

*Reducing Pesticides in Minnesota Schools
Pilot Project*

Final Report

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Results of a School Integrated Pest Management Pilot Project

Reducing Pesticides in Minnesota Schools was a two-year pilot project initiated by the nonprofit *Saint Paul Neighborhood Energy Consortium* (NEC) in partnership with *Advocates for Better Health and Environment* and four Minnesota schools. The purpose of this project was to determine whether an effective Integrated Pest Management (IPM) program is feasible in Minnesota schools. This project was funded in part by the *Minnesota Office of Environmental Assistance*. The four schools who participated in this two-year pilot project were:

- **Randolph Heights Elementary School**, St. Paul
- **Como Park Senior High School**, St. Paul
- **Lincoln Elementary School**, Faribault
- **Sibley Elementary School**, Northfield

What is Integrated Pest Management (IPM)?

IPM is a term used to describe the practice of determining and implementing the most appropriate and least hazardous techniques for controlling pests. IPM focuses on prevention and uses methods that cause the least possible harm to people and the environment. While IPM is site and use-specific, some common examples of IPM techniques include: monitoring of pest problems; physical controls like mousetraps and building repairs; and biological controls. Least toxic chemical controls may be used, but only when absolutely necessary.

Why IPM in schools?

Many parents are concerned about pesticide use in their children's schools. Several parent advocates, environmental groups and state legislators formed a Minnesota coalition to pass the *Janet B. Johnson Parent's Right to Know Act of 2000*. Now Minnesota law requires that parents be notified when pesticides are used in schools. The best way to reduce or eliminate pesticide use in schools is to implement IPM.

Routine pesticide use is common in schools across the country. A 1997 survey conducted in Illinois public schools found that 82% of schools regularly spray pesticides. A 1998 survey in Wisconsin found that 90% of public schools and 56% of private schools used pesticides. A 2000 survey of Minnesota schools, conducted by the Department of Agriculture found that 100% of the 20 schools surveyed routinely used pesticides. A 1999 survey by the same agency found that only 20% of schools surveyed had IPM plans in place for outdoor pest control and only 25% had IPM plans in place for indoor pest control.

While the long-term health effects on children from the application of pesticides are not fully understood, the incorrect or unnecessary use of pesticides, even when applied after school hours can place children and staff at risk. With some education and training, schools can significantly reduce and sometimes avoid reliance on pesticides while effectively controlling pests. IPM is a sound, effective and proven method of pest management, utilized by a growing number of schools nationwide.

Pilot Project Activities

Through this project **we surveyed pesticide use and practices** in four Minnesota schools, both before (baseline) and after (study year) IPM implementation. An IPM work team at each school identified and implemented the least toxic methods to manage pests in school buildings and on school grounds. **The IPM teams received training on IPM from national experts. Each school developed an IPM plan**, which included both building practices and a guide for turf maintenance. In the second year each school implemented its plan, beginning with **an inspection of the building and grounds** to identify issues that needed to be worked on. For example, we noted holes needing to be screened or caulked, so pests couldn't enter the building. During the grounds inspection, experts from the University of Minnesota Extension Service helped each school identify grounds and turf issues.

In order to educate the entire school community about IPM, we offered teacher and parent education sessions. We also sent home two newsletters informing parents about the project. We posted posters through the school building asking everyone to be conscious about food in the schools. For example, we asked students to help prevent pest problems by not leaving food in lockers or desks overnight.

Each school developed activities to get the students involved. For example, Sibley Elementary undertook a school-wide environmental enrichment program, with each student selecting an education module to pursue. Modules included indoor air quality, healthy cleaning, composting, butterfly gardens, chemical-free lawn care, prairie restoration, garbage and recycling, and many others. The students displayed their work at a Spring Environmental Fair, which was attended by parents and friends. At Como Park Senior High, project staff worked with the environmental science teacher to educate the students about pests and IPM. The teacher then worked with student volunteers to tackle mice and ant problems right in the classroom. Students received extra credit for doing a room inspection and cleanup, based on what they had learned about IPM.

We also offered **community-wide educational seminars on environmental health topics and presentations to Early Childhood Family Education (ECFE) classes.** The project sponsored seven community education presentations, attended by IPM team members and hundreds of community residents in Faribault, Northfield, Minneapolis and St. Paul. These presentations, especially the session by Dr. Phillip Landrigan at the Westminster Town Forum on children's environmental health received broad media coverage. In addition, 140 families in Faribault, St. Paul and Minneapolis attended ECFE presentations, with 96% of attendees rating the presentations valuable to very valuable. Eighty-one percent of parents they would make at least one change at home based on what they learned in the session.

Results of the Pilot Project

- **Extent of pest problems.** Participant schools did not have big pest problems, as evidenced by survey results and the initial inspections. Ants, bees/wasps/yellow jackets and weeds are chronic issues, as are mice in the St. Paul schools. These pests

were also identified as the most common problem pests in the Department of Agriculture survey of 20 Minnesota schools.

- **Use of pesticides.** The four schools participating in this study were already cautious in their use of pesticides. The St. Paul schools had not used any pesticides for two years and resumed limited pesticide use in the project study year; they also resumed limited use of lawn chemicals. Rodent treatments were applied at Como. Lincoln used no pesticides either prior to or during the project. Sibley had limited use of pesticides in the building, but used none on the grounds in the study year.
- **Use of IPM techniques.** These schools were already partially practicing IPM in their approaches to pesticide use and in good sanitary practices, as evidenced by survey results and facility inspections. However, after IPM implementation, they appeared to be more conscious of sanitation, preventive maintenance practices and preventive food policies.
- **Awareness of pest management practices.** The follow-up survey showed that team members were much more knowledgeable about IPM than they were at baseline. The project clearly succeeded in heightening awareness and concern about pesticide use and the importance of IPM in these schools.
- **Parent notification.** None of the parents in our study were put on the list for parent notification. We cannot say whether this lack of interest among parents is due to the fact that they were not concerned about pesticide use, did not pay attention to the issue or felt satisfied that their school had implemented IPM. However, we know from the experience of other schools that parent notification, although important, is insufficient to assure protection from pesticide exposure. Schools need to take the next step and implement IPM.
- **Costs.** Overall, the project found that IPM did not increase costs for the school district. Costs for grounds maintenance decreased for Lincoln and Sibley, because they no longer contracted for chemical lawn treatment. These costs increased for the St. Paul schools, which had not contracted for lawn treatments in the baseline year, but did so in the study year. Costs remained the same for all schools for the building, as three of the schools contracted with pest control companies for the same monthly rate per visit. Lincoln used a PCO for the building in neither the baseline nor the follow-up year, so building costs remained the same.
- **Challenges.** Sustaining interest and involvement of team members continued to be a challenge throughout the project. Without an IPM coordinator right at the school, keeping the focus on IPM might be harder to sustain over time. Also, parental involvement was minimal. Ongoing accountability to parents is a key success factor for IPM. This project was not successful in engaging parents in this issue, even with efforts including PTO presentations and newsletters.
- **There is good potential for adopting IPM district-wide in these three school districts.**

These schools showed that it was feasible to implement IPM without incurring additional costs. This project proved that any school can have a successful IPM program, with a little bit of technical assistance and the commitment to make changes.

What schools need to implement IPM:

- Commitment to IPM by principal, district facilities and grounds staff, custodian and pest control contractor (if applicable).
- IPM coordinator or person responsible for IPM coordination.
- IPM team at school.
- Support and participation of parents e.g. through the PTA or PTO.
- Training on IPM
- Tools to implement IPM, e.g. model IPM plan, turf maintenance plan, information on pests, student curricula, posters, inspections checklist, head lice fact sheets, etc.

School IPM Resources:

1. Reducing Pesticides in Minnesota Schools Pilot Project- St. Paul Neighborhood Energy Consortium (NEC)

- Available from *Minnesota Office of Environmental Assistance*, www.moea.state.mn.us: Model IPM Plan, Turf Maintenance Sheet, Head Lice Information Sheet in English or Spanish, baseline survey report

- Available through *St. Paul NEC*, 651-222-7678: Poster, “Stop These Pests”

If you have any questions about the project, you may contact one of the project co-coordinators, Kathleen Schuler (651-222-7678) or Judy Chavie (507-334-5179).

2. Healthy Schools

- Healthy Schools Network, Inc <http://www.healthyschools.org/>
- Minnesota Department of Health, Healthy Children Healthy Schools Newsletter, <http://www.health.state.mn.us/divs/fh/mch/CAREweb/newsw01.html#intro>
- US Environmental Protection Agency, Tools for Schools Program, <http://www.epa.gov/iaq/schools/index.html>

3. Training and Information- Minnesota Department of Agriculture:

- IPM training sessions for schools throughout Minnesota in spring 2002.
- IPM and Pest information sheets, including IPM overview, ants, bees/wasps, rodents, small flies, cockroaches, weeds and head lice.
- *Pest Patrol*, student activity booklet and teacher guide (3rd grade level, meets graduation standards) www.mda.state.mn.us/ipm/IPMinSchools.html, Contact Jeanne Ciborowski: 651-297-3217

4. General resources:

- California Environmental Protection Agency, Department of Pesticide Regulation, School IPM Program, <http://www.cdpr.ca.gov/docs/schoolipm/>
- IPM Institute of North America, School IPM, <http://www.ipminstitute.org/school.htm>
- Purdue University, IPM Technical Resource Center, School IPM Hot Line 1-877-668-8476 <http://www.entm.purdue.edu/entomology/outreach/schoolipm/ipmfront.htm>
- University of Florida, IPM in Schools, <http://schoolipm.ifas.ufl.edu/>

5. Other Minnesota resources and contacts:

- University of Minnesota Extension Service, Community and School IPM, <http://www.extension.umn.edu/pesticides/IPM/ipmhome.htm> , Dean Herzfeld, 612-624-3477
- Minnesota Department of Children Families and Learning, Searchable Database for Toxicity Categories and Pesticide Products, <http://cfls.state.mn.us/pesticide>
- Minnesota Department of Health, Model Pesticide Notices and Memorandum to Schools, <http://www.health.state.mn.us/divs/eh/esa/hra/notification.html>, Chuck Stroebel, 651- 215-0919

Part 1: Background & IPM Implementation

Reducing Pesticides in Minnesota Schools was a two-year pilot project initiated by the nonprofit Saint Paul Neighborhood Energy Consortium (NEC) in partnership with Advocates for Better Health and Environment and four Minnesota schools. The purpose of this project was to determine whether an effective Integrated Pest Management (IPM) program is feasible in Minnesota schools.

A. Background

• Why IPM in schools?

Routine pesticide use is common in schools across the country. A 1997 survey conducted in Illinois public schools found that 82% of schools regularly spray pesticides. A 1998 survey in Wisconsin found that 90% of public schools and 56% of private schools used pesticides. A survey of Minnesota schools, conducted by the Department of Agriculture found that only 20% of schools surveyed had IPM plans in place for outdoor pest control and 25% had IPM plans in place for indoor pest control.

While the long-term health effects on children from the application of pesticides are not fully understood, the incorrect or unnecessary use of pesticides, even when applied after schools hours, can place children and staff at risk. With some education and training, schools can significantly reduce (and sometimes avoid entirely) reliance on pesticides while effectively controlling pests. A sound, effective and proven method of pest management called Integrated Pest Management (IPM) is now being utilized by a growing number of schools nation wide.

• What is IPM?

IPM is a term used to describe the practice of determining and implementing the most appropriate and least hazardous techniques for controlling pests. IPM focuses on prevention and uses methods that cause the least possible harm to people and the environment. While IPM is site- and use-specific, some common examples of IPM techniques include: monitoring to accurately determine the extent and location of pest problems; physical controls like mousetraps, hand weeding and building repairs (e.g. fixing torn screens, caulking cracks and crevices to deter pests from entering building); and biological controls, such as using ladybugs to control aphids in a garden or fish to eat mosquito larvae in ponds. Chemical controls may be used, but only when absolutely necessary.

Minnesota's *Janet B. Johnson Parent's Right to Know Act of 2000*, subd. 8 defines IPM as follows:

A school board may only notify students, parents, or employers that it has adopted an integrated pest management plan, if the plan is a managed pest control program designed to minimize the risk to human health and the environment and to reduce the use of chemical pesticides, and which ranks the district's response to pests in the following manner:

- (1) identifying pests which need to be controlled;*
- (2) establishing tolerable limits of each identified pest;*
- (3) designing future buildings and landscapes to prevent identified pests;*
- (4) excluding identified pests from sites and buildings using maintenance practices;*

- (5) *adapting cleaning activities and best management practices to minimize the number of pests;*
- (6) *using mechanical methods of controlling identified pests; and*
- (7) *controlling identified pests using the least toxic pesticides with the least exposure to persons as is practicable.*

• **Four Minnesota Schools Participating in this Project**

Through this project we surveyed pesticide use and practices in four Minnesota schools. Based on the findings of this survey, work teams in the participating schools identified and implemented the least toxic methods to manage pests in school buildings and on school grounds. The four schools who participated in this two-year pilot project were **Randolph Heights Elementary School** and **Como Park Senior High School** in Saint Paul, **Lincoln Elementary School** in Faribault and **Sibley Elementary School** in Northfield. Work teams in each school, with the assistance of local and national technical experts, investigated current pesticide use and practices, and developed, tested and evaluated practical, effective, economical and safe pest management strategies.

• **Project Coordination and Funding**

The Saint Paul Neighborhood Energy Consortium (NEC) is leading this initiative in partnership with Advocates for Better Health and Environment and the administration and staff of the four participating schools. The NEC, with partial funding provided by the Minnesota Office of Environmental Assistance, provided technical assistance, gathered resource materials, facilitated meetings, arranged professional training sessions and wrote reports on the project. The NEC is a nonprofit organization that offers programs and services in the areas of recycling and waste reduction, energy conservation, water quality protection, greening, alternative transportation and toxins reduction.

• **State Regulation of Pesticide Use in Schools**

Over thirty states have taken some action to address pesticide use in, around or near their schools. Recently Minnesota joined the ranks of states regulating pesticide use in schools. The 2000 Minnesota Legislature passed the *Janet B. Johnson Parent's Right to Know Act*, cited above, requiring that parents be notified of pesticide use in both public and private schools. In Minnesota pesticide drift is also regulated, but it is not specific to schools. Some of the actions taken by other states are: restricted spray (buffer) zones to address chemicals drifting into school yards and school buildings; posting signs for indoor and outdoor pesticide applications; prior written notification for pesticide use; prohibiting when and where pesticides can be applied; and requirements for a strong integrated pest management program that limits the use of certain toxic materials.

• **How Will the Results of this Pilot Project be Used?**

A summary of this report will be available for dissemination to school superintendents in the state. Project staff will also present the results of the project to school boards and interested groups. We will also make project materials, such as the model IPM plan, head lice sheet and poster available to schools through the Department of Agriculture's IPM in Schools Training Program or upon request to the NEC. In addition, Hennepin County Extension will be printing and making the Turf Maintenance sheet available through extension service.

B. IPM Implementation

• School IPM Teams

Four schools volunteered to participate in the project and an IPM team at each school was formed. Members from the school community included: principal, teacher/s, parent, head custodian, district facilities and grounds staff, school nurse and/or other health personnel, and in some cases food service staff, ECFE and after school program coordinators.

Project co-coordinators worked with the school teams to develop and monitor the IPM plan. Judy Chavie worked primarily with Lincoln Elementary in Faribault and Sibley Elementary in Northfield, while Kathleen Schuler worked with Como Park Senior High and Randolph Heights Elementary in St. Paul. Kathleen was also responsible for overall project management. The IPM teams met periodically over the two-year pilot period. The first year, beginning Spring 1999 was devoted to planning and training, while the second year beginning Fall 2000 was the IPM implementation year.

• Development of IPM plans

Project staff developed a model IPM plan, which was individualized for each school. We used a template developed by the *IPM Institute of North America*. The plan includes, among other things:

- Ongoing monitoring
- Ongoing inspection by PCO and custodial staff
- Specified role for the PCO in carrying out the IPM plan
- Policies on pest reporting and identification
- Preventive food practices
- Sanitation and maintenance practices
- Policy on use of pesticides only as a last resort
- Policy on use of the least toxic pesticides
- Whether or not the custodian is authorized to use pesticides
- List of non-chemical controls to be implemented
- Turf maintenance plan
- Policies on notification of staff, students and parents when pesticides are used
- Non-toxic head lice treatment alternatives

The IPM plans for all four schools are similar, except that the elementary schools emphasize head lice, while Como does not. The IPM plan was sent to all team members for review and we held dinner meetings in September 2000 to discuss each school's plan. After each school IPM team approved the IPM plan, copies were placed in the head custodian's office, the main office and each district facilities and/or grounds staff person received a copy. Our Fall 2000 newsletter informed parents that they could view the IPM plan in the main office, if interested.

• Building and Grounds Inspections

In order to fully identify potential problems, we conducted a walk-through inspection of the grounds and buildings for all four schools in Summer and early Fall 2000.

Participants included: custodian, district facilities and grounds staff, project staff, county extension representatives, PCO staff and PCO IPM consultant. For the St. Paul schools,

the indoor issues and grounds and turf issues were addressed at separate walk-throughs. The inspection check-list which we used was adapted from a model developed by the Department of Agriculture and is attached as *Appendix 1*.

- **IPM Implementation**

Each of the four schools implemented IPM in the summer-early fall of 2000. The kick-off was the buildings and grounds inspection, which identified maintenance and sanitation actions which needed to be addressed. Bobby Corrigan was available as a consultant. As far as we know, the schools did not need to contact him. However, he did provide technical assistance at the March 2001 follow-up meetings and training. The IPM teams continued to meet through Spring 2001.

- **Head lice education**

Because all three elementary schools identified head lice as the biggest pest problem in the schools, we included head lice in our IPM plans, even though this is not traditionally an IPM issue. We learned from the three elementary school nurses that they were already recommending non-toxic treatment, as the pesticides are no longer effective, due to lice resistance. Generally, nurses were recommending mayonnaise, *Dippity-Do* and other non-pesticidal treatments, with careful combing and monitoring.

Project staff researched non-toxic head lice treatments and compiled an information sheet for parents, with the help of the nurses at each school. This information sheet was based substantially on work by Julie Evans of St. Cloud Minnesota. We had thought about tracking head lice incidence to see if a more intensive educational effort has any effects. However, this was not feasible, due to the low incidence of head lice cases in our schools.

We worked with the nurse at Lincoln to have the head lice information sheet translated into Spanish. We also provided a modest fund for low-income parents at Sibley. The fund was available for families of children with chronic head lice problems, without the extra resources needed to tackle the problem. Examples of things the fund would be used for are costs of laundromat, lice combs or non-toxic head lice treatments. Finally we put a request out on NEC's "Free Market" to solicit donations of vacuum cleaners for parents at Lincoln in similar situations.

- **Surveys**

We administered a **baseline survey** in early 2000 to ascertain team members' knowledge of pest management practices and pesticide use in their schools and to establish a baseline for current pest management practices and use of pesticides at each school. Members of each school's IPM team were asked to complete an eleven-page, 33-question survey. In addition, a six-page, 10-question survey tool was administered to the contracted Pest Control Organizations (PCOs). Survey subjects were asked to answer questions based on practices for the 1998-1999 school year, September 1998 through June 1999, which was identified as the "baseline study year".

Results showed that most school team members were uninformed about pest management practices and when and if pesticides are applied in and around school buildings or on the

grounds. Decisions concerning pest management, whether or not to use pesticides and which pesticides to use, when and where were made by district staff, custodians and the contracted PCO. None of the schools had an overall pest management plan. Although notification, when pesticides were used was reportedly provided in one school, the other three schools provided no notification of indoor use. Signs were generally posted when pesticides were used on grounds.

Three schools used contracted PCOs to monitor and manage pest problems indoors, while one school did not use PCO services for indoor pest control in the baseline year. Custodians were also authorized for limited use of pesticides. Participating schools use pesticides as needed for indoor pest control. In two schools the contracted PCO sprayed 1-2 times per year for weed control, while the St. Paul schools had not been sprayed for two years. Minor pest problems were identified, including, mice, ants, bees, wasps, flies, dandelions and broadleaf weeds. Head lice were also noted as a big problem in the three elementary schools. No health complaints were reportedly associated with pesticide exposure, but only two schools reported monitoring this. Most respondents thought that the current pest management program is effective and that non-chemical pest control would also be effective.

A complete report on baseline survey results is available. See resources at the end of this report. A follow-up survey was administered in Spring 2001 and results were compared with baseline. Part 2 describes the results of that survey.

Part 2: Results of Follow-up Survey of Pest Management Practices

A. Purpose

The purpose of this study was:

- To determine the level of knowledge among members of each school team of pest management and pesticide use practices in participating schools, after IPM implementation.
- To determine if there are differences in knowledge levels among the IPM team members after implementation of IPM compared with results at baseline.
- To ascertain attitudes about IPM among IPM team members.

B. Study Design and Analysis Work

• Study Design & Survey Tool Development

Kathleen Schuler, Project Coordinator developed the study design and survey tool and oversaw the study administration and analysis of results. Joan Sykora, Ph.D of Quality Management Consulting, reviewed the survey tool (*Appendix 2*). Dr. Sykora's recommended revisions were incorporated into the final survey instrument. Kathleen Schuler and Joanne Peters of *St. Paul Neighborhood Energy Consortium* (NEC) compiled the study results. Kathleen Schuler wrote this report, which was also reviewed by Judy

Chavie, Project Co-coordinator, Susan Hubbard, NEC and some members of the school IPM teams.

As noted, we administered a baseline survey in early 2000 to ascertain team members' knowledge of IPM and pest management practices in their schools. The survey instrument utilized for the follow-up survey was more abbreviated than the instrument used at baseline. Survey participants told us that the baseline survey tool was too long and asked technical questions that the majority of team members were unable to answer. Thus, we decided to make the survey tool shorter and more relevant to the interests of team members. This means that direct comparisons between baseline and follow-up on some points were not possible. Wherever possible, this report compares baseline and follow-up results.

- **Survey administration**

For Lincoln and Sibley, Judy Chavie administered the survey at IPM Team meetings. Team members were asked to complete the survey and return to Judy at the meeting. Team members absent from the meeting received a copy in their mailboxes and were requested to complete and return to Judy within a week. The Randolph Heights and Como IPM teams were unable to meet, so the surveys were placed in team member's mailboxes with a cover letter, requesting that they be returned by a certain date.

- **Key Informant Interviews**

In addition to the formal written survey, project co-coordinators interviewed district facilities and grounds staff and the **Pest Control Organization (PCO)** service representative for the two of the three schools, which use Ecolab for pest control in the buildings. We attempted to contact the PCO representative for Randolph Heights, but were unable to make contact. Since the PCO representatives were not asked to complete a follow-up questionnaire, the interviews attempted to ascertain their opinions on differences in practices after IPM implementation. Questions for these interviews may be found in *Appendix 3* to this report.

- **Review of Pesticide Application Logs**

The three schools, which contract with Ecolab Pest Elimination (all but Lincoln), retain logs of PCO service calls. The PCO service representative records the date of each visit, pests sighted and any treatments applied. Copies of these logs for the study year (academic year 2000-2001) for Randolph Heights, Como and Sibley were reviewed to verify application of pesticides in and around the school. Applications to lawns and gardens are not recorded in the logs. District facilities and grounds staff were the source of information on actual pesticide applications on the grounds.

C. Survey Participants

Members of each school's IPM team were asked to complete a four-page, 14-question survey (*Appendix 2*). Team members included:

- Principal
- Teacher/s
- Parent/s

- School nurse and health personnel
- Food service supervisor
- Discovery Club representative (Randolph only)
- For St. Paul School District- Facility Operations Coordinator and Grounds and Labor Supervisor
- For Faribault and Northfield- Facilities and Ground Directors
- Head custodian

A follow-up questionnaire was not administered to the contracted Pest Control Organizations (PCOs), as it was at baseline. However, as noted, Kathleen Schuler interviewed the PCO service representatives for two of the schools.

D. Study Year

Survey subjects were asked to answer questions based on practices for the 2000-2001 school year, September 2000 through June 2001, which shall be termed the “study year”. The baseline study year was 1998-1999.

E. Response Rates

A total of 30 surveys were sent out. Twenty-two (N=22) surveys were returned, giving a response rate of 73%. Table 1 summarizes response rates for each school and in total. The best response rate for team members was from principals, teachers and custodians, 100% of whom returned their surveys. Of the four schools, Lincoln Elementary had the best response rate with a 100% of surveys returned.

Table 1: Survey Response Rates- Number returned/Number administered

	<i>Principal & teachers</i>	<i>Cus-todian</i>	<i>Parent</i>	<i>Nurse & health staff</i>	<i>District facilities & grounds staff</i>	<i>Food Svc. & Other</i>	<i>Total</i>
Como	2/2	1/1	0/0	0/1	1/2	0/0	4/6
Randolph	3/3	1/1	0/0	0/1	1/2	0/3	5/10
Lincoln	2/2	1/1	1/1	2/2	1/1	1/1	8/8
Sibley	2/2	1/1	0/0	1/1	1/1	0/1	5/6
Total	9/9	4/4	1/1	3/5	4/6	1/5	22/30 73% response rate

Baseline comparison: Response rate was 80% on baseline survey compared with 73% at follow-up.

I. Results

Question 1: Are/were you a member of the school Integrated Pest Management (IPM) team? (N = 22)

All respondents were members of the IPM team for either the 1999-2000 or 2000–2001 school years. Eighty-one percent of respondents were IPM team members for the 1999-2000 school year (18/22) and 95 % (21/22) were members for the 2000-2001 school year. Seventy-seven percent of respondents (17/22) were IPM team members for both years.

Question 2: Which of the following best describes your role at the school? (N = 22) Numbers of responders in each category:

- Principal = 4
- Teacher/ECFE = 5
- Custodian = 4
- Health professional/aide = 3
- Parent = 1
- Food services = 1
- District Grounds and Facilities staff = 4

Question 3: I attended the following IPM training sessions with Bobby Corrigan. (N = 22)

Three responders, 14%, did not attend an IPM training. Eighty-one percent (18 people) attended the April 2000 Bobby Corrigan training, while 18% (4) attended the March 2001 training.

Question 4: Please rate the value of the following activities conducted for the IPM project, which you participated in. (N = 22) *Total responses in each category.*

	Very valuable	valuable	Not valuable	Did not participate
IPM team meetings	2	18		2
Staff presentation	5	8		7
PTA presentation	1	4		15
ECFE presentation	2	3		13
Student activities	2	5		11
Community education events:	2	4		12
1. Dr. Warren Porter				
2. Jay Feldman, NCAMP	2	1		14
3. Dr. Philip Landrigan	2	2		13
4. Chemical-Free Lawn Care	4	1		12
Newsletter	2	7		3 - Did not see

100 percent of those who participated in the above activities rated them valuable to very valuable. The majority of those surveyed did not attend the PTA or ECFE presentations or the student activities. Only four team members attended any of the community presentations. Numbers from each school who attended a community presentation were: Como = 1; Randolph Heights = 0; Lincoln = 2; and Sibley = 1. Two responders attended more than one community presentation.

Question 5: Our school has implemented the following elements of integrated pest management. (N = 18) *Number of responses in each category and percent of responders checking the following items.*

<u>15</u>	<u>(83%)</u>	Have an IPM plan
<u>13</u>	<u>(72%)</u>	Structural repair e.g. sealing cracks so pests can't get in
<u>17</u>	<u>(94%)</u>	Good sanitation
<u>16</u>	<u>(89%)</u>	Monitoring & reporting of pests
<u>12</u>	<u>(67%)</u>	Preventive food practices e.g. policies about food in classrooms
<u>14</u>	<u>(78%)</u>	Use of pesticides only as a last resort
<u>11</u>	<u>(61%)</u>	Use of least toxic alternatives, if pesticides are necessary
<u>8</u>	<u>(44%)</u>	Recommending non-toxic head lice treatments & prevention
<u>10</u>	<u>(56%)</u>	Least-toxic lawn care
<u>0</u>		Other

Although all of the above elements are contained in each school's IPM plan, responses for the above categories ranged from 44% (recommending non-toxic head lice treatments) to 94% (good sanitation). Since the question focused on "implementation of IPM", responses reflect perceptions about actual implementation rather than their inclusion in the IPM plan. The highest proportion of respondents thought that sanitation (94%) and monitoring and reporting of pests (78%) had been implemented. It is notable that only 83% of respondents said that the school had an IPM plan.

Baseline comparison:

- No schools had an IPM plan at baseline.
- It appears that the following practices existed at baseline and **were not** significantly affected by implementing an IPM plan:
 - Structural repair
 - Sanitation
 - Use of pesticides as a last resort
 - Use of least toxic alternatives
 - Recommending non-toxic head lice treatments
 - Least toxic lawn care
- The following practices appeared to **increase** after IPM implementation:
 - Monitoring and reporting of pests
 - Preventive food practices

Supplementing the above information, district facilities and grounds staff commented that they have seen greater awareness of IPM practices by custodians and kitchen staff, with changes in food practices and more frequent emptying of garbage cans. The St. Paul school district grounds supervisor said there is closer attention to turf maintenance issues and that the turf plan has been helpful. Turf maintenance practices are also being used at other St. Paul schools. However, roadblocks to effective IPM for grounds are the lack of funding for necessary equipment, like grass cutting machines and the need for more grounds maintenance staff.

Question 6: Based on your experience, please rate the awareness of the following groups about your school's IPM plan. (N = 22) *Number of responses in each category.*

	Very aware	Somewhat aware	Not aware	I am unable to assess
Principal	15	3		
Teachers	3	14		2
Parents		12	2	4
Students	2	12	1	3
Custodial staff	16	4		
District facilities & grounds staff	16	3		3
Other school staff		11	3	5
Pest control company	11	2		7

The highest ratings (most aware) were for the principal, custodial staff, district facilities and grounds staff and the pest control company. Six people rated parents, students and other school staff as “not aware.” Everyone else who made an assessment rated school participants as somewhat to very aware.

Baseline comparison: Although this question was not directly asked in the baseline survey, we can extrapolate levels of awareness from baseline survey responses. At baseline, most IPM team members were uninformed about pest management practices and when and if pesticides were used on the grounds or in the building. As noted in the follow-up survey, only six responses rated some school participants as “not aware”. Of course, responses to this question reflect subjective opinions about awareness and do not measure actual awareness. Results for question 11 provide a more objective measure.

Question 7: In my opinion, the following are barriers to awareness of IPM in our school. (N = 18) *Number of responses in each category and percent of responders checking the following items.*

- 4 (22%) Lack of information
- 8 (44%) Lack of interest
- 15 (83%) People are too busy
- 11 (61%) IPM is less important than other issues

The most common barriers which responders checked were “people are too busy” (83%) and “IPM is less important than other issues” (61%). Only 22% thought that “lack of information” was a barrier and only 44% checked “lack of interest”. Principals and teachers were more likely to check “IPM is less important than other issues” (8/9) than were custodians or district facilities and grounds staff (3/8).

Question 8: On a scale of 1-10, please rate the importance of IPM to your school, compared with other issues in your school. (N = 20)

Responses to this question ranged between 2 (most important) and 9 (least important), with 4 or 5 being the most common responses (9 people). Of 20 responses, 12 people or 60 % rated IPM between 2 and 5 in importance. Forty percent (8 people) rated IPM between 6 and 9 in importance, compared with other school issues. There appeared to be few clear patterns among categories of responders, with a couple of exceptions. There was a tendency for district facilities and grounds staff to rate IPM of higher importance (2,5) than principals (5,6,7,9) for example. Health personnel (3,4,5) and the one parent (4) generally rated IPM of higher importance than other responders.

Question 9: What is your opinion about the importance of Integrated Pest Management (IPM) in schools? (N = 21) *Number of responses in each category and percent of responders checking the following items.*

IPM is important, because:

- 21 (100%) It helps protect the health of students and staff
- 18 (86%) It has a prevention focus
- 14 (67%) I’m concerned about pesticides being used in schools
- 19 (90%) It encourages good maintenance practices
- 3 (14%) Other, please specify:

- I use at home.
- Students will take the information home.
- Increasing rates of allergies and autoimmune problems in schools.

IPM is not important, because:

- not a health concern
- 1 (5%) not a problem here
- Other, please specify

Generally respondents checked all four reasons, with “*I’m concerned about pesticides being used in schools*”, being the least selected reason (67% versus 86 to 100% on the other reasons). Among principals and teachers, 9 out of 9 checked all four reasons. All of the custodians and district facilities and grounds staff checked all boxes but “*I’m concerned about pesticides being used in schools.*” However, 3 out of 8 (38%) also checked this item. Three people gave additional reasons: students and teachers could use the information at home and the observation that more people have allergies and immune problems. One respondent said IPM was not important because their school did not have pest problems, but that same respondent also checked all four responses under *IPM is important*. **These results show that there is a consensus among IPM team members that IPM is important, with the strongest reason (100% of responders) being “It helps protect the health of students and staff.”**

Question 10: Are you aware of any of the following pest problems in your school? (N = 19) *Number of responses in each category and percent of responders checking “problem or big problem.”*

Pest	Big problem	problem	% checking problem or big problem	Not a problem	Don’t know
ants	1	13	74%	2	
mice or rats	1	6	37%	9	
cockroaches		3	16%	10	2
flies		5	26%	8	2
bees, wasps or yellow jackets	2	10	63%	3	1
weeds	1	7	42%	4	2
head lice	2	11	68%	3	1
Other*		2- moths, “bugs”	16%		

Although there were responses in every pest problem category, responders checked the following pest problems most often: ants (74%), mice (37%), bees/wasps (63%), weeds (42%), and head lice (68%). Results by school are similar, with responders from all four schools checking ants, bees and weeds. The two St. Paul schools also checked rodents and Lincoln responders checked all of the pests. Head lice was selected as a problem only by the elementary school responders and was not perceived as a problem at Como.

Comments by the Como PCO representative indicate that there are ongoing problems with mice and ants in all St. Paul schools.

Baseline Comparison:

- Generally results are consistent with pests reported at baseline.
- All four schools reported problems with weeds at baseline and follow-up.
- All 3 elementary schools reported problems with head lice at baseline and follow-up.

- Lincoln and Sibley responders checked ants and bees/wasps as a problem at baseline and follow-up. Some responders at follow-up noted additional pests.
- Como and Randolph responders checked ants, rodents, bees/wasps at baseline and follow-up.

Question 11: How many times were pesticides or herbicides used in and around your school during the 2000 – 2001 school year? (N = 19)

Since the survey results showed that many IPM team members were unaware of pesticide use, the survey information was supplemented with interviews with the Ecolab (PCO) service representatives for two of the three schools which use Ecolab: Como and Sibley. We were unable to make contact with the PCO rep serving Randolph Heights. In addition, we reviewed the Ecolab logs for these three schools. For Lincoln, we interviewed the district facilities and grounds staff person to obtain information on indoor use of pesticides. In addition, we interviewed the district grounds and facilities staff for each school to obtain information on actual use of lawn and garden pesticides.

Number and percent of responses in each category.

In the building		Percent selecting	Actual per logs*	Actual per PCO*
never	6	32%	Randolph	Lincoln, Sibley,
1 – 2 times	5	26%	Como	
3 times or more	1	5%	Sibley	Como
Don't know	7	37%	NA	NA

*Sibley, Como and Randolph only. No log available for Lincoln, since they do not contract with a PCO. District staff was the source for Lincoln.

Number and percent of responses in each category.

On the grounds		Percent selecting	Actual per district staff
never	7	37%	Lincoln, Sibley
1 – 2 times	1	5%	RH, Como
3 times or more	0	0%	0
Don't know	8	42%	NA

A high proportion (37 – 42%) of people did not know if pesticides were used in and around the school. Thirty-two to 37 % said they were never used during the study year. Twenty-six percent said they were never used in the building, while 5% said they were never used on the grounds. Only 5% thought they were used three times or more in the

building. Generally responders either did not know whether pesticides were used or thought they were never used (69-79%).

Actual experience showed that pesticides were never used in the Randolph or Lincoln buildings. According to the PCO service representative, at Como rodent baits (*Maki Bait Packs*, EPA Reg. #: 7173-215, Toxicity Category III) were used once in the tunnels during winter break and *ZP Tracking Powder* (EPA Reg.#: 12455-16, Toxicity Category III) was applied twice to cracks and crevices, during winter break and again in March 2001. Although the PCO said that pesticides were not used at Sibley, the PCO log showed that they were used three times in the study year. The pesticides used at Sibley were *Tempo SC Ultra* (EPA Reg.#: 3145-498, Toxicity Category III) used twice for ants and *Borid* (EPA Reg #: 9444-129, Toxicity Category III) used once for cockroach control. Comparing survey responses to actual experience at Randolph showed that only one person was aware that they were never used. For Lincoln three people answered correctly that no pesticides were used. One Sibley responder (district facilities and grounds staff) answered correctly that pesticides had been used 3 times in the study year. Most Como responders answered that pesticides were used 1-2 times per year in the building, while actual use was three times. Herbicides were used on the grounds of St. Paul schools, but were not used at Lincoln and Sibley. Most Lincoln and Sibley responders were aware that herbicides were not used in the study year. One Randolph respondent said they were never used on the grounds, compared with actual use at twice per year. Only one Como responder accurately responded 1-2 times per year. It appears the Lincoln team, with the highest proportion of accurate responses (50%), is the most aware of actual pesticide use in their school.

Baseline Comparison:

Pesticide use in the Baseline Year (1998-1999) Compared With the Follow-Up Year (2000-2001)				
	Baseline use in building	Follow-up use in building	Baseline use on grounds	Follow-up use on grounds
Como Park High	0	3	0	2
Randolph Heights Elementary	0	0	0	2
Lincoln Elementary	0	0	2	0
Sibley Elementary	1	3	2	0

Basically implementing IPM did not reduce the use of pesticides in the St. Paul Schools. The use of pesticides on the grounds increased because the St. Paul schools had a moratorium on pesticide use during the baseline study year. St. Paul schools resumed minimal herbicide use in the 1999-2000 academic year. Thus, the St. Paul schools reflect an increase in pesticide use on the grounds after implementation of IPM and for Como an increase in use in the building. In addition, survey responses do not reflect verbal comments we have heard about the use of *Round-Up* (EPA Reg.#: 524-436, Toxicity Category II) by custodians on fence-lines at the St. Paul schools for weed control.

Lincoln reduced the use of herbicides. Use of pesticides in the building increased at Sibley from one to three times.

Another change in pesticide use, which is not reflected by the survey results, was a decision not to use any organophosphate pesticides in any of the schools. The custodians at the two St. Paul schools previously stored supplies of *Diazanone* for ant control. District staff removed the supplies of *Diazanone* from the school buildings. We observed another change at Sibley, the custodian now uses homemade pesticide-free yellow jacket baits, instead of chemical wasp and hornet treatment.

Question 12: In my opinion, pesticides should be used in our school building: (N = 21) *Number of responses in each category and percent of responders checking the following items.*

 (0%) Whenever a pest is sighted
 (0%) On a regular basis e.g., weekly, monthly
20 (95%) Only as last resort
 1 (5%) Never

Ninety-five percent of people said pesticides should be used only as a last resort in the school building. These results are consistent with the definition of IPM. When we include the one response that pesticides should never be used, 100% of responders thought pesticides should never be used or used only as a last resort.

Question 13: In my opinion, herbicides (weed killers) should be used on school grounds: (N = 21) *Number of responses in each category and percent of responders checking the following items.*

 (0%) On all grounds on a regular basis to eliminate weeds
 6 (29%) On some of the grounds on a regular basis to eliminate weeds
10 (48%) As a last resort to eliminate weeds
 5 (24%) Never

Seventy-one percent of responders thought that pesticides should never be used or used only as a last resort on the grounds. Forty-eight percent of people said pesticides should be used only as a last resort, while 24% said they should never be used. An additional 29% said that herbicides should be used on some of the grounds on a regular basis to eliminate weeds. The responses of these IPM team members are consistent with our IPM plans, which call for the use of herbicides as a last resort and occasional use as a preventive practice.

It appears that team members are more open to pesticide use on the grounds (29%) than in the building. However, these results are most likely due to the wording of the

questions. Question 13 gave an option of “*On some of the grounds on a regular basis to eliminate weeds*”, while there was no such category for question 12. However, responders did appear to have stronger feelings about pesticide use on the grounds. Twenty-four percent said never use on grounds versus 5% say never use in the building. This difference may reflect people’s discomfort with pests in the building and wanting to retain the ability to tackle a pest problem if it comes up.

Question 14: The basic components of Integrated Pest Management (IPM) include:

- monitoring
- identification of pests
- good building maintenance
- recording-keeping on actions taken
- use of least toxic pesticides only as a last resort
- policies on where and how food is stored
- good cleaning practices
- policies on pest tolerance

A successful IPM program is one in which these components of IPM have been implemented and pest problems in and around the school are prevented. Using this definition of success, please rate the success of IPM at your school.

(N = 18)

Seventy-eight percent rated the IPM in their schools as successful to very successful. Twenty-eight percent (5/18) rated IPM as very successful, while fifty percent (9/18) rated it successful. Twenty-two percent (4/18) rated it somewhat successful. No responders rated the IPM program as unsuccessful. One person commented that IPM was not successful in the building for Como and Randolph Heights, but did not give a rating.

Ratings by School	Very successful	successful	Somewhat successful	Not successful
Como Park High	0	1 of 2 (50%)	1 of 2 (50%)	0
Randolph Heights Elementary	0	1 of 3 (33%)	2/3 (67%)	0
Lincoln Elementary	1 of 8 (12%)	7 of 8 (88%)	0	0
Sibley Elementary	4 of 5 (80%)	0	1 of 5 (20%)	0

In general, the Lincoln and Sibley teams rated the project more successful than did the St. Paul school teams. There were also fewer responders for the St. Paul schools.

II. Summary of Results: Baseline and Follow-up

- **Information level of team members.** At baseline most school team members were uninformed about pest management practices and when and if pesticides are applied in and around school buildings or on the grounds. There appeared to be some improvement in information level at follow-up. More people seemed to be aware of the importance of IPM practices. The follow-up survey asked about barriers to awareness of IPM. The barrier most often cited (86% of responders) was “*people are too busy.*”
- **Decisions concerning pest management.** At baseline, decisions concerning pest management, whether or not to use pesticides and which pesticides to use, when and where are made by district staff, custodians and the contracted PCO. This did not change at follow-up, which could explain why most team members could not accurately report on pesticide use. One PCO service representatives noted that one change since the passage of the *Parent’s Right to Know Act*, is the requirement to notify the district facilities staff person and principal, before application of pesticides in the building.
- **IPM Plan.** At baseline, none of the schools had an overall pest management plan. An IPM plan for each school was developed and implemented in Fall 2000.
- **Implementation of IPM techniques.** Sanitation, maintenance practices and use of the least toxic pesticides as a last resort were implemented at baseline, so there was little change at follow-up. There appeared to be some increase in monitoring and reporting of pests and preventive food practices, after IPM implementation. Although not reported on the survey, there seemed to be a greater awareness by head custodians about exclusionary measures like door sweeps, sealing of cracks and crevices etc. due to the walk-through inspection which occurred in Summer or Fall 2000.
- **Notification.** At baseline, team members reported that notification of pesticide use is provided in one school, while the other three schools provided no notification of indoor use. Signs are generally posted when pesticides are used on grounds. This question was not asked in the follow-up survey.

One change in the follow-up study year was a new requirement for parent notification by the *Parents’ Right to Know Act*. Minnesota state law requires schools to notify parents at the beginning of each school year of any planned pesticide applications and to inform them that they may also request individual notification of any additional applications. Very few parents in the four schools requested notification, five parents from Como and none from the other schools.

- **PCO Use.** There was no change at baseline and follow-up. Three schools use contracted PCOs to monitor and manage pest problems indoors, while Lincoln does not.
- **Custodian use of pesticides.** At baseline, custodians were authorized for limited use of pesticides. This changed at follow-up, with Sibley and Lincoln custodians no longer using pesticides and the St. Paul school custodians limited to use of *Round-Up* on fence-lines.
- **Use of pesticides indoors.** At baseline, only Sibley reported use of pesticides in the building. Indoor use increased from zero to three times after IPM implementation.

Lincoln and Randolph used them in neither the baseline nor follow-up years, while Como increased use from a reported zero in the baseline year to three times in the follow-up year.

- **Use of pesticides outdoors.** At baseline, Sibley and Lincoln used TruGreen Chemlawn, which sprayed 1-2 times per year for weed control, while the St. Paul Schools had not been sprayed for two years. In the follow-up year, neither Sibley nor Lincoln used herbicides on the grounds, while the St. Paul schools increased use from zero to 2 times per year.
- **Pest problems.** At baseline, minor pest problems were identified, including, mice, ants, bees/wasps, flies, dandelions and broadleaf weeds. Head lice were also a big problem in the three elementary schools. These same pest problems were also reported at follow-up.
- **Health complaints.** No health complaints associated with pesticide exposure were reported at baseline, but only two schools reported monitoring this. This question was not included in the follow-up survey.
- **Effectiveness of the pest management program.** At baseline, most respondents thought that the pest management program was effective and that non-chemical pest control would also be effective. At follow-up, 78% of responders rated the IPM program as successful or very successful.
- **Costs.** We were able to track PCO and pesticide use costs before and after IPM implementation. Additional costs for maintenance and equipment were not available. We asked district facilities staff if building costs had changed with IPM. They indicated that there had been no change in costs. The schools using PCOs had not increased their contracted rates for the PCO services due to IPM implementation.

For grounds maintenance, there was no change in costs for Lincoln and a reduction in cost for Sibley. The St. Paul schools had an increase in costs, since they did not use TruGreen Chemlawn in the baseline year, but did in the follow-up year. One issue identified by the grounds supervisor for St. Paul schools was the lack of funding for lawn care equipment. IPM requires more frequent mowing, additional equipment, as well as landscape design changes like mow strips under fence lines. These items are not currently in the budget.

Annual Pest Management Costs at Baseline Compared With Follow-Up				
	Facility costs Baseline	Facility Costs Follow-up	Grounds Costs at Baseline	Grounds Costs at Follow-up
Como	\$756	\$756	unknown	\$200
Randolph Heights	\$424	\$424	\$25	\$200
Lincoln	\$10	\$10	\$1,000	\$0
Sibley	\$576	\$576	unknown	\$0

- **Importance of IPM.** The follow-up survey included questions on the importance of IPM and reasons for its importance. These questions were not asked in the baseline survey. On a scale of 1=most important to 10=least important, 60% rated IPM between 2 and 5 in importance. Most responders said that it was important because it helps protect the health of students and staff, it has a prevention focus and it encourages good maintenance practices. The majority of responders also said they were concerned about pesticide use in schools.
- **Opinion on use of pesticides in the schools.** In the follow-up survey, 100% of people said pesticides should never be used or used only as a last resort in the building and 71% had this opinion about pesticide use on the grounds.

III. Conclusions

The project appears to have heightened awareness of IPM among IPM team members. Most team members found the IPM project activities, including training sessions, team meetings and community events to be helpful. Most team members affirmed the importance of IPM, especially to protect the health and safety of students and staff.

Although it appears that pesticide use increased in the St. Paul schools, it is important to understand that the baseline year was anomalous. The St. Paul School District had a ban on all pesticide and fertilizer use for a two-year period, one of which was the baseline study year. This approach was not true IPM. IPM requires a comprehensive approach, including preventive practices to avoid pests. For example, IPM should include sound turf management practices like aeration, fertilization and the occasional use of pre-emergent herbicides on school grounds to prevent future problems, which could then require the use of more herbicides. The resumption of pesticide use in the St. Paul schools coincided with the follow-up study year. Because weed problems had increased due to previous practices, the use of herbicides was used to alleviate weed growth which occurred during the period of the pesticide ban. This highlights the difference between IPM and a “no pesticide” approach.

For Sibley and Lincoln, the implementation of IPM resulted in a reduced use of pesticides on the grounds. Lincoln had a “no indoor use” policy before and after IPM implementation. Sibley increased use indoors, as did Como.

Problems with ants, mice, bees/wasps and weeds are endemic and will continue to be an ongoing challenge for all schools. Head lice also remain a challenge in the elementary schools.

As noted in the baseline survey report, the four schools participating in this study may not be typical in their cautious use of pesticides. Also, they had already been practicing IPM approaches to pesticide use and in good sanitation, as evidenced by survey results and facility “walk throughs” conducted by Dr. Robert Corrigan, our school IPM trainer and our Summer/Fall 2000 inspection walk-throughs. Their participation in this project shows that they are not threatened by outside consultants evaluating their pest management

practices, because they are already doing many things right. Thus, these schools may be above average in these areas, leaving the possibility that the below average schools have further to go. If this project were successful in implementing IPM in above average schools, identifying and working with the schools that have significant pest problems would be the next logical step.

Part 3: School and Community Education Efforts

I. School Education

Successful implementation of IPM in a school environment requires the participation of the entire school community. With this in mind, we attempted to educate members of the school community using the following strategies:

A. IPM Team Member Training

School teams, project staff, agency staff and other community representatives attended a one day workshop in April 2000, conducted by Dr. Robert Corrigan and Dr. Tim Gibb on IPM in schools. Dr. Corrigan of *RMC Pest Management Consulting* is a national expert on school IPM and Dr. Gibb from Purdue University is an expert on school turf and grounds issues. This training included a walk-through at three of the schools to identify potential pest problems or issues, which should be included in IPM plans. The training was videotaped at one site and was available to those who could not attend the training. Team members told us they thought the training was excellent and they had learned a lot.

In addition, a follow-up training/technical assistance session was offered with Bobby Corrigan. Bobby met individually with the Sibley and Lincoln teams at each of their schools in the morning. These were informal sessions to talk about problems and seek Bobby's advice. In the afternoon, we invited the St. Paul teams to an IPM overview session and informal discussion. Because we had several new team members at Randolph and Como, we wanted to offer them training. The afternoon session was poorly attended, but those who attended said it was very helpful

B. Teacher Education

Faculty presentations were given at each school. Generally, these were brief presentations on the project and IPM implementation in the school. However, at Randolph Heights we were able to offer a more extensive presentation, which covered the health effects of pesticides and broader environmental health issues.

C. Parent Education

We offered a PTO presentation at each school. Generally, PTO meetings were small, with less than twenty parents at each session. However, many parents commented that they received valuable information that they could also use at home. At Randolph Heights, many teachers also attended the PTO session.

D. Student Education

We offered student activities at each school, including:

- **Sibley Elementary** undertook an ambitious enrichment program on the environment, culminating in a Student Environmental Fair. IPM team member and third grade teacher, Terry Heil organized the program and project staff gave presentations and helped line up presenters on various topics, including: indoor air quality, healthy cleaning, composting, butterfly gardens, chemically-free lawn care, prairie restoration, garbage and recycling, and many others. The program was offered to all grade levels, with each student selecting an education module to pursue. The students displayed their work at a Spring Environmental Fair which was attended by parents and friends.
- **Lincoln Elementary** participated in district-wide Student Health Fairs at two locations by staffing a table to distribute chemical-free lawn care information. Over 1600 students attended these events and took home our information.
- At **Randolph Heights**, Doug Nienhuis, IPM team member and science teacher, used the Department of Agriculture's *Pest Patrol* workbook with his students to teach them about pests and IPM. We also brought in speakers on deformed frogs and worm composting, which the students seemed to enjoy.
- At **Como Park Senior High**, project staff worked with IPM team member and environmental science teacher, Robert Griffiths to educate the students about pests and IPM. Kathleen presented to all the environmental science classes in Spring 2001. Mr. Griffiths then worked with student volunteers to tackle IPM right in the environmental science classroom. The students had identified mice and ant problems in the room. Mr. Griffiths gave students extra credit for doing a room inspection and clean-up, based on what they had learned about IPM.
- Kathleen also gave presentations at **Bancroft Elementary** and **Windom** schools in Minneapolis on pesticides, pests and IPM.

E. Posters and Newsletters

We developed a "*Stop These Pests*" poster to be displayed in all the schools, reminding students and staff that they can help keep pests put of the school by cleaning up after themselves and reporting pests to the custodian. We disseminated two newsletters to students and staff. The first, describing the project and IPM, was distributed in Fall 2000. The second was sent out in Spring 2002 and provided an update on the project and an article about what parents can do to protect their children from environmental health threats at home. In most cases, the newsletters were inserts to the regular school newsletter.

II. Community Education

In an effort to educate both the school and the broader community, the project sponsored several community education seminars, did written articles and media spots and met with many interested groups.

A. Community Education Events

- Two presentations by **Dr. Warren Porter**, an Entomologist and Toxicologist from the University of Wisconsin, who has done animal research on health effects of background levels of pollutants in drinking water.

- Two presentations by **Jay Feldman**, Executive Director of the *National Coalition Against the Misuse of Pesticides*, who has led a national campaign to reduce the use of pesticides in schools and other environments.
- Two presentations by **Dr. Phillip Landrigan** of Mt. Sinai Medical Center. On October 5, 2000 he presented at the Westminister Town Forum and the University of Minnesota School of Public Health. The Town Forum speech was broadcast live on MRP and rebroadcast later that day. Dr. Landrigan also did one radio and one television interview.
- **Chemical-free Lawn Care Information.** In an effort to educate families about how they can have healthy lawns without using chemicals, in collaboration with *Women's Cancer Resource Center* and the *Minnesota Children's Health Environmental Coalition* we developed a handout on *Chemical-Free Lawn Care* and sponsored the following events:
 - **Lawn care seminars** in Plymouth, Minneapolis, St. Paul and Rochester. About 120 people total attended one of the above seminars between March and May 2001.
 - **Lawn care information tables** at Sibley Environmental Fair and the Faribault Schools Health Fair in April 2001.

B. Outreach

- **Written articles and publicity.** Project staff wrote and published articles about the project in the NEC newsletter, *Curbsider* and did radio interviews.
- **Other meetings.** Project staff met with numerous groups and individuals to educate them about pesticides and IPM and to learn more about other community efforts on this issue, including: various members of the medical community in Faribault and the Twin Cities; college classes; researchers at the University of Minnesota; environmental groups; community groups; and others. We also did several presentations and distributed information at conferences and other events.

For these outreach meetings Judy mostly concentrated on outreach to groups in Faribault and Northfield, while Kathleen concentrated on the Twin Cities area. Judy's efforts to reach out to the medical community are notable and include meetings with or presentations to the following groups among others: Rice County Health Advisory Committee; Faribault District One Hospital; nursing classes at South Central Technical College; Northfield Lions; City of Northfield Environmental Planning Committee; and a group of retired college professors from St. Olaf and Carleton Colleges in Northfield.

- **Responses to inquiries on pesticides and IPM.** The project co-coordinators and staff at NEC responded to numerous phone calls and disseminated information to interested groups and individuals.

III. Early Childhood Family Education Presentations

Since it has been difficult to get parents involved in the IPM project at our schools, we thought that parents of young children attending Early Childhood Family Education (ECFE) classes would be more motivated to learn about how to protect their children. Project staff gave 33 Early Childhood Family Education (ECFE) presentations on children's environmental health. Judy gave 15 presentations to classes in the Faribault ECFE program and Kathleen gave 18 presentations to ECFE classes in St. Paul and a few in Minneapolis. Presentations were based on a curriculum developed by Kathleen for an ECFE class she taught in Hopkins in Spring 2000. The presentations covered the following: description of the toxins we are concerned about; information on the health effects in children; and actions parents can take to protect their children. Participating parents received a packet of information which included: lead, mercury in fish, toxins in plastics, pesticides in food, healthy cleaning, chemical-free lawn care, indoor air quality, etc. In addition, at some of the classes we showed a 15-minute film developed by the *Children's Health Environmental Coalition*, entitled *Not Under my Roof- Protecting Your Baby From Toxins at Home*. We used the film more with the newborn classes.

After each class, we administered a brief questionnaire, which was completed by 140 participants. Mothers, who made up the bulk of the participants, completed 120 of these forms, or 88% of those answering this question (N=137). The remaining forms were completed by fathers or by both parents.

Results show:

- ***Please rate the value of the session to you as a parent.*** 96% of parents rated the session valuable to very valuable (56% very valuable, 40% valuable, 4% somewhat valuable). No one rated the session *not valuable*.
- ***I would attend additional session on one of the above topics, if they were offered.*** Ninety-five percent said they would attend additional sessions, if offered.
- ***Has this session motivated you to change your home or community environment in any way to better protect your children from environmental health threats?*** Eighty-one percent said they were motivated to make at least one change.
- ***If yes, name one thing you would do differently as a result of what you learned in this session.*** (N=134) The most common responses were the following:
 - 51% said they would use healthy cleaning products or reduce chemicals in the home.
 - 21% said they would do chemical-free lawn care.
 - 10% said they would try to buy more organic foods.
 - 8% said they would inspect their home for lead.
 - Other changes named by more than one responder were: better cleaning of produce, not micro-waving in plastic, doing IPM, seeking additional information, safer toys and baby bottles, wiping feet before entering home, reduce use of PVC products, reduce asthma triggers and educate others.
 - Areas for change named by one responder each were: product labeling, food allergies, mosquito sprays, water quality, allergens, mercury thermometers, breast milk safety, dry cleaning and radon.

- **Some parent comments:**
 - “Thank you for this very insightful and valuable information. It made me think about what’s in the house.”
 - “Very informative. People just trust marketing, etc. on products. It’s nice to hear the studies etc. being done on products most people trust.”
 - “We live in a world that likes to ignore all the toxins we’re exposed to. I applaud you for speaking out and helping people become more aware.”
 - “This was a very good presentation. I would highly recommend it to others.”
 - “A real eye-opener.”
 - “Thank you very much. It is overwhelming, but it is better to be informed than ignorant.”
 - “Thanks for coming to our class. You may have helped keep our children safe and healthy.”

In conclusion, the parents who attended these classes generally found them valuable, would attend additional sessions and said they would make changes to better protect their children. We surmise that these better-educated parents will make more environmentally friendly decisions as parents, consumers and citizens. Hopefully one outcome in the future will be a greater involvement in environmental issues, including pesticide use, in their children’s schools.

Part 4: Summary and Conclusions

I. Our Experience

Extent of pest problems. Participating schools, as evidenced by survey results and the initial walk-throughs, did not have big pest problems and were practicing many IPM techniques already at baseline. However, the follow-up survey showed that ants, bees/wasps/yellow jackets and weeds are chronic issues, as are mice in the St. Paul schools. These pests were also identified as the most common problem pests in the Department of Agriculture survey of 20 Minnesota schools. (*Pesticide Use, Storage and Integrated Pest Management Assessment In and Around State-Owned Buildings and Public K-12 School Buildings: A Report to the Minnesota Legislature*, January 15, 2001)

Use of pesticides and IPM. The four schools participating in this study may not be typical in their cautious use of pesticides. The Department of Agriculture study cited above found that 100% of the schools surveyed used pesticides both indoors and outdoors at least once a year. Our schools were already partially practicing IPM in their approaches to pesticide use and in good sanitary practices, as evidenced by survey results and facility “walk-throughs” conducted by Dr. Robert Corrigan, our school IPM trainer. Also, their participation in this project shows that they are not threatened by outside consultants evaluating their pest management practices, because they are already doing many things right.

As noted previously, the baseline experience for the St. Paul schools is distorted by the fact that the St. Paul School District had a policy banning all pesticide and fertilizer use for a two-year period, one year of which coincides with the study year. This is a cautious approach to pesticide use, which could potentially reduce student and staff exposures to pesticides, but it is not IPM. IPM as defined in this report requires a comprehensive approach, which includes sound turf management practices like aeration, fertilization and the maybe the occasional use of pre-emergent herbicides on school grounds to prevent future problems, which could then require the use of more herbicides. Thus the project provided an opportunity to test the effectiveness of IPM versus merely a “no pesticide” approach. Since there was zero pesticide use both in the buildings and on the grounds at baseline and pesticides were used after IPM implementation, based solely on a pesticide use measure it looks like IPM was not successful in the St. Paul schools. Since IPM involves more than just reducing pesticide use, this measure alone is insufficient in judging the success of the project.

Likewise, Lincoln had a no-pesticide use policy for the building both before and after project implementation, so on the pesticide use measure, it looks like the project made no difference. On this same measure, Sibley increased pesticide use indoors. Both Sibley and Lincoln eliminated pesticide use on the grounds.

Costs: We compared pesticide application costs before and after the project. Since the St. Paul schools had not been sprayed for two years, costs for grounds maintenance increased. Costs for Lincoln and Sibley decreased for grounds, since they did not contract with TruGreen Chemlawn, as in the baseline year. Building costs for Sibley and the St. Paul schools remained the same, as these costs involved only the monthly PCO visits with no additional IPM responsibilities. Lincoln used a PCO for the building in neither the baseline nor the follow-up year, so building costs remained the same.

However, we were unable to collect information on building maintenance and grounds maintenance costs. Thus, we do not know if the costs for these functions increased after IPM was implemented. In general, district facilities and grounds staff identified these costs as a potential roadblock to effective implementation of IPM. There is a limited budget devoted to both maintenance and pest management tasks by the school districts. If we want the PCO to take a greater role in IPM, they would need to be paid for these additional responsibilities. Alternatively, IPM tasks could be carried out by custodial staff. There is also a potential for increased costs for turf and grounds maintenance. IPM requires more frequent mowing, additional equipment, as well as landscape design changes like mow strips under fence lines. These items are not usually in the budget.

Parent notification. Minnesota’s new requirements for parent notification of pesticide use went into effect in August 2000, coinciding with IPM implementation in our schools. All schools are required to send a notice out at the start of the school year, giving the pesticide application schedule for routine applications and also informing parents that they have the right to request notification every time a pesticide is used. Notification is only required for pesticides with a toxicity level of I, II, or III. As noted, only five parents at Como requested notification, while no parents at the other three schools asked to be

notified. Como required that parents submit a self-addressed stamped envelope in order to receive notification. None of the parents complied with this requirement, so did not receive notification. The indoor pesticides used at Sibley and Como, *ZP Tracking Powder*, *Borid*, *Maki Bait Packs* and *Tempo SC Ultra*, are all at Toxicity Category III and would have required parent notification.

The new notification requirement did impact practices at our schools. The PCO representatives for Como and Sibley said that now they are required to notify the district facilities and grounds directors before they apply any pesticides in the building, so that the district can comply with the notification requirement. The Como PCO rep also said that the district is more cautious about bait treatments to the exterior of the building, which he feels might be helpful in reducing ant and mice problems. In general, it seems that these schools are more cautious about pesticide use, than they were before the notification requirement went into effect. St. Paul district's grounds supervisor said that the parent notification requirement keeps parents informed about pesticide use at the school and has helped with record-keeping.

II. Challenges

Changes in project staffing caused a slight slow-down in the project, as a new project coordinator was brought in mid-project. Although the Sibley and Lincoln teams were stable over the two years of the project, there were many changes in the Como and Randolph teams. At Como, we lost two teachers who were very committed to the project. We recruited one more teacher at Como, but the team was left with only 5 members. At Randolph, the custodian, a parent and one teacher left.

Sustaining interest and involvement of team members continued to be a challenge throughout the project. Principals and teachers are extremely busy and pest management is not their first priority. Basically, project staff developed the IPM plan team members reviewed and commented. Furthermore, most team members were not available for most of the summer. To address this, project staff completed as much work as possible with the custodial and district staff on developing the IPM plans. These challenges made collaborative work difficult.

We experienced diminished interest in the project in the second year. Without an IPM coordinator right at the school, keeping the focus on IPM, IPM practices might be harder to sustain over time, unless a champion of IPM within the school community came forward.

Parental involvement was minimal, which was disappointing. Ongoing accountability to parents is a key success factor for IPM. This project was not successful in engaging parents in this issue, even with efforts including PTO presentations and newsletters. Perhaps, parents would be more engaged if the school had more severe pest problems or if they had a child with sensitivities. It may be hard to sustain true IPM in these schools without ongoing involvement of parents.

III. Accomplishments

The follow-up survey showed that team members were much more knowledgeable about IPM than they were at baseline. The project clearly succeeded in heightening awareness and concern about pesticide use and the importance of IPM in these schools. However, without the focus of a project and project staff to assist with IPM planning, it is doubtful we would not have seen the same level of commitment to IPM practices.

The schools exceeded the goal of implementing at least three IPM strategies. Every school implemented the following:

- Annual inspection
- Preventive maintenance
- Better sanitation practices
- Food policies
- Use of least toxic pesticides
- Use of pesticides only as a last resort
- Recommending non-toxic head lice treatments
- Education of parents, teachers and students

These schools implemented IPM successfully, without incurring additional costs. The project proved that any school can do it, with a little bit of technical assistance and the commitment to make changes.

Only Lincoln met the goal of no pesticide use. The St. Paul schools did use lawn chemicals and Como and Sibley used pesticides indoors.

Student activities were successful in involving the students in IPM and environmental issues. The IPM efforts by Como's environmental science teacher and students illustrate a way for students to get involved in IPM at the classroom level. It is our hope that some of the students took information home resulting in heightened awareness by their parents.

The ECFE parent classes were very successful, as rated by participants and should results in positive changes at home and in the future in school environments.

The project's community education efforts have potential for increasing community awareness on pesticide use and other environmental issues.

There is good potential for adopting IPM district-wide in these three school districts. Both Northfield and Faribault school district facilities and grounds staff said their districts will consider adopting IPM. The St. Paul school district staff said that they are already doing many IPM practices district-wide and that IPM should eventually be adopted for all schools.

If you have questions about this report or would like more information about the project, please contact one of the Project Coordinators: Kathleen Schuler, St. Paul Neighborhood Energy Consortium, 651 222-7678 or Judy Chavie, Advocates for Better Health and Environment, 507-334-5179.

Integrated Pest Management Checklist

Building Exterior

Building exterior, playgrounds, parking lots, and athletic fields

Comments for maintenance

Y N	Is the area around the facility clear of weeds, grass, and brush?	_____
Y N	Is the fence line clear?	_____
Y N	Is there a 2 foot wide gravel strip around the building to prevent rodent burrowing?	_____
Y N	Are shrubs and trees near the building kept trimmed so that they do not touch the building?	_____
Y N	Are there cracks in the pavement or sidewalks?	_____
Y N	Is there standing water on the grounds that may attract pests?	_____
Y N	Are walls reasonably clean and free of dust, moss, etc.?	_____
Y N	Do windows or skylights have broken panes?	_____
Y N	Do open windows and vents have fine mesh screens to keep insects out?	_____
Y N	Have all holes and cracks been filled to remove hiding places or entry points for pests?	_____
Y N	Are there signs of rodent harborage or burrows?	_____
Y N	Are birds roosting or nesting in any exterior areas?	_____
Y N	Are roof gutters cleaned out regularly and free of debris?	_____
Y N	Are there lights on or near the building that may attract night-flying insects?	_____
Y N	Are exterior and perimeter bait stations and traps in place?	_____
Y N	Are exterior building vents screened properly?	_____

Loading docks

Y	N
Y	N

- Are pallets stacked away from the building?
- Are empty cartons and boxes broken down and taken to the dumpster or recycling bin as soon as they arrive?

Comments for maintenance

Dumpsters

Y	N
Y	N
Y	N
Y	N

- Are the lids secure on trash containers?
- Is there spillage, paper, or trash that may attract pests?
- Are outside trash containers placed at least 50 feet from doors?
- Is the frequency of garbage removal adequate (at least once per week)?

Exits and entryways

Y	N
Y	N
Y	N
Y	N
Y	N
Y	N

- Do doors close tightly?
- Are doors self-closing?
- Are all exit doors rodent-proof, without cracks or holes?
- Is weather stripping or door sweeps used to exclude pest entry?
- Are plumbing and electrical service entrances sealed?
- Are air curtains used?

Integrated Pest Management Interior Checklist

Building Interior

Offices and Classrooms

Comments for maintenance

Y N	Have all holes and cracks been filled to remove hiding places or entry points for pests?	_____
Y N	Are there loose wall coverings or floor tiles?	_____
Y N	Are walls and windows free of dust, cobwebs, etc.?	_____
Y N	Do trash cans have liners?	_____
Y N	Is trash removed regularly?	_____
Y N	Is there gum stuck under desks?	_____
Y N	Is pet food or snacks stored in secure containers?	_____
Y N	Are the floors vacuumed regularly?	_____

Garbage and trash areas

Y N	Is there accumulated trash, dirt, or debris?	_____
Y N	Is there adequate storage area?	_____
Y N	Are the lids secure on trash containers?	_____
Y N	Do trash cans have liners?	_____
Y N	Are grease drums on dollies?	_____
Y N	Are there recycling receptacles with liners for cans and bottles?	_____

Vending machines

Y N	Is there spillage or food debris?	_____
Y N	Are there excess goods under or behind equipment?	_____
Y N	Are there recycling receptacles with liners for cans and bottles?	_____

Food preparation and serving areas

Y	N	Are voids under and behind equipment clean?
Y	N	Are the surfaces of counters clean?
Y	N	Are ovens and stoves cleaned regularly?
Y	N	Are doors to areas self-closing?
Y	N	Are floor drains clean and operational?

Comments for maintenance

Dishwashing area

Y	N	Are floors cleaned regularly?
Y	N	Are floor drains clean and operational?
Y	N	Is there standing water anywhere that could attract pests?
Y	N	Is there mildew anywhere?
Y	N	Are mops hung upside down to dry?

Food storage area

Y	N	Is food stored at least 18 inches away from walls?
Y	N	Is there a painted line on the floor to indicate inspection aisles?
Y	N	Is food stored off the floor on adequate shelving?
Y	N	Are nonperishable products stored in cardboard boxes that rodents could invade?
Y	N	Is the storage area cluttered?
Y	N	Is there spillage or food residue?
Y	N	Is there evidence of rodent-chewed bags or nesting sites?

Staff lunchroom and lounge

Y N	Is food allowed in designated areas only?
Y N	Are tables, seats, and under booths clean?
Y N	Are the insides of trash containers clean?
Y N	Do trash cans have liners?
Y N	Are there adequate trash receptacles?
Y N	Are there recycling receptacles with liners for cans and bottles?
Y N	If there is a kitchen area, is it kept clean, including appliances?

Comments for maintenance

Utility closets and maintenance rooms

Y N	Are floor drains clean and operational?
Y N	Is plumbing free of leaks?
Y N	Are any drains clogged?
Y N	Is there standing water anywhere that could attract pests?
Y N	Is there condensation on pipes or equipment?
Y N	Are drip trays cleaned and emptied regularly?
Y N	Are mops and squeegees off the floor?
Y N	Are drums and pails on dollies or on shelves?
Y N	Are pipe chases sealed?
Y N	Are mops hung upside down to dry?

Rest rooms and locker rooms

Y N	Are lockers regularly inspected and cleaned?
Y N	Are areas on top of lockers clean?
Y N	Are doors to areas self-closing?
Y N	Is there standing water anywhere that could attract pests?
Y N	Are floor drains clean and operational?
Y N	Are toilets, sinks, and showers cleaned regularly and operational?

Other noteworthy rooms

Comments for maintenance

Home economics room

Y	N	Is food stored in secure containers?
Y	N	Are the counter tops clean?
Y	N	Are the appliances clean?
Y	N	Is there evidence of spillage or food residue?
Y	N	Is there a self-closing door?

Art room

Y	N	Are brushes and sponges clean and dry?
Y	N	Are water basins left out overnight?
Y	N	Are rags and paper towels promptly disposed of?
Y	N	Is there paper clutter?
Y	N	Are canvasses and supplies stored off of the floor and in an orderly fashion?

Laundry room

Y	N	Is there adequate ventilation to decrease humidity from dryers?
Y	N	Is there standing water anywhere that could attract pests?
Y	N	Are floor drains clean and operational?

Pool room

Y	N	Is there evidence of mildew on the floor tiles?
Y	N	Is there adequate ventilation?
Y	N	Is there an accumulation of damp rags or towels?

Reducing Pesticides in Minnesota Schools Pilot Project
School Pest Management Follow-up Survey - Spring 2001
Name of School _____.

***Integrated pest management (IPM)** is a process for managing pests in and around buildings using sanitation, maintenance, monitoring, pest identification and use of least toxic pesticides only as a last resort.*

1. **Are you/were you a member of the school *Integrated Pest Management (IPM)* team?** *Please check the appropriate box or boxes.*

_____ no or _____ yes. If yes, for which of the following school years?

_____ 1999 – 2000 school year

_____ 2000 – 2001 school year

2. **Which of the following best describes your role at the school?** *Please check the appropriate box.*

_____ Principal

_____ Parent

_____ Teacher

_____ District Facilities or Grounds staff

_____ Custodian

_____ Food services

_____ Health professional

_____ ECFE or after school program staff

_____ Aide

_____ Student

_____ Other, please specify _____.

3. **I attended the following IPM training sessions with Bobby Corrigan.** *Please check the appropriate box.*

_____ April 2000

_____ March 2001

_____ Did not attend a training

4. **Please rate the value of the following activities conducted for the IPM project, which you participated in.** *Please check all the boxes that apply.*

	Very valuable	valuable	Not valuable	Did not participate
IPM team meetings				
Staff presentation				
PTA presentation				
ECFE presentation				
Student activities				
Community education events:				
1. Dr. Warren Porter				
2. Jay Feldman, NCAMP				
3. Dr. Philip Landrigan				
4. Chemical-Free Lawn Care				
Newsletter				Did not see any.

5. **Our school has implemented the following elements of integrated pest management.** *Please check all that apply.*

- ☐ Have an IPM plan
☐ Structural repair e.g. sealing cracks so pests can't get in
☐ Good sanitation
☐ Monitoring & reporting of pests
☐ Preventive food practices e.g. policies about food in classrooms
☐ Use of pesticides only as a last resort
☐ Use of least toxic alternatives, if pesticides are necessary
☐ Recommending non-toxic head lice treatments & prevention
☐ Least-toxic lawn care
☐ Other, please specify _____.

6. **Based on your experience, please rate the awareness of the following groups about your school's IPM plan.** *Please check the appropriate box or boxes*

	Very aware	Somewhat aware	Not aware	I am unable to assess
Principal				
Teachers				
Parents				
Students				
Custodial staff				
District facilities & grounds staff				
Other school staff				
Pest control company				

7. **In my opinion, the following are barriers to awareness of IPM in our school.** *Please check all boxes that apply.*

- ☐ Lack of information
☐ Lack of interest
☐ People are too busy
☐ IPM is less important than other issues

8. **On a scale of 1-10, please rate the importance of IPM to your school, compared with other issues in your school.** *Please circle only one.*

most important 1 2 3 4 5 6 7 8 9 10 least important

9. What is your opinion about the importance of Integrated Pest Management (IPM) in schools? Please check all the boxes that apply.

IPM is important, because:

- _____ It helps protect the health of students and staff
 _____ It has a prevention focus
 _____ I'm concerned about pesticides being used in schools
 _____ It encourages good maintenance practices
 _____ Other, please specify

_____.

IPM is not important, because:

- _____ not a health concern
 _____ not a problem here
 _____ Other, please specify

_____.

10. Are you aware of any of the following pest problems in your school? Please check only one box for each pest.

Pest	Big problem	problem	Not a problem	Don't know
ants				
mice or rats				
cockroaches				
flies				
bees, wasps or yellow jackets				
weeds				
head lice				
Other*				

*Please specify _____.

11. How many times were pesticides or herbicides used in and around your school during the 2000 – 2001 school year? Please check the appropriate boxes.

	In the building	On the grounds
never		
1 – 2 times		
3 times or more		
Don't know		

12. In my opinion, pesticides should be used in our school building: *Please check the appropriate box.*

- ☐ Whenever a pest is sighted
- ☐ On a regular basis e.g., weekly, monthly
- ☐ Only as last resort
- ☐ Never

13. In my opinion, herbicides (weed killers) should be used on school grounds:
Please check the appropriate box.

- ☐ On all grounds on a regular basis to eliminate weeds
- ☐ On some of the grounds on a regular basis to eliminate weeds
- ☐ As a last resort to eliminate weeds
- ☐ Never

14. The basic components of Integrated Pest Management (IPM) include:

- monitoring
- identification of pests
- good building maintenance
- recording-keeping on actions taken
- use of least toxic pesticides only as a last resort
- policies on where and how food is stored
- good cleaning practices
- policies on pest tolerance

A successful IPM program is one in which these components of IPM have been implemented and pest problems in and around the school are prevented. Using this definition of success, please rate the success of IPM at your school. Please circle one of the following.

Very	successful	somewhat	not
Successful		successful	successful

Comments: _____

Date: _____ .

Name: (optional) _____.

PCO Questions

- 1. Differences in practices in school after IPM implemented?**
- 2. Differences in what they do?**
- 3. Differences in costs?**
- 4. Pest problems in school?**
- 5. Number times pesticides applied in building during 2000-2001 academic year?**

District Staff Questions

- 1. Differences in practices in school after IPM implemented?**
- 2. Differences in costs?**
- 3. Pest problems in school?**
- 4. Will the District adopt IPM district-wide?**
- 5. Opportunity to present final project results to school board or other groups?**