff concerning pesticide applications within the last three years?

Table 8.

	Yes	No	Unsure
2001 all	6.3%	88.5%	5.2%
2013 parents	0.9%	94.9%	4.3%
2013 staff	0.9%	95.7%	3.4%
2013 students	0.0%	96.6%	3.4%

23. **Have there been complaints of adverse health reactions (for example, rash, breathing difficulty, eye irritation) that may have been related to pesticides applications within the past three years?**

24. **Have there been incidents of pesticide spills related to pesticide applications within the past three years?**

Table 9.

	Yes	No	Unsure
2001 unspecified	4.0%	93.7%	2.3%
2013 health effects	0.0%	96.6%	3.4%
2013 spills	0.0%	100.0%	0.0%

25. **If you answered yes to the previous question, have these incidents required the involvement of outside responders? (N=32) (2013)**

Yes: 0%, No: 96.9%, Unsure: 3.1%

26. **Does the school employ individuals of staff who are certified by the State DEC as pesticide applicators?**

Table 10.

	Yes	No	Unsure
2001	49.5%	50.5%	0.0%
2013	34.2%	65.0%	0.9%

27. **If yes, on average, approximately how many hours of annual pest management training does each certificed pesticide applicator attend?**

Table 11.

	< 10 hrs.	11 to 30	> 30 hrs.
2001	69.4%	26.3%	4.3%
2013	55.5%	37.0%	3.7%

28. **Do school staff other than certified pesticide applicators ever apply pesticides in the school or on school grounds?**

Yes: 7.8%, No: 91.3%, Unsure: 0.9%

29. How much money (in dollars) was spent district-wide during the previous school year on each of the following pest control activities?

Table 12.

	n	mean	median	max	STD
Employee training	59	$382.30	$35.00	$3,000.00	$633.10
Employee labor for performing pest control	54	$674.20	$225.00	$7,500.00	$1,214.80
Non-chemical pest control equipment and supplies	53	$1,566.70	$100.00	$40,000.00	$6,172.70
Pesticide application equipment and supplies	51	$161.70	0	$2,200.00	$387.00
Contracted services	80	$7,735.60	$1,530.00	$300,000.00	$33,867.20
Notification costs for neighbor notification law	55	$102.90	0	$1,000.00	$227.10
Implementation of chapter 85	43	$1,272.10	0	$30,000.00	$5,436.00
Facility modification for pest control enhancement	55	$620.90	0	$10,000.00	$1,662.90
Other- please specify	10	0	0	0	0

30. Has the School District had any problems implementing the Neighbor Notification Law?

Yes: 3.5%, No: 88.6%, Unsure: 7.9%

31. Since 2000 has the Neighbor Notificaiton Law resulted in a significant reduction in the use of pesticides in the SD?

Yes: 37.4%, No: 40.9%, Unsure: 31.7%

32. During the 2011-2012 school year, approximately how many parents, guardians, and staff requested 48 hour advance written notice of a pesticide application?

Table 13.

	frequency	percent	cumulative frequency	cumulative percent
0	44	34.7%	44	34.7%
0-25	33	26.0%	77	60.6%
26-50	5	3.9%	82	64.6%
51-200	10	7.9%	92	72.4%
201-500	2	1.6%	94	74.0%
501-1000	3	2.4%	97	76.4%
1001 or more	2	1.6%	99	78.0%
missing	28	22.1%	127	100.0%

33. During the 2011-2012 school year, approximately what percentage of the possible requestors (parents, guardians, and staff) requested 48 hour advance written notice of a pesticide application?

Table 14.

	frequency	percent	cumulative frequency	cumulative percent
0	55	43.3%	55.00%	43.3%
0-10	29	22.8%	84.00%	66.1%
10-50	8	6.3%	92.00%	72.4%
50-100	8	6.3%	100.00%	78.7%
missing	18	14.2%	118.00%	92.9%
uncategorized	5	3.9%	123.00%	96.9%
unknown or unsure	4	3.2%	127.00%	100.0%

34. In 2011, a New York State law (Laws of 2010, Chapter 85) that prohibits the use of most pesticides on playgrounds, turf, athletic and playing fields at school took effect. Which statement best describes how this has affected your school district?

Table 15.

	percentage
Major Change—it will be difficult to maintain quality without using pesticides	22.4%
Moderate Change—we are looking into pesticide alternatives	19.8%
Very Little Change—we were already using pesticide alternatives	57.8%

35. In regard to Chapter 85, have you requested an emergency pesticide application determination from the school board?

Yes: 17.2%, No: 79.3%, Unsure: 3.4%

36. If you answered no to the previous question, do you plan to seek a determination for this school year?

Yes: 8.4%, No: 75.8%, Unsure: 15.8%

37. Has the implementation of Chapter 85 caused a reduction in the use of pesticides in the SD?

Yes: 62.1%, No: 33.6%, Unsure: 4.3%

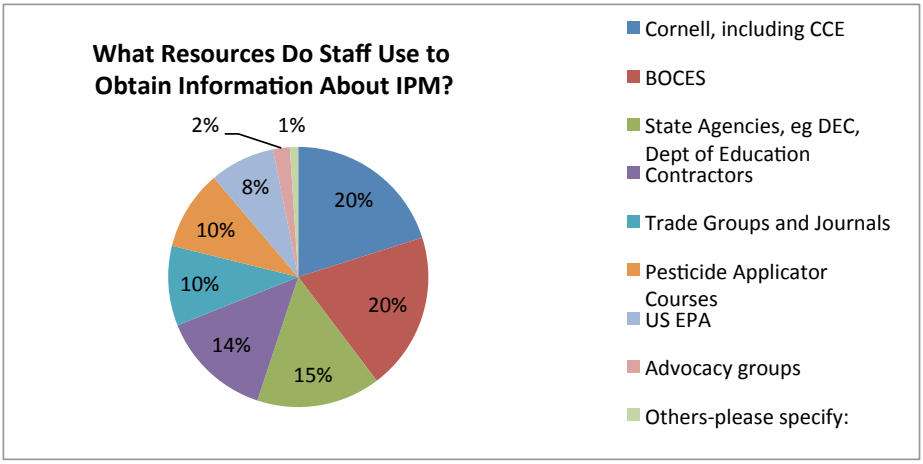
38. What problems has the SD experienced implementing IPM?

Table 16.

Problem	Percent
Food in non-cafeteria locations	70.9
Constituency apathy or resistance	35.0
Cost and/or limited funds	18.8
Heavy use of fields and/or buildings	55.6
Scheduling or other time constraints	23.1
Need for education, training, and cooperation	32.5
Other, please specify • emergency applications without going through channels • breakfast in classrooms, non-staff users of buildings • we deal with the weeds with mowing • staffing and cost of IPM is prohibitive, we have just let the weeds grow and the lawn looks bad • working well	4.3

39. What resources do staff use to obtain information about IPM? Check all that apply.

Figure 17.



DISCUSSION

A limitation on comparing the two surveys is that we had a much higher return rate in 2001 than in 2013. However the relative rates of return were similar in the two surveys among various regions of the state and among rural, suburban, and urban school districts.

Among respondents, there was a large increase in 2013 compared to 2001 in districts that reported having a written pest management policy. However, there was little change in the percentage of districts that have policies concerning food outside of cafeterias. This is one of the most problematic issues concerning structural pest management in NYS schools. Although there was an increase, most districts still do not have pest management advisory committees. The percentage of respondents reporting the use of regularly scheduled pesticide applications changed little with almost a quarter of 2013 respondents reporting such practices. Interestingly, the reported use of pest siting logs decreased in 2013 compared to 2001. If accurate, it would be worth investigating whether schools have other effective internal mechanisms for reporting pests or if this is a significant gap in district record keeping.

In both surveys, districts reported that their most frequent and troublesome pests were ants, stinging insects, mice, and weeds. One of the few changes was a large increase in the percentage of districts stating that geese are significant pests. This was not unexpected given the increase within NYS of resident Canada geese (Paul Curtis, Cornell University, personal communication).

Comparing the results of the two surveys, indoor pest management techniques that changed were largely decreases in the frequency of baseboard spraying, crack/crevice treatments, structural modifications, and vacuuming. Decreases in baseboard spraying and crack/crevice treatments suggest a decrease in pesticide use. Baseboard spraying, in particular, is generally considered a problematic practice within school buildings. Structural modification, on the other hand, is a key preventative step in preventing pest entry into buildings, while vacuuming up pests is obviously a non-pesticidal approach to removing pests. More information may be needed in order to tease out the nuances involved.

Usage rates of outdoor (grounds) techniques, aeration and overseeding increased in 2013 compared to 2001 while soil testing decreased although not significantly. Increased use of aeration and (especially) overseeding as cultural techniques are positive signs. Unless there are major environmental changes at a site, frequent soil testing is usually not as crucial for turf management (Brian Eshenaur, NYS IPM Program, personal communication).

The use of minimum risk pesticides, such as plant essential oil products, by NYS schools was generally low in 2013 with approximately 10% indicating frequent usage. The question was not asked in 2001. It will be interesting to see if the use of minimum risk pesticides by schools increases in the future.

In 2001, more than half of the school districts reported complaints about pests, while 6% received complaints about pesticides. In 2013, survey respondents indicated that complaints about pests were common especially from school staff. There were few complaints in the 2013 survey about pesticide use. Although there were a small number of reported pesticide spills or health effect concerns in the 2001 survey, almost none of the 2013 respondents reported such incidents.

There was a large decrease in the percentage of responding school districts that have certified pesticide applicators on staff. Since 2001, the fees for obtaining and maintaining certification have increased dramatically in NYS, and this is probably a factor.

Based on the 2013 survey, most school districts have adapted well to the NNL, with the majority not reporting any problems. About one half of the districts indicated that they have decreased pesticide use as a result of the NNL. Statewide, relatively few people are signing up for 48-hour pre-notification of pesticide use in schools.

Although most of the 2013 survey respondents reported little impact of Chapter 85 (Child Safe Playing Field Act) on their operations, many others have encountered or are anticipating difficulty. Most responding districts have not applied for any emergency pesticide application determination. Of those that have, the most frequent situations involve lawn grubs, weeds, and stinging insects. The majority of respondents indicated that Chapter 85 has resulted in a decreased use of pesticides at their schools. About a third indicated that it had not. However, some of these districts may have already been applying little, if any, pesticides on school grounds.

The most frequently reported obstacles to IPM implementation highlight the need for creative and effective outreach to all school constituencies, not just facilities staff. According to the 2013 survey, the biggest obstacle was food in non-cafeteria locations. Given governmental nutrition programs such as breakfast in schools and the time demands on teachers' schedules, banning food in the classroom and similar sites may be difficult. Although some districts have such bans, it might be more effective to seek to implement proper food storage and disposal and sanitation practices in classrooms.

CONCLUSIONS

Improvements from 2001 to 2013 included a large increase in the NYS public school districts that have a written pest management policy. There were also decreases in at least some types of pesticide application techniques notably baseboard spraying. Increased uses of aeration and overseeding in turf management were other positive outcomes. NYS schools received few complaints on pesticide applications and related health concerns and had very few pesticide spills. These are positive indicators of effective pest management programs at schools. NYS schools report that both the NNL and Chapter 85 have resulted in the reduction of pesticide use. In general, schools have adapted well to the NNL.

Prominent needs that still exist concerning pest management in NYS schools include the pervasive issue of food in classrooms and other non-cafeteria locations. This highlights the need for increased, effective outreach to all school stakeholders. Additionally, a persistent gap in the pest management framework at NYS schools is the lack of pest management advisory committees. Approximately 25% of the responding school districts indicated that they still have regularly scheduled pesticide applications within instructional buildings. Many schools are having significant challenges in complying with Chapter 85 and still maintaining the quality of their grounds. Pest pressures, in terms of species, have largely remained consistent. A notable exception was the increase in goose problems.

Aspects of NYS school pest management programs that may need further investigation include the drop of schools reporting the use of pest siting logs. Schools may be utilizing other effective means of reporting pests, or this may be a gap in their IPM policies. The reported decreased use of structural modifications and vacuuming as pest management techniques may also need clarification. Additionally, the impact of the decrease in school staff that are certified pesticide applicators could be elucidated. Future trends in the use of minimum risk pesticides by schools would also be informative. Finally, both the 2001 and 2013 surveys were of the public school sector in NYS. It would be informative to expand the survey to non-public schools to assess similarities and differences.

Literature Cited

Braband, L., E. Horn, and L. Sahr. 2002. Pest Management Practices; A Survey of Public School Districts in New York State. NYS IPM Program Publication Number 613, Geneva, NY. 21 pp.

Appendix A: Survey Questions

Welcome to the Public Elementary & Secondary School Integrated Pest Management Survey
This survey contains 39 questions and should take approximately 15-20 minutes to complete. You must complete the survey once you begin - you will not be able to save your answers and go back to the survey to finish at a later time.

Thank you for participating in our survey.
Your feedback is important.

***1. School District ID #**

2. How would you describe your school district?

- ◯ Urban
- ◯ Suburban
- ◯ Rural

3. What county is the school district located in? If the district occupies more than one county, please indicate the main county.

4. What is the total square footage of school buildings in your district?

5. What is the total acreage of all school grounds, including athletic fields, in your district?

6. Does the school district have a written pest management policy?

- ◯ Yes
- ◯ No
- ◯ Unsure

7. Does the school district require the use of the following and are they part of the written pest management plan? Check one answer for each item.

	Required	Part of Plan	Both Required & Part of Plan	Neither Required or Part of Plan
Regular inspections	◯	◯	◯	◯
Monitoring	◯	◯	◯	◯
Sanitation and housekeeping	◯	◯	◯	◯
Education of school constituencies	◯	◯	◯	◯
Pest exclusion	◯	◯	◯	◯
Record keeping	◯	◯	◯	◯
Other	◯	◯	◯	◯

8. Has the pest management policy been publicized and explained to the following? Check all that apply.

	Yes	No	Unsure
Persons in parental relation	◯	◯	◯
Students	◯	◯	◯
Teachers/ Instructors	◯	◯	◯
Custodial/Facilities Staff	◯	◯	◯
Office/Professional Staff	◯	◯	◯
Administrators	◯	◯	◯
After-school users	◯	◯	◯
Pest Management Contractors	◯	◯	◯

9. Do you have a school district policy concerning the storage, preparation, and consumption of food outside of cafeterias?

- [ ] Yes
- [ ] No
- [ ] Unsure
- [ ] If yes, please specify the policy

10. Does the school district have a pest management advisory committee?

- ◯ Yes
- ◯ No
- ◯ Unsure

11. Has the school district designated an individual to be the pest management contact?

- ◯ Yes
- ◯ No
- ◯ Unsure

12. Are building occupants trained and encouraged to participate in the school's pest management program?

	Yes	No	Unsure
Students	◯	◯	◯
Teachers/Instructors	◯	◯	◯
Custodial/Facilities Staff	◯	◯	◯
Office/Professional Staff	◯	◯	◯
Administrators	◯	◯	◯
After-school users	◯	◯	◯

13. Does the school district perform regularly scheduled pesticide applications in instructional school buildings?

- [ ] Yes
- [ ] No
- [ ] Unsure
- [ ] If yes, how often do scheduled applications take place?

14. Does the school district perform regularly scheduled pesticide applications in non-instructional school buildings?

- [ ] Yes
- [ ] No
- [ ] Unsure
- [ ] If yes, how often do scheduled applications take place?

15. When do indoor pesticide applications generally take place? Check all that apply.

- [ ] After school hours
- [ ] Before school hours
- [ ] Anytime during the day
- [ ] Weekends/Holidays
- [ ] Never
- [ ] Unsure

16. Who decides when and which pesticides are applied to school buildings or grounds (not including applications made to playgrounds, turf, athletic or playing fields that would require an emergency determination under Chapter 85 of the laws of 2010)? Check all that apply.

- [ ] Board of Education
- [ ] School District Superintendent
- [ ] Building Principal
- [ ] Superintendent of Buildings & Grounds
- [ ] Custodian/Grounds Staff
- [ ] Private Pest Management Company
- [ ] Other, please specify

17. Does the school maintain pest sighting records?

- ◯ Yes
- ◯ No
- ◯ Unsure

18. What have been the most frequent and/or troublesome pest(s) in the school district within the past three years? Check all that apply.

- [ ] Ants
- [ ] Termites
- [ ] Ticks
- [ ] Bedbugs
- [ ] Pantry moths
- [ ] Bees/wasps
- [ ] Cockroaches
- [ ] Fleas
- [ ] Flies
- [ ] European Crane Flies
- [ ] Spiders
- [ ] Lice
- [ ] Birds (except geese)
- [ ] Geese
- [ ] Wildlife (other than birds)
- [ ] Mice
- [ ] Rats
- [ ] Mold/mildew/fungi
- [ ] Lawn grubs
- [ ] Tree/plant disease
- [ ] Weeds, common (e.g. dandelion, clover, plantain)
- [ ] Invasive plants (e.g. Oriental bittersweet, giant hogweed)
- [ ] Other, please specify

19. What pest control techniques or products are used in the school district for indoor pests? Check all that apply.

Routinely = Monthly or more frequently based on a prearranged schedule
Moderately = Quarterly or bi-monthly
Infrequently = Less than quarterly and not based on a prearranged schedule

	Routinely	Moderately	Infrequently
Total Release Foggers	◯	◯	◯
Baseboard Spraying	◯	◯	◯
Crack/Crevice Applications	◯	◯	◯
Baits	◯	◯	◯
EPA minimum risk pesticides	◯	◯	◯
Mechanical Traps	◯	◯	◯
Vacuuming	◯	◯	◯
Monitor/Inspect	◯	◯	◯
Sanitation/Housekeeping	◯	◯	◯
Structural Modifications	◯	◯	◯

20. What pest control techniques or products have been put into effect in the school district for outdoor pests after the implementation of Chapter 85 (recently enacted law to prohibit use of most pesticides on playgrounds, turf, athletic and playing fields at schools)? Check all that apply.

Routinely = Monthly or more frequently based on a prearranged schedule
Moderately = Quarterly or bi-monthly
Infrequently = Less than quarterly and not based on a prearranged schedule

	Routinely	Moderately	Infrequently
Raising mower height	◯	◯	◯
Watering	◯	◯	◯
Aeration	◯	◯	◯
Overseeding	◯	◯	◯
Mulching	◯	◯	◯
Beneficial Insect-killing Nematodes	◯	◯	◯
Fertilization	◯	◯	◯
EPA minimum risk pesticides	◯	◯	◯
Monitoring/Inspection	◯	◯	◯
Soil testing	◯	◯	◯

21. Have there been complaints concerning the presence of pests (such as wasps, weeds and grubs) within the past three years?

	Yes	No	Unsure
Persons in Parental Relation	◯	◯	◯
Staff/Building Occupants	◯	◯	◯
Students	◯	◯	◯

22. Have there been complaints concerning pesticide applications within the past three years?

	Yes	No	Unsure
Persons in Parental Relation	◯	◯	◯
Staff/Building Occupants	◯	◯	◯
Students	◯	◯	◯

23. Have there been complaints of adverse health reactions (for example rash, breathing difficulty, eye irritation) that may have been related to pesticide applications within the past three years?

- ◯ Yes
- ◯ No
- ◯ Unsure

24. Have there been incidents of pesticide spills related to pesticide applications within the past three years?

- ◯ Yes
- ◯ No
- ◯ Unsure

25. If you answered yes to the previous question, have these incidents required the involvement of outside responders or resources?

- ◯ Yes
- ◯ No
- ◯ Unsure

26. Does the school employ individuals on staff who are certified by the State Department of Environmental Conservation as pesticide applicators?

- ◯ Yes
- ◯ No
- ◯ Unsure

27. If yes, on average, approximately how many hours of annual pest-management training does each certified pesticide applicator attend?

28. Do school staff other than certified pesticide applicators ever apply pesticides in the school or on school grounds?

- ◯ Yes
- ◯ No
- ◯ Unsure

29. How much money (in dollars) was spent district wide during the previous school year on each of the following pest control activities?

Employee training	
Employee labor for performing pest control	
Non-chemical pest control equipment/supplies	
Pesticide application equipment/supplies	
Contracted services	
Notification costs for Neighbor Notification Law	
Implementation of Chapter 85	
Facility modification for pest control enhancement	
Other (please specify)	

Neighbor Notification Law

30. Has the school district had any problems implementing the Neighbor Notification Law?

- [ ] Yes
- [ ] No
- [ ] Unsure
- [ ] If yes, please specify

31. Since 2000, has the Neighbor Notification Law resulted in a significant reduction in the use of pesticides in the school district?

- ◯ Yes
- ◯ No
- ◯ Unsure

32. During the 2011-2012 school year, approximately how many (eg. 10 or 20) parents, guardians, and staff requested 48-hour advance written notice of a pesticide application?

33. During the 2011-2012 school year, approximately what percentage of the possible requestors (parents, guardians, and staff) requested 48-hour advance written notice of a pesticide application?

New York State Laws of 2010, Chapter 85

34. In 2011, a New York State law (Laws of 2010, Chapter 85) that prohibits the use of most pesticides on playgrounds, turf, athletic and playing fields at schools took effect. Which statement best describes how this has affected your school district?

- ◯ Very little change, we were already using pesticide alternatives
- ◯ Moderate change, we are looking into pesticide alternatives
- ◯ Major change, it will be difficult to maintain quality without using pesticides

35. In regard to Chapter 85, have you requested an emergency pesticide application determination from the School Board?

- ☐ Yes
- ☐ No
- ☐ Unsure
- ☐ If yes, what pest did the emergency pesticide application pertain to and was it granted?

36. If you answered no to the previous question, do you plan to seek a determination for this school year?

- ◯ Yes
- ◯ No
- ◯ Unsure

37. Has the implementation of Chapter 85 caused a reduction in the use of pesticides in the school district?

- ◯ Yes
- ◯ No
- ◯ Unsure

38. What problems has the school district experienced implementing IPM? Check all that apply.

- [ ] Food in non-cafeteria locations
- [ ] Constituency apathy or resistance
- [ ] Cost and/or limited funds
- [ ] Heavy use of fields and/or buildings
- [ ] Scheduling or other time constraints
- [ ] Need for education, training, and cooperation
- [ ] Other, please specify

39. What resources do staff use to obtain information about IPM? Check all that apply.

- [ ] Cornell University (including Cornell Cooperative Extension)
- [ ] Contractors
- [ ] BOCES
- [ ] Trade groups and journals
- [ ] State agencies, such as Department of Environmental Conservation and Department of Education
- [ ] US Environmental Protection Agency
- [ ] Pesticide applicator courses
- [ ] Advocacy groups
- [ ] Other, please specify

40. Please share any additional comments

Appendix B: Survey Cover Letter

Cornell University
New York State
Integrated Pest Management Program

Lynn Braband
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Date: January 2013
To: School facilities manager
From: Lynn Braband, NYS IPM Program of Cornell University
Subject: Integrated Pest Management (IPM) Survey

I am writing to invite your participation in documenting and improving pest management practices in NYS Schools by filling out a simple survey. In 2001, the New York State Integrated Pest Management Program of Cornell University, the State Department of Health, and the State Education Department collaborated in a survey of the pest management policies and practices of NYS public schools. With an approximately 80% response rate, the results provided both a needed baseline of information and valuable input for designing outreach to meet identified needs. The report on the 2001 survey may be accessed at http://www.nysipm.cornell.edu/publications/pubbldg.asp .

In the subsequent years, major changes have occurred including the emergence of new pests, new laws impacting pest management at schools, and numerous outreach activities. Together with the NYS Association for Superintendents of School Buildings and Grounds, we are again partnering to repeat and build upon the 2001 survey. For your perusal, a pdf of the survey questions is attached. However, the survey needs to be completed on-line at https://www.surveymonkey.com/s/NJ9YJXB . You may start the survey and return to it later. It is not necessary to complete it in one sitting. The first question asks for your assigned "school district ID #". Please refer to the attached list for this number. The survey is voluntary and confidential. The ID # will assist us in tracking surveys that have been completed and avoiding duplication of survey submissions. This ID # list will be destroyed after the project is finished.

Any questions concerning survey content should be directed to Lynn Braband (contact information above). Technical concerns about the survey instrument should be addressed to Karen Wilson (518-402-7950; kxf07@health.state.ny.us).

We appreciate your participation to document the leadership role that NYS schools continue to take concerning safe and effective pest management and to provide input for the future.

Sincerely,

Lynn Braband

IPM Integrated Pest Management