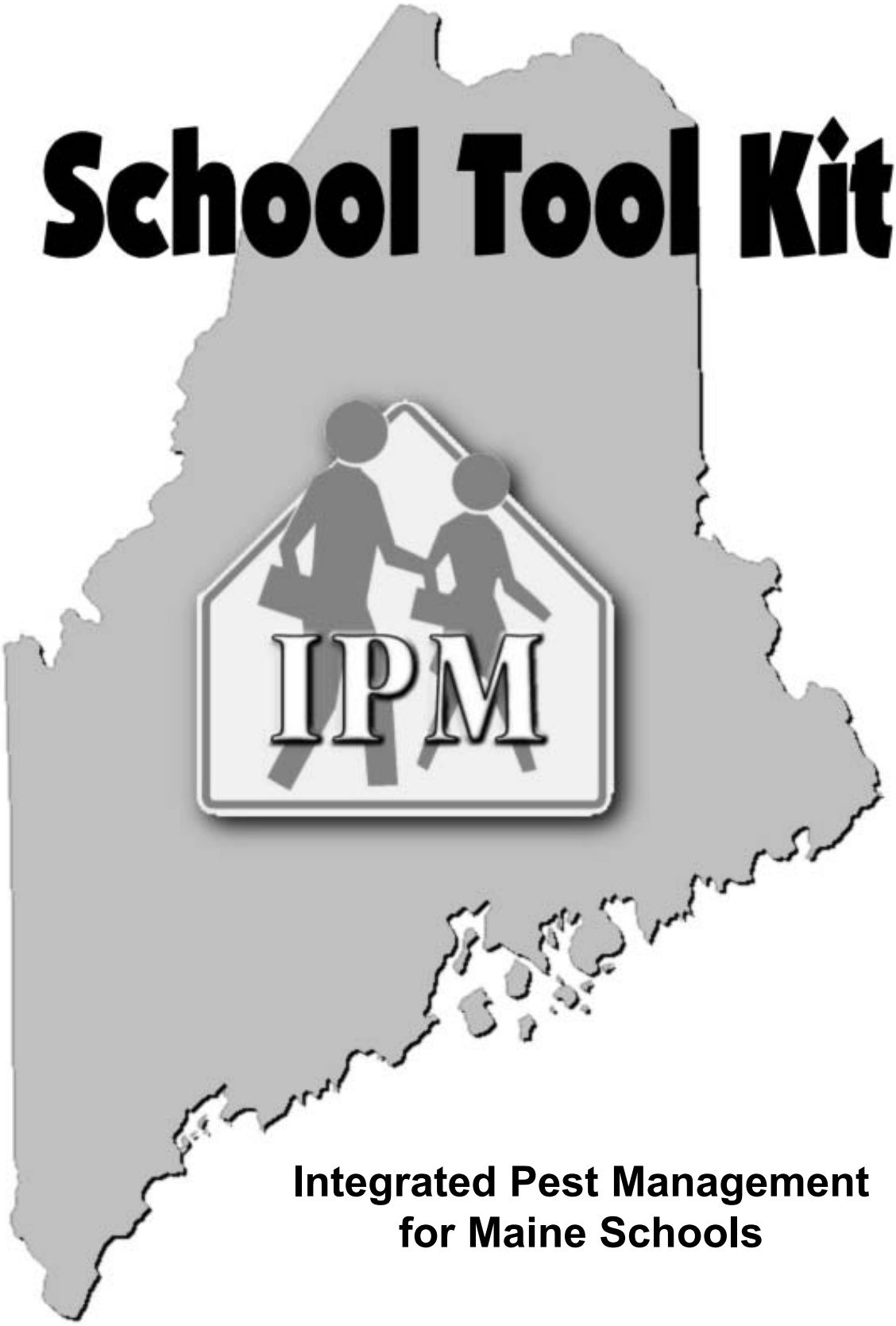
School Tool Kit



Integrated Pest Management for Maine Schools

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The Maine School IPM Program

www.thinkfirstspraylast.org/schoolipm
207-287-2731

All Maine schools, both public schools and private schools, are now required to adopt integrated pest management (IPM) practices and appoint an IPM coordinator. School IPM is an effective and environmentally sensitive approach to pest management that relies on common sense practices and shared responsibilities. The goal of School IPM is to protect students, staff, and visitors from harmful exposure to pests, diseases, or harmful chemicals.

Pesticide use is strictly regulated in Maine schools. IPM will help schools manage pests through regular pest monitoring, effective communication, good facilities management practices, and the use of low-risk pest control.

To facilitate IPM, schools are encouraged to form an IPM advisory committee to guide your schools in developing and maintaining a strong IPM program - using materials in this kit - customized to fit your schools' specific needs. Your IPM coordinator is responsible for the day-to-day operation of the IPM program. This tool kit provides checklists, factsheets, sample letters, and resources to enable you to incorporate IPM into your schools' current facilities management programs.

For more information

Maine School IPM Program, 207-287-2731
kathy.murray@maine.gov
www.thinkfirstspraylast.org/schoolipm

Maine Board of Pesticides Control, 207-287-2731
pesticides@maine.gov
www.thinkfirstspraylast.org

UMaine Cooperative Extension Pest Management Office
800-287-0279 (Maine only) or 207-581-3880
www.umext.maine.edu/topics/pest.htm

Maine Department of Agriculture, Food and Rural Resources

Maine Board of Pesticides Control

University of Maine Cooperative Extension

Using the Tool Kit

This document was prepared by the Maine Department of Agriculture and the University of Maine Cooperative Extension under a federal grant provided by the United States Environmental Protection Agency. The goal of this School Tool Kit is to assist Maine schools in complying with state IPM and pesticide use regulations. Pests such as stinging insects, rodents, mold, and noxious weeds pose risks to the health and safety of students and staff, but unnecessary use of pesticides also presents risks. This kit provides clear and easily applied guidance to help prevent and solve pest problems promptly, economically, and safely. It recommends practical actions that can be carried out by the school staff with flexibility to meet the specific needs of your school. This program is designed to be easily adapted into normal school staff scheduling and training activities.

Why Follow This Guidance

- This tool kit provides guidance in meeting state requirements for IPM and pesticide use.
- IPM can save money and provide a healthier, better managed school environment.
- School staff, administrators, and even students play critical roles in a successful IPM program. This tool kit is designed with pull-out sections to guide each member of your IPM Team.
- Information in this tool kit will assist you in garnering support from parents, staff, and the community, especially among those concerned about health and environmental risks associated with pesticides and pests.

Why Schools Need to Use Integrated Pest Management

To minimize risks posed by pests and pesticides, a balanced approach that relies on prevention, regular monitoring, and combinations of pest management tactics provides long-term solutions with the least risk. This sensible and systematic approach is termed Integrated Pest Management, or IPM.

The four basic principles of IPM are:

- Pest prevention.
- Systematic monitoring and accurate identification of pests.
- Combinations of pest management tactics--using pesticides only if, when, and where necessary.
- Record-keeping and regular evaluation.

Use This Kit To:

- Start an IPM Program for your school(s).
- Designate pest management roles for school personnel, pest management personnel, and key decision makers.
- Provide support for an existing school IPM program.
- Train IPM team members.

This kit, including checklists and sample forms, can be downloaded at **www.thinkfirstspraylast.org/schoolipm.** Some of the forms are also available in Microsoft Word.

How To Use This Tool-Kit

- Look over the Table of Contents to see how this kit is organized.
- Read the first section for an overview of IPM and tips on getting started, including:
  - Appointing an **IPM Coordinator**. **Note: This is required in Maine.**
  - Establishing an **IPM Committee** or adding IPM responsibilities to an existing one.
  - Developing an **IPM Policy** and presenting it to the school board for adoption. **Note: This is required in Maine.** A formal school IPM policy and a written IPM plan help you to establish priorities, assign responsibilities, and coordinate actions among your team members. If your school already has an IPM policy, review it as part of your annual IPM program evaluation.
  - Developing or updating your school's written **IPM plan** that designates and assigns responsibilities to your school's **IPM team**, including tasks served by any contracted service providers. It may be helpful for key team members to first inspect the entire school facility using the **Annual IPM Checklist** to develop a prioritized list of IPM actions for inclusion in the IPM Plan. IPM can also be readily incorporated into service-learning projects or classroom learning experiences to engage teachers and students in your school's IPM program.
  - Preparing and distributing **Action Packets** to each IPM team member. This packet is designed to provide guidance to each member of your IPM team. In schools, IPM must be a team effort. Successful IPM programs rely largely on good cooperation and timely communication among staff, students, parents, and any contracted service providers. Use this tool kit to assemble customized Action Packets for each of your IPM team members.
  - **Evaluating** the effectiveness of your IPM program. Do this at least annually and modify as necessary.
- Adapt or photocopy the **inspection checklists** and include in the IPM Action Packets. These are specific for custodial and building maintenance staff, grounds keepers, athletic field managers, landscapers, food services staff, school nurse/health coordinator, office staff, teachers, and students.
- Refer to the **fact sheets** as you develop and promote your school IPM policy and plan. School staff may also find them useful as a quick reference. For more information see *Outdoor Integrated Pest Management for Maine Schools* and *Integrated Pest Management for Northeast Schools*. These are available through the Maine School IPM Program (207-287-2731).
- Use the **record keeping and monitoring forms** as they are or as templates for developing your own forms. Accurate record keeping is not only required, but written records of pest monitoring or management actions provide a means for effective communication among staff or between the school and any contracted service providers. Records are also important for planning and prioritizing pest prevention and management activities, enabling the IPM team to track pest problems and mitigation efforts, and in determining the effectiveness of the school IPM plan and policy.
- Use the **planning and notification templates** to guide you as you develop or revise your IPM plan, IPM policy, notification letters, and IPM service contracts if your school hires outside pest management services. Notices posted on bulletin boards or sent home for parents help to inform and engage the school community to provide cooperation and support. There is plenty of help available for schools that are committed to IPM. The **Appendix** lists companies selling IPM supplies, regional IPM experts, IPM publications, state and federal resources, and Cooperative Extension offices and contacts.

What Is IPM?

Integrated pest management, IPM for short, is a decision-making process that combines practical pest management strategies to prevent or control pests in ways that reduce risks to health and the environment. IPM offers practical, affordable, long-term solutions for managing school pest problems in ways that ensure a healthy learning environment. The success of school IPM depends on the involvement of many individuals; students, teachers, school staff, administration, and parents are all participants in the IPM program.

IPM is:

- An effective and environmentally sensitive approach to pest management.
- A program that relies on a combination of common sense practices.
- A management strategy based on communication and education, and supported by a committed school administration.
- A partnership between the school community and qualified pest management professionals.
- An elimination or reduction of the reasons that insects, rodents, and plants become pests.
- The knowledge of when and how to remedy pest problems.
- Prevention of pest entry into school facilities.
- Integration of cultural, mechanical, and lowest-impact chemical controls.

IPM includes:

- Pest prevention—outsmarting pests for long-term solutions.
- Monitoring regularly to detect pests before they become a problem.
- Acting against pests only when necessary.
- Applying pesticides only when all other management methods fail.
- Choosing effective, low-risk pest control materials and precision application methods.
- Making pesticide applications only in areas that are inaccessible to students, faculty, and staff.
- Record-keeping and regular program evaluation and revision.

Examples of IPM Practices:

- Custodians and their managers learn the work habits and conditions that help or hinder pests.
- Grounds managers minimize environmental conditions that attract or support pests.
- Food services staff learn to minimize the availability of food and water to insects and rodents;
- Students and teachers take responsibility for keeping their rooms as clean as possible.
- Keep vegetation, shrubs and wood mulch at least one foot away from structures.
- Fill cracks and crevices in walls, floors and pavement.
- Empty lockers and desks and throughly clean them at least twice yearly.
- Clean food-contaminated dishes, utensils, and surfaces by the end of each day.
- Clean garbage cans and dumpsters regularly.
- Collect litter and dispose of properly at least once a week.
- Apply fertilizers to athletic fields several times during the year, rather than one heavy application.
- Identify the pest or problem before taking action.
- Use spot treatments when pesticides are necessary, not area-wide applications.

Why Use IPM?

IPM is REQUIRED in Maine Schools

All Maine schools are required by law to adopt an IPM policy, appoint an IPM coordinator, use IPM practices, and notify parents and staff before pesticides are used. (See the 'Fact Sheets' section for the full regulation: *Standards for Pesticide Applications and Public Notifications in Schools.)*

IPM Reduces Risk

People vary widely in their sensitivity to chemicals such as pesticides, but children are among the most vulnerable to chemical-exposure risks. Similarly, some people are very sensitive to certain pests, such as stinging insects and poison ivy. In Maine, as elsewhere, schools must balance health risks of uncontrolled pest infestations with those of pesticides to ensure the health and safety of school children, staff, and visitors.

IPM reduces risk. Under IPM, an efficient and low-risk system is in place to prevent pests from becoming problematic. IPM targets troublesome pests and minimizes risks to people and the environment.

IPM Can Save Money

Depending on your school system's current practices, IPM has the potential to save time and money. By taking actions to avoid pest problems and applying pesticides only when necessary, many schools will reduce costs over the long term while providing a healthy school environment.

What You Should Know About Pesticides in Maine Schools

Pesticides include bug sprays, ant cups, weed-killers, 'weed and feed' lawn products, plant disease control products, disinfectants, pool chemicals, repellants, and any other chemical used to kill a living organism. Most schools use pesticides. A survey conducted in 2000 showed that three out of four Maine schools use pesticides (in addition to disinfectants which are used by all schools), and one out of three Maine schools use pesticides regularly (3 or more times/year). The survey report is available at **www.thinkfirstspraylast.org/schoolipm**.

Maine law requires a license to apply any pesticides in schools or on school grounds except for routine cleaning or emergency protection from stinging insects. Our survey showed that pesticides are applied by unlicensed staff in violation of state law in more than half of Maine schools!

IPM provides an excellent way to educate the entire school community about pest prevention and pest management and to prevent unnecessary and unlawful pesticide use.

Starting Your IPM Program

The IPM Team

IPM is a Team Effort

Just like academics and athletics, an effective IPM program relies on teamwork. Administration, staff, students, and the community all play important roles. Contributions by each team member are critical and communication among team members is essential to a successful IPM program. If your school system is small, your team may be able to function well with a small team. A bigger school system needs a more complex system for coordinating and communicating IPM activities among departments and outside contractors. An advisory committee can be helpful for long-range planning and regular evaluation of the IPM program in a large school district. In all schools, however, the key to an effective IPM program is designation of a key staff member to coordinate the program and incorporate IPM activities into the school's policy and administrative and facilities management programs. Adding IPM to the academic curriculum will further enhance the effectiveness and sustainability of your school's IPM program.

Suggested IPM Team

Independent Schools

- IPM coordinator (administrator or knowledgeable staff member)
- Administrator (headmaster or principal if that person is not the IPM coordinator)
- Head custodian
- Head maintenance staff
- Head cook
- Teacher
- School nurse
- Student representative
- Any contracted service providers (including pest control technicians, janitorial service providers, maintenance contractors)

School Departments and Districts

- District IPM coordinator (often this is the facilities director)
- Team leader from each school (such as school principal or head custodian at each school)
- District business official
- District or school nurse
- District maintenance director
- District head custodian
- District sports fields and grounds maintenance director
- District athletic director
- District food service director
- Student representative
- Science or horticulture teacher
- Any contracted service providers
- Technology coordinator (for electronic record-keeping and notification systems)

For the School Administrator

Health and Safety are the Primary Goals of IPM

School administrators are responsible for the health and safety of their school facilities. Students and staff spend a significant part of each day on school property and should not be stung, bitten, or otherwise harmed by pests; nor should they be exposed to pesticides. IPM addresses these concerns but needs administrative leadership and support. As a school administrator you play a critical role in ensuring that your school's IPM program meets mandated requirements, that staff are adequately trained, that contractors provide quality services, and that adequate resources are made available. Although you will probably delegate tasks required for the day-to-day operation of your schools' IPM program, you must be familiar enough with your program to ensure that it meets your schools' needs and complies with state requirements.

Many Maine schools rely entirely on well-trained staff to implement their IPM program. Other schools may choose to augment their IPM program with contracted pest service providers. Either way, the key to IPM is to focus on incorporating IPM tasks into your schools' regular facilities management practices. Incorporating IPM lessons into academic and service-learning programs provides additional opportunities for strengthening the effectiveness and sustainability of your schools' IPM program.

IPM relies on:

- Pest prevention through sanitation and maintenance.
- Systematic monitoring for common pests.
- Effective communication to report and manage pest prevention and pest control needs.
- Combinations of low-risk tactics for managing pest problems when they occur.
- Record keeping and regular program evaluation.

The administrator checklist provides an overview of administrator's responsibilities for establishing and maintaining the school IPM program. An asterisk (*) indicates items mandated by Maine regulations and apply to all Maine schools serving any grade kindergarten through 12. Subsequent chapters provide additional guidance for each member of your schools' IPM team.

IPM Advisory Committee

A school-wide IPM program involves the cooperation of the entire school community. For members of the community to accept their roles in the program, they must understand how IPM benefits the members individually and the community as a whole. Schools often find it useful to establish an IPM Advisory Committee to help support development and provide oversight for the schools' IPM program. The committee can provide valuable input from interested parties in the school community and is typically derived from an existing health and safety, indoor air quality, or facilities management committee. This team can—and probably should—include representatives from the following distinct groups.

Teachers and Support Staff play a strong role in IPM for several reasons. They are often the first to observe pests or pest-prevention needs in classrooms. They are also the primary contact with students and their families. Sanitation, food, pets, and plants can be critical issues for pest prevention in the classroom. IPM is even more effective when it is included as part of the academic curriculum, too.

Maintenance, Custodial, and Grounds-keeping Directors and Staff play key roles in an IPM program. These people are responsible for recognizing and correcting conditions that may lead to pest problems. Examples include water leaks, potential pest entryways, and poor sanitation practices. It is essential that this staff be adequately trained to recognize and prevent pest problems.

Kitchen Staff. Food handling and preparation areas are among the most critical areas for pest management. It is essential that kitchen staff understand the importance of good sanitation and proper food storage and play an active role in implementing the IPM program.

School Nurse. The school nurse should maintain copies of material safety data sheets (MSDS) for all chemicals used on school property and keep a list of any students with asthma or chemical sensitivities. The nurse may also help coordinate notification about the use of chemicals at the school. If head lice are a potential problem, the school nurse should educate parents and staff about preventing their spread.

Administrators and School Board Representatives can provide the resources and authority necessary to implement an IPM Program, including preventive maintenance and repair.

Contract Service Providers, if employed by a school system, can provide much of the expertise required to establish an IPM program. If professional pest managers are contracted, their input to committee decision-making may be very valuable.

Students. Information should be shared with students so they understand their role in IPM such as keeping lockers and desks clean, cleaning up trash and spilled food, and maintaining good personal hygiene. In some schools, students are active participants in the IPM program. Students can also provide important information by reporting the pests they see in the Pest Sighting Log.

Parents. It is important that parents be included and that they be aware of the role that the community plays in the schools' IPM program. Sharing information with parents supports IPM by identifying community concerns and improving pest prevention practices. Including parents on the advisory council can also attract additional resources and expertise to the school.

IPM Advisory Committee Roster

Use this worksheet to record committee member names, contact information, and dates of service on the committee.

Chair Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date
Member Name	Phone	E-mail	Term End Date

Annual IPM plan review will be completed by:_____(date).

The School IPM Coordinator

Role and Function of the IPM Coordinator

The IPM coordinator is a school employee who coordinates and leads the day-to-day IPM activities within the school unit. The coordinator can be any school staff member with good organizational skills and willingness to learn about IPM. The choice for IPM coordinator depends on the organization of your school system. In larger school districts, the IPM coordinator may be a district-level staff member or administrator, such as the facilities manager, the head custodian, the business manager, or a health and safety officer. In smaller school systems and individual schools, the IPM coordinator may be a custodian, the principal, the school nurse, a teacher, or other school staff.

A successful program depends on having someone who can manage the team and who is empowered to take action. This includes authority to interact with district-level administration, school staff, students, and parents, and to make budget recommendations. Note the IPM coordinator does not have to be a pest management expert; support is available from a variety of sources (see Appendix).

The coordinator may be responsible for most of the day-to-day program operation or may simply coordinate others who share those responsibilities. However, it is essential that the coordinator ensures that all necessary information is communicated and that all necessary activities are completed in a timely manner. The IPM program will fail if no one takes responsibility, but it also requires the support and cooperation of administration and the other school staff.

Functions of the IPM Coordinator

Most of the daily IPM routine is shared among program participants who are organized into the IPM Team. The IPM coordinator is a team manager and leader. Team members address specific portions of the IPM plan. For example, administrative staff might copy and disseminate the Action Packets and notification letters or summarize data from inspection sheets, a custodian is trained to inspect for indoor pests, groundskeepers monitor athletic fields, the school nurse maintains MSD sheets, etc. The individual and team responsibilities are determined by the IPM Advisory Committee. The coordinator ensures all tasks remain on track. The primary responsibilities of the IPM coordinator are:

Leadership

The IPM coordinator leads an "IPM Team" comprised of all school staff members with IPM responsibilities. The coordinator encourages a sense of shared responsibility and cooperation among team members, provides team members with the IPM Action Packets to direct their activites, and coordinates implementation of the IPM plan.

Emergency Response

Whether it is pest or pesticide related, the IPM coordinator is prepared to take appropriate measures in emergency situations. This individual determines if and when outside professional assistance is needed and coordinates pest management actions.

Key Authority

The IPM Coordinator disseminates IPM information, handles pest complaints, and communicates IPM issues and status to school administration, staff, students, parents, and the press.

Start-Up Hints

In addition to the checklists and factsheets included in School Tool Kit, there is other information you should gather to make starting an IPM program easier:

- Get a map or blueprint of the school.
- Count the number of staff and their job category. You will need this information to distribute checklists, etc.
- Obtain the names and contact information for any outside contractors the school uses, such as vending machine suppliers, trash disposal, building maintenance, or pest control professionals.
- Set up a filing system for all the paperwork you will generate. Keep it in a convenient location.
- Set up a location for turning in checklists.
- Set up an IPM area at your school where staff members can access information at their leisure. This is also a great place to post important reminders and communicate with your staff when something comes up.

Remember, implementing an IPM program is an on-going process, not an overnight miracle. Be patient. Stay consistent, be organized, and never forget that you are doing something important for the staff and students at your school.

IPM coordinators coordinate an "IPM Team" comprised of all school staff members with IPM responsibilities.

Team Member Action Kits

Action Kits provide specific guidance customized for each member of your IPM Team. You select which of the Tool Kit's report forms, checklists, and information to include in each Team Member Action Kit to assist them in meeting their responsibilities as outlined in the IPM plan. For instance, if custodial staff clean the floors and floor drains in the kitchen put the Food Services Checklist into the appropriate custodian's Action Kit, circling items that are the responsibility of the custodian, or marking out those that are not included in that person's responsibilities. Similarly, if it is the head cook's responsibility to check pest monitoring traps in the kitchen and pantry, add the 'Trap and Bait Monitoring Form' to that person's Action Kit. Each team member should receive a customized Action Kit containing the information, checklists, and report forms necessary to fulfill their responsibilities to the schools' IPM program.

To assemble an Action Kit individualized for each member of your IPM team photocopy pages from this tool kit or customize downloadable forms from the website (www.thinkfirstspraylast.org/schoolipm) and add your schools' own forms and documents.

Every Action Kit should contain the following:

- **Introduction to IPM.** A simple introduction provides a summary of important issues regarding IPM: what it is, why it is important, basic problems and control methods, the team approach, and communications.
- **Your Schools' IPM Policy.** The policy describes the reasons for implementing an IPM program, outlines the objectives of the IPM program, emphasizes the importance of IPM, and provides incentive to school staff to actively implement appropriate IPM procedures. A sample school IPM policy is provided in the Appendix.
- **Your Schools' IPM Plan.** The IPM plan is a detailed description of *how* IPM will be used to meet each of the school's pest management goals. Individual responsibilities are noted with associated timelines. An IPM Plan Worksheet and sample plan are found in the Appendix.

Select the appropriate checklists, forms, and fact sheets, found in the next three sections of this tool kit, for inclusion in each Action Kit.

- **IPM Checklists.** Select the appropriate checklists that best decribe the team member's responsibilities or mix and match. The checklists provide easily performed but detailed activities for each participating staff member. These activities are based on the specific functions of each staff member as detailed in the IPM plan.
- **Record-keeping and Monitoring Forms.** These forms may be modified for specific pest situations and used in conjunction wih the IPM checklists. Select one or more of the forms for each Team Member Action Kit as needed.
- **IPM Fact Sheets.** These fact sheets outline IPM methods to reduce the incidence of the more common pests in our schools. Much more information is readily available from sources listed in the Appendix.

School IPM Checklists

Starting Your IPM Program: Administrator Checklist 17

IPM Advisory Committee Checklist 19

IPM Coordinator Checklist 21

Monitoring and Record Keeping Checklist 23

Annual IPM Inspection Checklist 25
Use this to guide annual inspections of the entire school facility and to identify and prioritize pest preventive sanitation and maintenance needs to be addressed in the IPM plan.

Program Evaluation Checklist 35

The following checklists are for staff with specific IPM responsibilities. These can be modified as necessary and included in IPM Action Kits.

Custodial and Building Maintenance Staff Checklist 37

Grounds Managers, Landscapers Checklist 45

Turf Managers Checklist 49

Food Services Staff Checklist 51

Office Staff, Teachers, and Students Checklist 57

School Nurse/Health Coordinator Checklist 61

Starting Your IPM Program: Administrator Checklist

The checklist below and on the following page outline some basic steps for starting your school's IPM Program. Items marked by an asterisk (*) are required by state regulations applicable to all Maine schools. Additional guidance for each team member can be found in the following chapters.

- ❑ *Review state regulations applicable to school IPM, pesticides, and other chemicals.
- ❑ *Appoint a school employee as IPM coordinator to provide day-to-day oversight of the program.
- ❑ *Develop an official IPM policy. A sample policy statement is provided in the Appendix.
- ❑ Establish an IPM Advisory Committee to provide guidance; seek input from staff, students, and the community; and regularly review and provide input for revisions of the written IPM plan as necessary.
- ❑ Conduct a thorough inspection of school buildings and grounds to assess needs for building and grounds pest prevention maintenance and sanitation, pest monitoring, and pest management needs (see Annual Inspection Checklist).
- ❑ Identify key IPM team members, assign responsibilities, and establish protocols for timely and effective communication between administration, staff, and contracted service providers (if any) in the written IPM plan.
- ❑ Develop a written IPM plan that establishes protocols for pest prevention, pest monitoring, IPM implementation, record-keeping, and evaluation. Include specific goals, timelines, and responsibilities.
- ❑ Distribute IPM Action Packets to appropriate staff.
- ❑ Provide adequate staff training (check www.thinkfirstspraylast.org/schoolipm for workshop announcements and training materials).
- ❑ Provide regular IPM and hazardous substances training opportunities for the staff.
- ❑ Verify that staff who apply pesticides are trained and certified applicators.
- ❑ Encourage teachers to incorporate school pest control and IPM information into curricula and class projects.
- ❑ Budget for timely building and grounds maintenance, pest prevention and pest management needs.
- ❑ Regularly evaluate all aspects of the IPM program; modify as needed.
- ❑ Find ways for students to participate in the school's IPM program, if nothing more than to regularly clean leftover food from their lockers and pick up trash.

- ❑ Establish written requirements, including bid specifications, for contractors who apply pesticides.

IPM Advisory Committee Checklist

Use this checklist to provide guidance for advisory committee responsibilites. Check those items for which the committee will be responsible and cross out, modify, or add other responsibilities.

- ❑ Review the schools' IPM policy, or if necessary, work with administration to develop the policy.
- ❑ Provide guidance in interpreting the IPM policy.
- ❑ Assist IPM coordinator in exploring possible alternative pest management practices and products.
- ❑ Provide leadership, guidance, or input for development of the written IPM plan. The IPM plan should describe specific implementation goals, timelines, and responsibilities for pest monitoring, pest prevention, and non-chemical and least-hazardous pest management methods.
- ❑ Establish procedures for notifying parents and staff prior to pesticide applications.
- ❑ Establish procedures for posting pesticide-treated areas.
- ❑ Establish protocols and facilitate communication among program participants.
- ❑ Annually review the written IPM plan and the operational IPM program to evaluate their effectiveness in meeting the schools' objectives. Identify weaknesses in the plan and operational program. Provide leadership, guidance, or input for revising the IPM plan and operational program as needed.
- ❑ Work with administration to assist in annual review of staff training time tables to ensure that staff receive appropriate training.
- ❑ Provide guidance for actively engaging students in learning about IPM or contributing to the IPM program as a service-learning project.

IPM Coordinator Checklist

Items marked by an asterisk (*) are required by state regulations applicable to all Maine schools

- ❑ *Review your schools' IPM policy. If none has been adopted, work with administration, the IPM Advisory Committee, and the school board to adopt an IPM policy as required in Maine (see Planning and Notification Templates chapter for a sample IPM policy or obtain one from Maine School Management Association).
- ❑ *Within two weeks of the start of every school year, notify parents and staff about your schools' IPM policy. The notice must state that pesticides may be periodically applied, where pesticide applications records may be viewed, where the copies of the IPM policy and Chapter 27 (Maine Standards for Pesticide Applications and Public Notification in Schools) may be obtained, the name of the IPM coordinator, and how parents and staff will be notified in advance of pesticide applications. Identify IPM resources, including professional pest control operators with successful track records, state, and university personnel involved with pest management, and print or web-based resources. (See Planning and Notification Templates chapter for sample initial notification letter.)
- ❑ *Notify parents and staff five days before planned pesticide applications. (See Planning and Notification Templates chapter for sample specific pesticide application notice.)
- ❑ *Post notices at the points of access to areas to be treated with pesticides at least two working days before and 48 hours after planned pesticide applications. (See Planning and Notification Templates chapter for sample signs.)
- ❑ *Keep records of the quantity and identification of pests sighted or detected in pest monitoring program and actions taken to manage pests and prevent re-infestation for at least two years. Records must be made available for review by the public and Maine Board of Pesticides Control inspectors. An IPM logbook placed in each school is a good way to keep all required pest monitoring and pesticide application information together in a central location. (See Record Keeping and Monitoriing Forms chapter for sample forms and information to include in logbook.)
- ❑ *Keep pesticide application records, copies of product labels and material safety data sheets (MSDS) of any pesticides applied, the IPM policy, IPM site plans, and pest monitoring/pest sighting records for at least two years, and make this material available to the public and Maine Board of Pesticides Control inspectors when requested.
- ❑ *Ensure that pesticides are only applied in compliance with the school's IPM policy and state regulations.
- ❑ *Ensure that pesticide applications and re-entry intervals do not conflict with school or community activities.

- ❑ Review written IPM plan, or if it is lacking, work with administration and IPM advisory committee (if school has one) to develop one. The written IPM plan should describe procedures for monitoring, preventing, managing, and reporting pests and pesticide use. (See Planning and Notification Templates chapter for sample IPM plan.)
- ❑ With facilities staff and advisory committee, explore possible alternative pest management products and practices.
- ❑ Assign responsibilities identified in the IPM plan and the IPM policy (with support from appropriate administration and/or IPM advisory committee) to school staff and any contracted service providers.
- ❑ Work with administrators and the IPM advisory committee to review and revise, if necessary, contracts for pest management services, if any, to ensure services are provided within the framework of the IPM plan and IPM policy. (See Planning and Notification Templates chapter for sample IPM contract.)
- ❑ Prepare and distribute IPM Action Packets to appropriate staff and apply the strategies proposed in the IPM plan.
- ❑ Coordinate and approve all pest monitoring, prevention, and management activities including the method, material, timing, and location of any pesticide applications.
- ❑ Ensure that contractors, staff, and students receive timely and accurate communication about pests, pest management actions, and record keeping.
- ❑ Ensure that staff and students receive appropriate training and/or instruction needed to implement IPM.
- ❑ Thoroughly inspect school buildings and grounds at least annually to determine the nature and extent of pest problems and contributing factors.
- ❑ Maintain a prioritized list of structural and landscape improvements needed for pest prevention and management and ensure that necessary work is completed in timely manner.
- ❑ Prepare for emergency response to pest threats or pesticide hazards.
- ❑ Evaluate all aspects the IPM program annually to determine if management objectives are being met. Work with the IPM advisory committee to modify as appropriate.
- ❑ Implement an indoor air quality (IAQ) prevention and monitoring program. Obtain free 'Tools for Schools' IAQ kit at www.epa.gov/schools/tools4s2.html or 1-800-438-4318 (ask for EPA document # 402-K-95-001).

School IPM Checklist

Monitoring and Record-Keeping Checklist

Monitoring involves regularly inspecting school buildings and grounds for pests, the damage they cause, and conditions that favor their presence. Monitoring may be done by school staff or a contracted pest management company. Use a standardized method of monitoring for each location; record all observations and keep them in the school's logbook or return them to the IPM coordinator. Keep a record or map showing the location of each trap and bait station on school property (see the Appendix for examples).

Accurate record keeping allows a realistic evaluation of the IPM program. Records also help in forecasting when seasonal pests may appear. The IPM coordinator must ensure that monitoring records are up-to-date and accessible and must keep a log of pest management activities, including all pesticide treatments for at least two years. Most schools keep one set of records in an IPM logbook at the school and keep a duplicate set of records in the IPM coordinators's office. Maine schools are required by state regulations to keep all pest monitoring logs, pesticide application records, and pesticide labels and MSDSs, and to make these available upon request for two years.

Inspection of specific areas where pests have been reported should answer these questions:

- How are the pests getting in? Can this access be reduced or eliminated?
- What food or other resource attracted the pests? Can this source be reduced or eliminated?
- Where exactly are the pests living? Can these sites be altered or removed to reduce pest problems?

Traps can help you to monitor and control pests between inspections. **Sticky traps** are the most common monitoring tools. These glue-covered traps are mostly used to trap crawling insects and small rodents. **Mechanical traps** can be used to monitor and control rodents. **Pheromone traps** are valuable tools for monitoring certain pests, particularly stored product pests. Pheromones are the natural scents insects use to communicate with each other. Certain pests are strongly attracted to the traps, providing an extremely effective early warning system.

Daily monitoring: If a rodent or cockroach infestation is detected, the infested area must be inspected and traps serviced daily until infestation is eliminated.

Monthly flashlight inspections of kitchen areas, behind and under appliances, sinks, soda machines, storage facilities, and similar areas may be needed to locate rodents, cockroaches, silverfish, ants, and other pests.

Monthly inspection of athletic fields, turf, and ornamental plants may be sufficient. If previous records show a pattern of pest problems, inspections may be adjusted to weekly as needed.

Seasonal inspections are helpful in alerting staff to certain problems. In spring, birds may attempt to nest in building corners or openings and wasps begin nest building. In the fall, school buildings may be invaded by species looking for winter sites, including rodents, cluster flies, western conifer seed bugs, multicolored Asian lady beetles, and wasps.

Use the following checklists to develop your own monitoring program. Detailed record keeping and monitoring forms are provided in the Record Keeping and Monitoring Forms chapter. These may be modified to suit individual needs.

Yes	No	
❑	❑	School buildings and grounds are monitored at least monthly for pests and pest-prevention needs.
❑	❑	School kitchen(s) and cafeteria(s) are monitored at least monthly for pests and pest-prevention needs.
❑	❑	Pest monitoring records are up to date and kept available for review for two years in the school's IPM logbook.
❑	❑	The IPM coordinator regularly examines monitoring records and takes appropriate management actions promptly.
❑	❑	Staff and students know how to use the Pest Sighting Log to record any pest sightings or pest-prevention needs.
❑	❑	Follow-up records of pest management or prevention actions taken in response to pest sightings are recorded in the logbook.
❑	❑	A record of all pesticide applications made on school property is kept current and available for review in the school's IPM logbook for two years.
❑	❑	Product labels and MSDSs for all pesticides applied on/in school grounds or buildings are kept in the school's IPM logbook.
❑	❑	Athletic fields are monitored weekly during the growing season for insects, weeds, and diseases.
❑	❑	Lawns, gardens, shrubs, and trees are monitored at least monthly for insects, weeds, diseases, or other growth problems.
❑	❑	Paved areas are inspected regularly for weeds during the wamer months.

Action needed: **Completed (Date/Initials)**

School IPM Checklist

Annual IPM Inspection Checklist

Modified from IPM Standards for Schools, IPM Institute of North America.

The IPM coordinator, along with the facilities manager, head custodian, or other appropriate personnel, should use the following checklist to conduct an annual inspection of the entire school facilities to identify pest prevention and pest management needs and to evaluate the effectiveness of your IPM program. Frequent and thorough inspections allow you to get the jump on newly arrived pests before they become a serious problem.

- Schedule big blocks of time to complete the entire checklist. Plan on spending more time in pest prone areas such as cafeterias and snack rooms, food storage areas, staff lounges, home economics rooms, classrooms or labs with live animals, art rooms, locker rooms, recycling collection points, and loading docks.
- Look for evidence of active pest problems and to identify and prioritize actions needed for pest prevention.
- Use the list of needs generated to develop task lists as part of the IPM Action Kits you assemble for your IPM team members.
- Each team member can then use their own checklists to inspect their areas of responsibility at least monthly to keep the school facilities clean, dry, pest-free, and in excellent repair. (Checklists specific to various staff responsibilties or locations in the school are found in the following pages.)
- Install pest monitoring devices such as rodent and insect traps and service them regularly, at least monthly, but more often when an active rodent problem is detected. (See Monitoring and Record-Keeping Checklist in this manual for tips on using traps to monitor pests.)
- Conduct this thorough 'entire-facilities' inspection at least annually.

Conducting the inspection

- Photocopy this checklist and put it on a clipboard. Obtain or create a floorplan of the school showing all rooms and points of entry.
- Use a bright flashlight and a magnifying glass (hand lens) during your inspection.
- Look, listen and smell for the pests and signs of pests such as droppings, gnawing, tracks, grease marks (indicating rodent runways), odors, nests, and shed insect skins.
- Examine window sills and ceiling light fixtures as many pests fly or crawl towards light.
- Record items needing to be addressed (usually indicated by a 'No' response in the checklist). Cross out any items that do not apply to your school's situation.
- Mark on your floorplan map areas where pest management, prevention, and monitoring actions (including locations of pest traps used for monitoring and control) are needed.
- Develop a prioritized list of actions needed based on the inspection.
- Generate work orders for repairs.
- Assign responsibilities for actions to appropriate staff or contracted service providers.
- Follow-up to ensure necessary actions were taken and were effective. Make changes as needed.

School IPM Checklist

Annual Inspection Checklist

Name:_____

Room/Area:_____

School:_____

Date Completed:_____

Signature: _____

Instructions

1. Read the instructions on the preceding page.
2. Check the appropriate "Yes" or "No" boxes.
3. Write any items needing attention (usu ally indicated by a 'No' response) in the places provided at the end of each section. Record date and initials to show when those items have been corrected.
4. IPM coordinator and facilities manager or custodian: keep copies of completed records for at least two years.

Kitchen and Cafeteria

Yes	No	
❑	❑	Cracks and crevices in walls and floors and around permanent fixtures are sealed.
❑	❑	Openings around electrical conduits, pipe chases, and ducts are sealed or covered with escutcheon plates.
❑	❑	Floor drains are covered with screens.
❑	❑	Floor drains are cleaned regularly with a long-handled brush and cleaning solution.
❑	❑	Floor drain traps are kept full of water.
❑	❑	Plumbing is kept in good repair (no dripping pipes, faucets, or plugged drains)
❑	❑	Sewer lines are in good repair.
❑	❑	All surfaces, trays, and dishes are cleaned and dry by the end of the day.
❑	❑	All surfaces in food preparation and serving areas are regularly cleaned of grease deposits.
❑	❑	Wiping cloths are disposable or laundered daily.
❑	❑	Mops and mop buckets are properly dried and stored (mops upsidedown, buckets emptied).
❑	❑	Overflow water trays in refrigeration units are cleaned and emptied as often as necessary to prevent water leaks.
❑	❑	Areas around and under appliances and furnishings that are rarely moved (e.g., refrigerators, freezers, shelving units) are thoroughly cleaned to remove accumulated grease, dust, etc., at least monthly.
❑	❑	Purchases of new kitchen appliances and fixtures are of pest-resistant design (i.e., open design, few or no hiding places for roaches, freestanding and on casters for easy thorough cleaning).

Kitchen and Cafeteria (cont.)

Yes	No	
❑	❑	Out-of-date charts or paper notices are removed from walls monthly.
❑	❑	Vending machines are maintained in clean condition inside and out.
❑	❑	Recyclable containers are washed with soapy water before storage or stored refrigerated or in pest-proof containers and regularly moved off-site.
❑	❑	Food waste from preparation and serving areas is stored in sealed, leakproof plastic bags before removal from school grounds.
❑	❑	Waste with liquid food residues (e.g., milk cartons, juice boxes) are drained of excess moisture before discarding.
❑	❑	Weather stripping and door sweeps are present and in good condition on exterior doors.

Action Needed: **Completed (Date/Initials)**

Food Storage Areas

Yes	No	
❑	❑	Incoming shipments of food products, paper supplies, etc. are inspected for pests and rejected if infested.
❑	❑	Food products delivered in non-pest-proof containers (e.g., paper, cardboard boxes) and not used immediately are stored refrigerated or transferred to pest-proof containers.
❑	❑	Packing and shipping materials (bags, boxes, pallets) are promptly removed from food storage areas and properly disposed of or recycled.
❑	❑	Stored products are rotated on a "first in, first out" basis to reduce potential for pest harborage and reproduction.
❑	❑	Bulk stored products are not permitted direct contact with walls or floors, allowing access for inspection and reducing pest harborages.
❑	❑	Inspection aisles (> 6" x 6") are maintained around bulk stored products.
❑	❑	Food storage areas are inspected twice monthly for evidence of pests.
❑	❑	Food that has come in direct contact with pests (such as ants, mice, cockroaches, mealworms or other stored product pests) is considered contaminated and is discarded promptly.
❑	❑	Shelf paper is not used.
❑	❑	Paper products are stored separately from food products.

Action Needed: **Completed (Date/Initials)**

Classrooms, Offices, Hallways, Teachers' Rooms

Yes	No	
❑	❑	Cracks and crevices in walls and floors are sealed.
❑	❑	Lockers and desks are emptied and cleaned at least twice per year.
❑	❑	Floors are cleaned regularly.
❑	❑	Beverage and food containers kept for recycling are washed before storage or sealed in pest-proof containers and moved off-site regularly.
❑	❑	Food or food wrappers are removed from lockers, desks, and teachers' rooms daily.
❑	❑	Potential pest food items used in classrooms (e.g., beans, plant seeds, pet food and bedding, decorative corn, gourds) are refrigerated or stored in glass or metal containers with pest-proof lids.
❑	❑	Refrigerators, microwave ovens, and vending machines are clean inside and out.
❑	❑	Sink areas are kept clean and dry.
❑	❑	Food and beverages are allowed only in limited designated areas that are cleaned daily.
❑	❑	Materials are stored away from walls to allow for regular pest inspection.
❑	❑	Waste materials in all rooms within the school building are collected and removed to a dumpster, compactor, or designated pickup location daily.
❑	❑	Animal wastes from classroom pets or laboratory animals are flushed or placed in sealed containers before disposal.
❑	❑	Moisture problems and damage are promptly reported and corrected .
❑	❑	Mark 'Yes' if there is no evidence of pests in room, under sink, in closets and cabinets, on windows or sills (no rodent droppings, gnawed food packages, mouse holes, odors, mold, insects, plants unhealthy-looking or sticky). Mark 'No' if any pest evidence is found.
❑	❑	Furniture rarely moved (e.g., staff desks, bookcases, filing cabinets) is thoroughly cleaned on, around, and under at least annually.
❑	❑	New furniture purchases are on wheels or castors to permit them to be easily moved.
❑	❑	New stuffed chairs or couches are inspected for bed bugs and other pests before they are brought into the school.

Action Needed: **Completed (Date/Initials)**

Classrooms, Offices, Hallways, Teachers' Rooms (cont.)

Actions Needed: **Completed (Date/Initials)**

Restrooms

Yes	No	
❑	❑	Rooms are cleaned and trash is removed daily.
❑	❑	Drain covers are removed and drains are regularly cleaned with a long-handled brush and cleaning solution.
❑	❑	Cracks and crevices in walls and floors and behind fixtures are sealed or caulked.
❑	❑	Plumbing is in good repair (no leaks, drips, clogged drains).
❑	❑	Escutcheon plates are in place and sealed around pipe holes.

Action Needed: **Completed (Date/Initials)**

Custodial and Maintenance Areas/Duties

Yes	No	
❑	❑	Tasks requiring cleaning are clearly distinguished from disinfecting tasks and products used for routine cleaning do not contain disinfectants.
❑	❑	Cleaning and disinfecting products are stored in secure areas inaccessible to children.
❑	❑	Custodial products in aerosol containers are not used except for graffiti-removal products.
❑	❑	Mops and mop buckets are properly dried and stored (e.g., mops hung upside down, buckets emptied).
❑	❑	Trash/recycling rooms, compactors, and dumpsters are regularly inspected; spills are cleaned up; and leaks are repaired promptly.
❑	❑	Indoor garbage is kept in lined, covered, clean containers, and emptied daily.
❑	❑	Packing and shipping waste is disposed of promptly.
❑	❑	Stored waste is collected and moved off site at least once weekly.
❑	❑	Recyclables are rinsed or stored in pest-proof containers and moved off site weekly.
❑	❑	Vent or heater filters are cleaned or replaced as per manufacturer's recommended interval or more frequently.
❑	❑	The inside of vents and ducts are inspected at least every three years and cleaned by a licensed contractor when needed.
❑	❑	Moisture sources are corrected (e.g., ventilate areas where condensation forms frequently, repair plumbing, roof leaks, dripping air conditioners, leaking windows, etc).
❑	❑	Moisture damage is corrected (replace water-damaged ceiling tiles, dry or replace water-soaked carpeting, repair and replace water-damaged wood, etc.)

Action Needed: **Completed (Date/Initials)**

Outdoors

Yes	No	
❑	❑	Tree limbs are at least 6 ft (10 feet if tree squirrels are a problem) away from building.
❑	❑	Vegetation, shrubs, and bark mulch are kept back more than 12 inches from building.
❑	❑	Exterior doors are kept shut when not in use.
❑	❑	Windows and vents are screened or filtered and screens are in good condition.
❑	❑	Weather stripping and door sweeps are present and in good condition on exterior doors.
❑	❑	Building eaves, walls, gutters, and roofs are sound. No evidence of water leaks or holes.
❑	❑	Cracks in foundation or walls and openings around conduit, plumbing, and doorways are sealed.
❑	❑	Garbage containers, compactors, and garbage storage are placed at least 50 feet away from building entrances.
❑	❑	Trash cans are placed away from doors of building, emptied daily, lined with plastic bags, and fitted with tight-fitting lids with spring-loaded doors.
❑	❑	Dumpsters are placed on a hard, cleanable surface.
❑	❑	Dumpsters are emptied weekly and cleaned regularly.
❑	❑	Dumpsters have close-fitting lids that are kept closed.
❑	❑	Openings to hollow spaces in structures, playground equipment, fencing, utility boxes, and other places prone to nest-building by stinging insects, are sealed before warm weather arrives to prevent stinging insects from building nests in areas of human activity. (See 'Bees, Wasps and Yellowjackets Fact Sheet' in this kit.)
❑	❑	Building exteriors, playground structures, fencing, electrical boxes, sheds, concession stands, and other outdoor structures are inspected twice monthly during warm months for stinging insect activity and nests.
❑	❑	Stinging insect nests located in or near areas of human activity are destroyed in a safe and legal manner.
❑	❑	Additional appropriate corrective actions (such as ensuring that dumpster is clean, emptied often, and in good repair) is taken early in the season to prevent build-up of stinging insect populations.

Action Needed: **Completed (Date/Initials)**

Pest and Pesticide Management

Yes	No	
❑	❑	Pesticides (including 'weed and feed' products, mold and mildew control products, disinfectants, rodent baits, ant baits, insecticides, plant disease control products, weed-killers and any other substance or mixture intended to kill living organisms) are never applied in or on school grounds except by persons licensed in the appropriate category by the Maine Board of Pesticides Control, except when used for routine cleaning or for emergency protection from stinging insects.
❑	❑	No pesticides are applied for pests causing aesthetic damage only.
❑	❑	All parents, staff and students are notified within the first two weeks of school about the school's official IPM policy and how to contact the school's IPM coordinator.
❑	❑	Notification and posting is conducted in advance of pesticide use when required.
❑	❑	Pest monitoring, pest sighting logs, and pest prevention and management records are kept up-to-date, maintained in the school in an accessible location, and can be made available upon request.
❑	❑	At the beginning of each year, all staff and students are instructed in approved pest prevention, management, and pest reporting procedures.
❑	❑	Lesser risk options for pest management, especially non-pesticide options, are used first when action is required.
❑	❑	Each trap or other device used for monitoring and/or trapping pests is assigned an identification number and maps showing the location of each device are included in the IPM logbook.
❑	❑	Pest devices containing pesticides, such as rodent bait stations or ant bait cups, are each marked with appropriate warning language.
❑	❑	Pest traps and bait stations are checked at least monthly.
❑	❑	Rodent traps are checked and emptied daily.
❑	❑	All pesticides (including disinfectants) are properly stored in original containers in secured locations according to appropriate hazardous chemical safety protocol (e.g. flammables stored in fire-resistant cabinet, acids stored separately from bases, chlorine-containing chemicals not stored near acids or ammonia).
❑	❑	Labels and material safety data sheets (MSDSs) for each pesticide and other hazardous chemical are maintained in an accessible location.
❑	❑	Pesticides (including disinfectants) inventory is managed to track current stock use and to ensure proper disposal of unused materials and empty containers.
❑	❑	Personal protective equipment (PPE) required for application of disinfectants, stinging insect sprays, or other pesticides is provided for and worn by all applicators.
❑	❑	Pesticides are only applied when there are no unprotected people in the area.

Action Needed: **Completed (Date/Initials)**

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Pest and Pesticide Management (cont.)

Action Needed:	**Completed (Date/Initials)**

School IPM Checklist

Program Evaluation Checklist

IPM programs require a periodic review of inspection and monitoring reports, the logbook, and other records to see how the program is working, and identify any changes that are necessary. A new IPM program should be evaluated every three months. Established programs are evaluated at least once per year. A summary report is prepared, usually by the IPM coordinator, and submitted to the IPM Advisory Committee, noting the current conditions, common pests, known problems, and recommendations for improvement.

Evaluation Checklist

YES	NO	
❑	❑	All pest populations are below action thresholds.
❑	❑	All objectives in the pest management plan have been achieved.
❑	❑	The monitoring program is adequate.
❑	❑	Pest and pesticide exposure risks are minimized. Additional alternative pest management practices are not needed.
❑	❑	Time and effort expended are appropriate. There are no further efficiencies needed.
❑	❑	Problems have been identified.
❑	❑	Necessary changes have been identified.
❑	❑	The appropriate personnel have been contacted to carry out these changes.
❑	❑	The IPM coordinator summarizes pest management activities for the year and submits a report to the IPM Advisory Committee.

Action needed: **Completed (Date/Initials)**

School IPM Checklist

Custodial and Building Maintenance Staff

❑ **Need help with pest control**

Name:_____

Room/Area:_____

School:_____

Date Completed:_____

Signature: _____

Instruction

1. Read the information on this sheet.
2. Check the appropriate "Yes" or "No" boxes.
3. Write any items needing attention (usually indicated by a 'No' response) in the places provided at the end of each section and check the 'Need help' box above. Record date and initials to show when problems have been corrected.
4. Return completed checklist to the IPM coordinator; keep a copy for your records.

It is the policy of this school district to manage pest problems in ways that pose the least hazard to human health and the environment. We have adopted an integrated pest management (IPM) program. IPM combines pest prevention, systematic monitoring of potential pests, non-chemical pest control methods, and if warranted, appropriate use of pesticides that are the least harmful to human health and the environment. By addressing and correcting the root causes of pest problems, IPM can provide long-term, economical pest control and provide a healthy environment for learning and working.

We are asking for your cooperation with our IPM program! The success of IPM depends primarily on keeping our school clean, dry, and well-maintained and everyone, especially custodial staff, are essential participants. Together we can help reduce pest problems and pesticide applications. You can have a positive impact on our goal to reduce pest problems by completing the following checklist as indicated by your IPM coordinator.

General

Yes	No	
❑	❑	Tasks requiring cleaning are clearly distinguished from disinfecting tasks and products used for routine cleaning do not contain disinfectants.
❑	❑	Cleaning and disinfecting products are stored in secure areas inaccessible to children.
❑	❑	Custodial products in aerosol containers are not used except for graffiti-removal products.
❑	❑	Mops and buckets are properly dried and stored (e.g. mops hung upside down, buckets emptied).

Action needed: **Completed (Date/Initials)**

General (cont.)

Action needed: **Completed (Date/Initials)**

Restrooms

Yes	No	
❑	❑	Cracks and crevices in walls and floors and behind fixtures are sealed or caulked.
❑	❑	Drain covers are removed and drains are cleaned regularly with a long-handled brush and cleaning solution.
❑	❑	Rooms are cleaned and trash is removed daily.
❑	❑	Plumbing is in good repair (no leaks, drips, clogged drains).
❑	❑	Escutcheon plates are in place and sealed around pipe holes.

Action needed: **Completed (Date/Initials)**

Classrooms, Hallways, Office Areas

Yes	No	
❑	❑	Floors are cleaned regularly.
❑	❑	Cracks and crevices in walls and floors are sealed or caulked.
❑	❑	Stored materials are uncluttered and storage areas easy to inspect for pests.
❑	❑	Boxes, paper supplies, and similar materials are not stored in the same areas as food or trash.
❑	❑	Supplies are not stored in boxes for long periods of time. Orders for supplies do not exceed short-term needs.
❑	❑	Areas near doors and windows are kept clear.
❑	❑	Lockers and desks are emptied and cleaned twice per year.
❑	❑	Food is consumed only in designated areas; these areas are kept clean.
❑	❑	Food items are stored in a refrigerator or pest-proof containers.
❑	❑	Sink areas are kept clean and dry.

Action needed: **Completed (Date/Initials)**

Plumbing / Ventilation

Yes	No	
❑	❑	School buildings are regularly inspected for signs of moisture, leaks, or spills.
❑	❑	Drains are cleaned and inspected regularly.
❑	❑	Plumbing is in good repair: no dripping pipes, faucets or other uncontrolled water sources.
❑	❑	Slow or clogged drains, leaking pipes, and dripping faucets are fixed immediately.
❑	❑	Floor and sink traps are kept full of water.
❑	❑	Sewer lines are in good repair.
❑	❑	Pipes that encourage condensation, such as refrigeration units, are insulated.
❑	❑	Hot water pipes are insulated wherever possible, particularly in tight, out-of-the-way places.
❑	❑	Steam leaks are repaired immediately.
❑	❑	Water coolers with overflow basins are emptied and cleaned as frequently as necessary.
❑	❑	Vent or heater filters are cleaned or replaced per manufacturer's recommended interval or more frequently.
❑	❑	The inside of vents and ducts are inspected at least every three years and cleaned by a licensed contractor when needed.

Action needed: **Completed (Date/Initials)**

Building Exteriors

Yes	No	
❑	❑	Building eaves, walls, and roofs are inspected at least quarterly and repaired as needed.
❑	❑	Trees, shrubs, and bark mulch are kept more than one foot away from exterior walls and six feet (10 feet if tree squirrels are a problem) from the roof.
❑	❑	Where possible, low-pressure sodium vapor bulbs are used for exterior lights.
❑	❑	Where possible, lighting is placed away from buildings and trained on the exterior rather than attached directly to the wall.
❑	❑	If lights must be attached to buildings, they are placed as far from doorways and windows as possible, particularly frequently used doorways.
❑	❑	Weather stripping and door sweeps are used to prevent pest entry.
❑	❑	Openings around electrical conduit, plumbing, cracks in foundation, and other potential access sites are sealed.
❑	❑	Building eaves, walls, and rain gutters are in good repair - water drains away from the building.
❑	❑	Windows, screens, and vent covers are kept in good repair.
❑	❑	Exterior doors are kept shut when not in use.
❑	❑	Doors and windows that do not close completely are fixed immediately.
❑	❑	Doors leading outdoors from food service areas are equipped with self-closures or air curtains.
❑	❑	Automatic door closers or air curtains are installed on heavily used doors that tend to be left open, exterior doors, and doors that are near areas where food or trash is present.
❑	❑	Temporary repairs made by pest control contractors are permanently fixed as soon as possible.

Action needed: **Completed (Date/Initials)**

Waste Management

Yes	No	
❑	❑	Outdoor trash receptacles and dumpsters are kept at least 50 feet from building entrances.
❑	❑	Dumpsters and trash with food wastes are located far from areas with dense shrubbery or over growth, or where lumber or other materials are stored.
❑	❑	Areas around dumpsters and trash receptacles are free of food residues, leaves, weeds, and debris that attract and provide harborage to pests.
❑	❑	Dumpsters are placed on well-drained concrete, asphalt, or gravel pads.
❑	❑	Dumpster lids are kept closed. Dumpsters are never filled so high that the lids cannot be shut.
❑	❑	If a dumpster lid is broken, or the dumpster is full, the management company responsible for the waste pickup is contacted immediately.
❑	❑	Outdoor trash cans are not left overnight without a tight fitting lid in place. Preferably these containers are equipped with self-closing, swing-type lids.
❑	❑	Where possible, trash receptacles are elevated off the ground.
❑	❑	Where possible, metal trash receptacles are used or metal disks are installed in the bottoms of plastic cans to prevent animals from chewing through containers.
❑	❑	Indoor garbage is kept in lined, covered containers and emptied daily.
❑	❑	Garbage is not accessible to pests overnight.
❑	❑	Stored trash is in a single area, closed off from the rest of the building, and frequently cleaned.
❑	❑	Stored waste is collected and moved off site at least weekly.
❑	❑	All garbage cans and dumpsters are kept clean and are washed regularly.
❑	❑	Trash/recycling rooms are inspected and cleaned regularly.
❑	❑	Packing and shipping waste is promptly disposed of or moved off-site for recycling.
❑	❑	Indoor trash is emptied late during the day after lunch and afternoon breaks.
❑	❑	Trash can liners are replaced each time the receptacle is emptied.

Action needed: **Completed (Date/Initials)**

Recycling

Yes	No	
❑	❑	Cans, bottles, styrene plates, etc. are washed off thoroughly and excess water is shaken off before placing in recycling bins. If recyclables are not rinsed, they are stored in containers with tight fitting lids that are emptied as often as possible.
❑	❑	Recycling bins are lined with plastic garbage bags. Bags are replaced each time the bin is emptied.
❑	❑	Recycling bins are cleaned as necessary with detergent and hot water.
❑	❑	Trash compactors are opened and cleaned on a regular basis.
❑	❑	Paper and cardboard are stored away from potential sources of food, such as dining areas, recycling bins, vending machines, etc.
❑	❑	Recyclable materials are collected and moved off site at least weekly.

Action needed: **Completed (Date/Initials)**

Wasp IPM

Yes	No	
❑	❑	Between May and October, building exteriors and outdoor equipment are inspected for wasp nesting activity every 2 weeks. Nests located near areas of human activity are destroyed.
❑	❑	All trash containers have tight-fitting lids or spring loaded doors.
❑	❑	All waste is sealed into plastic bags before disposal.
❑	❑	Trash is frequently emptied, especially during warm weather.
❑	❑	Dumpsters are washed on a regular basis to eliminate spilled food and liquids.
❑	❑	Food consumption is limited outdoors. Trash is promptly cleaned up after outdoor events where food was served.
❑	❑	Openings in outside walls, playground structures, fences, pipes, hollow fence posts, meter boxes, wall voids, etc. are sealed to prevent wasps from building nests.
❑	❑	Students and staff promptly report evidence of wasp nests (concentrated wasp activity or visible nests) on school grounds to IPM coordinator.
❑	❑	Staff are trained in appropriate emergency response for stings.

Action needed: **Completed (Date/Initials)**

School IPM Checklist

Grounds Managers, Landscapers

❑ **Need help with pest control**

Name:_____

Room/Area:_____

School:_____

Date Completed:_____

Signature: _____

Instructions

1. Read the information on this sheet.
2. Check the appropriate "Yes" or "No" boxes.
3. Write any items needing attention (usually indicated by a 'No' response) in the places provided at the end of each section and check the 'Need help' box above. Record date and initials to show when problems have been corrected.
4. Return completed checklist to the IPM coordinator; keep a copy for your records.

It is the policy of this school district to manage pest problems in ways that pose the least hazard to human health and the environment. To this end, we have adopted an integrated pest management (IPM) program. IPM combines pest prevention, non-chemical pest control methods, and the appropriate use of pesticides that are the least harmful to human health and the environment. By addressing and correcting the root causes of pest problems, IPM can provide long-term, economical pest control and minimize the risk of pesticide exposure.

We are asking for your cooperation with our IPM program! The success of IPM depends on the involvement of many individuals. Students, teachers, school staff, administration, and parents are all participants in the IPM program. Together we can help reduce pest problems and pesticide applications. You can have a positive impact on our goal to reduce pest problems by completing the following checklist as indicated by your IPM coordinator.

Grounds management staff play key roles in an IPM program. They are responsible for recognizing and correcting conditions that may lead to pest problems. A good management program, that includes as many appropriate actions as possible from the following list, should minimize conditions that attract or support pests while providing safe, healthy, attractive, and functional school grounds. The grounds are so varied that it is impossible to remove all sources of food, water, and shelter for pests, but it is possible to minimize conditions that attract or support them. It is important that all grounds maintenance staff be adequately trained to recognize and prevent pest problems. Refer to the Fact Sheets chapter of this tool kit for additional information on turf and landscape care and tips for weed, insect and plant disease monitoring and prevention practices.

Waste Management

Yes	No	
❑	❑	An adequate number of trash receptacles are in place where people use outdoor benches and dining areas and are likely to leave food debris behind.
❑	❑	Outdoor trash receptacles (preferably metal) have self-closing lids, are kept clean, and are emptied daily.
❑	❑	Trash receptacles with an open design, such as wire mesh, have openings less than 1/4" in diameter.
❑	❑	Trash receptacles are elevated off the ground.
❑	❑	Empty beverage containers are double-rinsed, kept in tightly sealed pest-proof containers, and removed daily.
❑	❑	Food concession buildings (snack shacks) are regularly inspected, kept clean, pest free, well sealed, with all food sealed in pest-proof containers.

Action needed: **Completed (Date/Initials)**

Water Management

Yes	No	
❑	❑	Water does not pool for any period of time anywhere on school grounds.
❑	❑	Gutters and drainpipes are regularly cleaned and in good condition.
❑	❑	Vehicle tires are not used in play areas or have drainage holes that prevent them from collecting water and are inspected regularly for standing water and wasp nests.

Action needed: **Completed (Date/Initials)**

Landscaping

Yes	No	
❑	❑	School grounds are regularly scouted for weeds, insects and diseases.
❑	❑	Bark and wood chips are kept more than 12 inches from building).
❑	❑	Where possible, trees and shrubs are trimmed to have at least 12 inches of clearance between the ground and foliage and more than 12 inches from foliage to bulding.
❑	❑	Climbing vines are removed from exterior walls.
❑	❑	Tree limbs are trimmed to at least 6 feet (10 feet if squirrels are a problem) away from building and roof.
❑	❑	Leaves and other clutter that accumulate along foundations, retaining walls, etc. are removed promptly.
❑	❑	Walls and fencelines are kept free from weeds and debris that might provide pest shelter.
❑	❑	A list of approved plants is developed and maintained for the school.
❑	❑	Plants selected for planting, including gardens and memorial plantings, are appropriate for each site.
❑	❑	Pest and drought resistant plants that are native, or non-invasive alien plants from similar climates, are used for new landscaping.
❑	❑	Plants that shed a minimum of seeds and fruits are used for landscaping.
❑	❑	Fallen seeds and fruit from ornamental plantings are picked up and disposed of promptly.
❑	❑	Soil and pavement directly adjacent to buildings and retaining walls are graded away from buildings. Drainage is adequate to account for roof and pavement runoff, sprinkler systems, down spouts, etc.
❑	❑	Outdoor "bug zappers" are not used.

Action needed: **Completed (Date/Initials)**

School IPM Checklist

Turf Managers

❑ **Need help with pest control**

Name:_____

Room/Area:_____

School:_____

Date Completed:_____

Signature: _____

Instructions

1. Read the information on this sheet.
2. Check the appropriate "Yes" or "No" boxes.
3. Write any items needing attention (usually indicated by a 'No' response) in the places provided at the end of each section and check the 'Need help' box above.
4. Return completed checklist to the IPM coordinator; keep a copy for your records.

It is the policy of this school district to manage pest problems in ways that pose the least hazard to human health and the environment. To this end, we have adopted an integrated pest management (IPM) program. IPM combines pest prevention, non-chemical control methods, and the appropriate use of pesticides. IPM addresses and corrects the root causes of pest problems to provide long-term, economical pest control with a minimum risk of pesticide exposure.

We are asking for your cooperation with our IPM program! The success of IPM involves many individuals. Students, teachers, school staff, administration, and parents all participate in IPM. Together we can help reduce pest problems and pesticide applications. You can help our goal to reduce pest problems by completing the following checklist as indicated by your IPM coordinator. Refer to the Fact Sheets chapter of this tool kit for help in identifying, monitoring, preventing, and managing pests.

Turf Management

Yes	No	
❑	❑	Turf is regularly scouted for weeds, insects, and diseases. Monitoring records are kept in the IPM logbook.
❑	❑	Pests are identified before any control actions are taken. Control actions are recorded in the IPM logbook.
❑	❑	Turf receives 1 inch of water as rain or irrigation per week, or is not used and is allowed to go dormant during summer months.
❑	❑	If irrigation is used, it is applied during early morning hours.
❑	❑	Turf is mowed when the grass is dry and soil is not excessively moist.
❑	❑	Mowing height is set to 2½-3 inches.
❑	❑	Mowing is frequent enough to remove no more than 1/3 of the leaf blade at any one cutting
❑	❑	Mowing blades are kept sharp.
❑	❑	Soil is tested every year, pH is adjusted and fertilizer is added as indicated.
❑	❑	Low maintenance turf is soil tested every 3 years.
❑	❑	Turf is fertilized at least twice each year. Low maintenance turf is fertilized once a year.
❑	❑	High-use turf is aerified at least once each year.
❑	❑	Bare spots and damaged turf are overseeded and top-dressed as necessary.

❑ ❑ Thatch is kept to no more than $^{3}/_{4}$-inch depth.

Action needed: **Completed (Date/Initials)**

School IPM Checklist

Food Services Staff

❑ **Need help with pest control**

Name:_____

Room/Area:_____

School:_____

Date Completed:_____

Signature: _____

Instructions

1. Read the information on this sheet.
2. Check the appropriate "Yes" or "No" boxes.
3. Write any items needing attention (usually indicated by a 'No' response) in the places provided at the end of each section and check the 'Need help' box above.
4. Return completed checklist to the IPM coordinator; keep a copy for your records.

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We are asking for your cooperation with our IPM program! The success of IPM depends on the involvement of many individuals. Students, teachers, school staff, administration, and parents are all participants in the IPM program. Together we can help reduce pest problems and pesticide applications. Do not pressure school staff to apply pesticides; there are other effective means of controlling pest problems. You can have a positive impact on our goal to reduce pest problems by completing the following checklist as indicated by your IPM coordinator.

Food handling and preparation areas are among the most critical areas for pest management. It is essential that kitchen staff practice good sanitation and proper food storage and play an active role in implementing the IPM program.

Inspections and Pest Monitoring

Yes	No	
❑	❑	Insect monitoring traps and glue boards or mouse traps are used to monitor for crawling insects and rodents at least monthly, and checked daily when a rodent infestation is detected.
❑	❑	Incoming shipments of food and supplies are inspected for pests upon delivery and rejected if infested.
❑	❑	Kitchen, food pantry, and cafeteria are inspected for evidence of pests (droppings, webbing, insects, odors, etc.) at least twice per month. Results and appropriate action taken are recorded in a log book and promptly reported to the IPM coordinator.
❑	❑	Pipes, garbage disposal conduits, drain-fittings, ice machines, etc. (including those in out-of-the-way places) are inspected weekly for leaks and repaired promptly.

- ❑ ❑ Water is not left standing in steam tables or sinks when not in use and never overnight.
- ❑ ❑ Openings around electrical conduits, pipe chases, and ducts are sealed or covered with escutcheon plates.
- ❑ ❑ Floor drains are covered with screens.
- ❑ ❑ Drain traps are kept full of water.
- ❑ ❑ Sewer lines are in good repair.
- ❑ ❑ Out-of-date charts or paper notices are removed from walls monthly.

Action needed: **Completed (Date/Initials)**

Cleaning

Yes	No	
❑	❑	All kitchen areas are cleaned thoroughly before end of each day in use.
❑	❑	Pits below dumb waiters are checked and cleaned frequently.
❑	❑	Portable items such as food carts and tray racks are cleaned frequently and kept free of food debris. Steam cleaning is preferable.
❑	❑	All used dishes and utensils are cleaned by the end of the day.
❑	❑	All surfaces are cleaned and dry by the end of the day.
❑	❑	Surfaces in food preparation and serving areas are regularly cleaned of any grease deposits.
❑	❑	Vending machines are maintained in clean condition inside and out.
❑	❑	Wiping cloths, aprons, and other linens are disposable or laundered daily.
❑	❑	Mops and mop buckets are properly dried and stored after each use.
❑	❑	Drain covers are removed and drains are cleaned weekly with a long-handled brush and cleaning solution.
❑	❑	Overflow water trays in refrigeration units are cleaned and emptied regularly.
❑	❑	Areas around and under appliances and furnishings that are rarely moved are thoroughly cleaned at least monthly to remove accumulated grease, dust, etc.

Action needed: **Completed (Date/Initials)**

Waste Management

Yes	No	
❑	❑	Dumpsters have rain covers or lids in good condition and are kept closed to keep rodents out and garbage in.
❑	❑	Dumpsters are never allowed to overflow. The lid can always be fully closed.
❑	❑	Dumpsters are located as far away as practical from building entrances and windows.
❑	❑	Garbage that is not put in dumpsters is placed in lined trashcans. If outdoors, cans have tight fitting lids and are kept closed when not in use.
❑	❑	Garbage cans are cleaned periodically with hot water and detergent.
❑	❑	Food waste is stored in sealed plastic bags and placed, not tossed, into dumpster so bags do not break open.
❑	❑	Food that has come in direct contact with pests (such as ants, mice, cockroaches, meal worms, or other stored product pests) is considered contaminated and is discarded promptly.
❑	❑	Packing and shipping trash (bags, boxes, pallets) is promptly and properly disposed of or recycled.
❑	❑	Recyclable containers are washed with soapy water before storage or stored refrigerated or in pest-proof containers and regularly moved off-site.
❑	❑	Waste with liquid food residues (e.g., milk cartons, juice boxes) are drained of excess liquid before discarding.
❑	❑	Weather stripping and door sweeps are present and in good condition on exterior doors.

Action needed: **Completed (Date/Initials)**

Storage

Yes	No	
❑	❑	Stored products are rotated on a "first in, first out" basis. Storing unnecessary quantities of items is avoided.
❑	❑	Food storage areas are inspected twice monthly for evidence of pests.
❑	❑	Any evidence of pests (droppings, insects, webbing, gnawed holes in packaging or walls) are promptly recorded in the logbook and reported to the IPM coordinator for appropriate action.
❑	❑	Food products are stored in refrigerators or in pest-proof containers.
❑	❑	Torn or broken food packaging is repaired as soon as possible or, if damaged, the food is repacked in new containers.
❑	❑	Foodstuffs and dry goods are stored at least 12" off the floor in tightly sealed, pest-proof containers such as plastic storage boxes.
❑	❑	If possible, shelving units are kept away from walls to allow for inspection
❑	❑	Open metal shelving is used for storage. Wooden shelving is avoided.
❑	❑	Food and non-food items are stored separately to facilitate inspection and pest prevention.
❑	❑	Food is not left uncovered or exposed overnight.
❑	❑	Inspection aisles (at least 6" x 6") are maintained around bulk stored products.
❑	❑	Shelf paper is not used.

Action needed: **Completed (Date/Initials)**

Other Control Measures

Yes	No	
❑	❑	Unscreened doors and windows leading outdoors (especially to dumpsters) from food service areas are never left propped open.
❑	❑	Broken door sweeps, screens, and door closers are promptly reported and repaired.
❑	❑	Cracks and crevices in walls and floors and around permanent fixtures are promptly reported and caulked.
❑	❑	Purchases of new kitchen appliances and fixtures are of pest-resistant design (i.e., open design, few or no hiding places for insects, freestanding and on casters or wheels for easy thorough cleaning).

Action needed: **Completed (Date/Initials)**

School IPM Checklist

Office Staff, Teachers, and Students

❑ **Need help with pest control**

Name:_____

Room/Area:_____

School:_____

Date Completed:_____

Signature: _____

Instructions

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2. Check the appropriate "Yes" or "No" boxes.
3. Write any items needing attention (usually indicated by a 'No' response) in the places provided at the end of each section and check the 'Need help' box above.
4. Return completed checklist to the IPM coordinator; keep a copy for your records.

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We are asking for your cooperation with our IPM program! The success of IPM depends on the involvement of many individuals. Students, teachers, school staff, administration, and parents are all participants in the IPM program. Together we can help reduce pest problems and pesticide applications. Do not pressure school staff to apply pesticides; there are other effective means of controlling pest problems. You can have a positive impact on our goal to reduce pest problems by completing the following checklist as indicated by your IPM coordinator.

The most important pest management responsibility of students and staff is sanitation. Much of the prevention and reduction of pest infestation depends on whether or not food is left in classrooms, common areas, and lockers. In addition, staff and students can provide important information by reporting the presence of pests.

Yes	No	
❑	❑	Only district-approved staff are allowed to apply any pesticide including wasp sprays and ant cups.
❑	❑	District policies concerning use of disinfectants, cleaners, and sanitizers are adhered to.
❑	❑	Clogged or leaking plumbing, lavatories, sinks, water fountains, heating/ventiliation systems, or water coolers are promptly reported and repaired.
❑	❑	Sink areas kept clean and dry.
❑	❑	Trash generated after custodians have left is removed from the classroom by end of day.
❑	❑	Work areas are neat and organized.
❑	❑	Leftover or spilled food and beverages are cleaned-up immediately.

Yes	No	
❑	❑	Spills on carpets are reported to maintenance and cleaned immediately.
❑	❑	Empty cans and bottles are rinsed and excess water drained, removed from classrooms, and placed in designated bins.
❑	❑	Recyclables are stored only in designated receptacles.
❑	❑	Classrooms and storage areas are organized; not cluttered or congested. Cardboard boxes are kept to a minimum.
❑	❑	The unit ventilator is clean. If liquid has spilled inside, the filter has been replaced.
❑	❑	All vents, air conditioners, heating units, and unit ventilators are not blocked (nothing placed on unit ventilators).
❑	❑	All malfunctioning equipment, especially heating, ventilating, air conditioning, and plumbing, is promptly reported and repaired.
❑	❑	Windows screens in good repair.
❑	❑	Windows without screens are kept closed.
❑	❑	Exterior doors that could allow pests to enter are kept closed.
❑	❑	Refrigerators, vending machines, and microwaves are clean and free of spills.
❑	❑	Sticky traps and bait boxes to monitor or kill pests are tamper-proof and inaccessible to students.
❑	❑	No pesticides, cleaning products, or other chemicals are stored in classrooms. Any pesticides stored on school property are kept in locked cabinets.
❑	❑	Open, unsealed food is not stored in desks, file cabinets, or lockers.
❑	❑	Keep potted plants to a minimum. Avoid overwatering and check regularly for pests and moldy smell.
❑	❑	Cracks and crevices in walls, floors, around pipes, under cabinets, etc. are promptly reported and sealed.
❑	❑	Lockers and desks are emptied and cleaned at least twice per year.
❑	❑	Sufficient space between coat hooks is provided so that each child's hat and coat do not touch those of another to prevent spreading of head lice.
❑	❑	Food, food wrappers, and open beverage containers are removed from lockers, desks, and teachers' rooms daily
❑	❑	Potential pest food items used in classrooms (e.g., beans, plant seeds, pet food and bedding, decorative corn, gourds) are refrigerated or stored in glass or metal containers with pest-proof lids.
❑	❑	Food and beverages are allowed only in designated areas that are cleaned daily.
❑	❑	Materials are stored away from walls and off floors to allow for regular pest inspection.
❑	❑	Animal wastes from classroom pets or laboratory animals are flushed or placed in sealed containers before disposal.
❑	❑	Heavy furnishings and equipment (e.g., staff desks, bookcases, filing cabinets) are moved to permit thorough cleaning around and underneath at least annually.
❑	❑	Furniture that is rarely moved (e.g., staff desks, bookcases, filing cabinets) are of a design that permits complete cleaning under and around the furniture, or ready movement for cleaning purposes.

- ❑ ❑ Overstuffed furniture is avoided. Used furniture and other items are checked thoroughly for pests before being brought into schools.
- ❑ ❑ Students are instructed not to exchange hats, scarves, combs, and brushes.
- ❑ ❑ Information about pest ecology, pesticides, and IPM is included in appropriate curricula.

Action needed: **Completed (Date/Initials)**

School IPM Checklist

School Nurse/Health Coordinator

❑ **Need help with pest control**

Name:_____

Room/Area:_____

School:_____

Date Completed:_____

Signature: _____

Instructions

1. Read the information on this sheet.
2. Check the appropriate "Yes" or "No" boxes.
3. Write any items needing attention (usually indicated by a 'No' response) in the places provided at the end of each section and check the 'Need help' box above.
4. Return completed checklist to the IPM coordinator; keep a copy for your records.

It has been well documented that pests and pesticides contribute to asthma and other health problems. It is the policy of this school district to manage pest problems in ways that pose the least hazard to human health and the environment. To this end, we have adopted an integrated pest management (IPM) program. IPM combines pest prevention, non-chemical pest control methods, and the appropriate use of pesticides that are the least harmful to human health and the environment. By addressing and correcting the root causes of pest problems, IPM can provide long-term, economical pest control and minimize the risk of pesticide exposure.

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Yes	No	
❑	❑	School health professional is a member of the school's environmental, safety, IPM, and indoor air quality teams.
❑	❑	School health professional maintains MSD sheets for all pesticides used on school property.
❑	❑	The school health professional is aware of the connection among allergies, air quality, pests, and pesticides.
❑	❑	School health professional is trained to identify the signs and symptoms of pesticide exposure.
❑	❑	The school health professional communicates with administration, teachers, custodians, and contractors to minimize risk of unhealthful chemical exposure to school staff and students.
❑	❑	Records of all children and staff members with asthma or chemical sensitivities are maintained.
❑	❑	A log of health complaints that notes symptoms, location and time of symptom onset, and exposure to pollutant sources is maintained.
❑	❑	The school health professional is alert to potential trends in health complaints, especially in timing or location of complaints.

Yes	No	
❑	❑	Policies/procedures addressing animals in the classroom are in place. The best way to keep the school free of animal allergens is to keep animals out of school.
❑	❑	School health professional communicates accurate head lice information to parents, students, and school staff.
❑	❑	School health professional knows effective, alternative head lice treatments and where to get more information.
❑	❑	School health professional emphasizes to parents the importance of reading and following the instructions on lice-control shampoos if a parent chooses to use these products.
❑	❑	School health professional can explain the limitations and actual effects of over-the-counter and prescription treatments on head lice at their different life stages.
❑	❑	Policies/procedures addressing the use of insect repellents are in place.

Action needed: **Completed (Date/Initials)**

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School IPM Fact Sheet

Pesticides, State Regulations, and IPM in Maine Schools

What is a pesticide?

- A pesticide is any natural or man-made chemical product that claims to kill, repel, or mitigate a living organism. Pesticides typically used on school properties include: ant cups, insect sprays, and dusts; weed control products; mouse poisons; and disinfectants applied to control mold or germs. Most, but not all, pesticides sold in Maine have an 'EPA Reg. No.' (EPA Registration Number) on the container label.

May pesticides be used in schools?

- Pesticides may only be legally applied in Maine schools by persons having a valid commercial pesticide applicators license in the proper category for the intended purpose. The exceptions to this regulation are the use of disinfectants used for routine cleaning, the use of insect repellents for personal protection, and emergency use of over-the-counter insecticides for control of stinging or biting insects that pose an immediate threat to human health.

What is required by the new regulation, *Standards for Pesticide Applications and Public Notifications in Schools*?

- All schools must adopt and implement an integrated pest management (IPM) policy.
- Superintendents or school boards must appoint an IPM coordinator.
- Within the first 2 weeks of school, parents, guardians, and school staff must be notified about the school's IPM policy and notification procedures for possible pesticide use during the year.
- Public and private schools must notify parents, guardians, and staff before pesticides are used in schools or on school grounds.

Does this new regulation apply to childcare programs and preschools, too?

- Yes, if the childcare program is in a school or shares facilities with any grades K through 12.

Do licensed school staff follow the same regulations as contracted pest management professionals?

- Yes. See *Certification and Licensing for Commercial Applicators* in this chapter.

Why did the Board of Pesticides Control adopt this regulation?

- The Board convened a diverse stakeholder committee representing school administrators and staff, pest management professionals, environmental organizations, and others who developed the regulation to address potential health risks posed by the use of pesticides in schools.

Must the school hire an outside contractor to do pest management?

- No. Many pest management solutions can be done by school staff. The most effective solutions include keeping facilities clean and well maintained, regularly inspecting buildings and grounds for evidence of pests and pest prevention needs, and using non-pesticide pest traps. Pesticides may not be needed.

Does the Board of Pesticides Control recommend any specific pest control companies or have any companies been contracted to help with compliance?

- No. The BPC does not recommend any specific pest control company and no company has been contracted to help with compliance with this rule. The Board can make available a list of licensed companies and recommends that schools use the contracting guidelines available at www.thinkfirstspraylast.org/schoolipm/ or by calling 207-287-7545.

What is required of the Integrated Pest Management Coordinator?

- The IPM coordinator is a *school employee, not a contractor*, who implements the school IPM policy. This person must be knowledgeable about IPM, but is NOT required to be licensed unless pesticide application is also part of their duties. However, many schools find that having a staff member become licensed is an asset whether contracting for IPM services or doing it in-house.
- Maintains the pest management and pesticide application records.
- Notifies parents, guardians, and staff and ensures that required signs are posted in advance of non-exempted pesticide applications (see below).
- Makes available to requesting parents, guardians or staff a copy of the *Standards for Pesticide Applications and Public Notifications in Schools*, pesticide application records, and information about pesticides used at the school.
- Makes the school's IPM policy available to anyone requesting it.
- Ensures all pesticide applications are performed in compliance with the school's IPM policy.

How must the initial notification be done?

- We recommend it be included in the school's handbook given out at the start of each year. The notice can also be sent home in backpacks, by e-mail, or any other way as long as the school is assured that all staff, parents, and guardians receive it**.** (See the Planning and Notification Templates chapter for sample notification letters.)

If the school does not use any pesticides, must the initial notice be given?

- Yes. The regulation requires that all schools adopt an IPM policy and that all schools notify staff, parents, and guardians about the policy, where it may be reviewed and how the school plans to notify parents and staff before a pesticide is applied.

How is specific pesticide application notification given?

- Schools must notify parents, guardians, and staff at least 5 days in advance of non-exempted pesticide applications, providing specific information about the pesticide.
- Schools can choose between providing universal notice to all staff, parents, or guardians before each non-exempted pesticide application or only to those requesting to be put on a notification registry.
- At least two working days prior to non-exempted pesticide applications schools must also post required signs at points of access and in a common area of the school. See *Standards for Pesticide Applications and Public Notifications in Schools* in this chapter for specifics.

How much will it cost to comply with this regulation?

- Unless a school chooses to send notices via U.S. mail, there should be minimal costs for printing the required notices and signs. Other infrequent costs include optional training sessions, optional licensing of school staff to apply pesticides and the resource materials associated with training and licensing. In the long term, integrated pest management programs usually cost less than traditional monthly pesticide applications. Cost of non-compliance could be much higher!

Standards for Pesticide Applications and Public Notifications in Schools

Department of Agriculture, Food & Rural Resources,
Board of Pesticides Control, Chapter 27

SUMMARY: These regulations establish procedures and standards for applying pesticides in school buildings and on school grounds. This chapter also sets forth the requirements for notifying school staff, students, visitors, and parents about pending pesticide applications. This rule becomes effective August 30, 2003.

Section 1. Definitions

A. Integrated Pest Management. For the purposes of this regulation, integrated pest management (IPM) means the selection, integration, and implementation of pest damage prevention and control based on predicted socioeconomic and ecological consequences, including:
   1. Understanding the system in which the pest exists.
   2. Establishing dynamic economic or aesthetic injury thresholds and determining whether the organism or organism complex warrants control.
   3. Monitoring pests and natural enemies.
   4. When needed, selecting the appropriate system of cultural, mechanical, genetic, including resistant cultivars, biological or chemical prevention techniques or controls for desired suppression.
   5. Systematically evaluating the pest management approaches utilized.

B. School. For the purposes of this regulation, School means any public or private elementary or secondary school, kindergarten, or nursery school that is part of an elementary or secondary school or a tribally funded school.

C. School Building. For the purposes of this regulation, School Building means any structure used or occupied by students or staff of any school.

D. School Grounds. For the purposes of this regulation, School Grounds means:
   1. Land associated with a school building including playgrounds, athletic fields and agricultural fields used by students or staff of a school.
   2. Any other outdoor area used by students or staff that is under the control of a school.

E. Integrated Pest Management Coordinator. The lead person in a school system or school who is knowledgeable about integrated pest management and is designated by each school to implement the school pest management policy.

Section 2. Integrated Pest Management Policy and Coordinator

A. All public and private schools in the State of Maine shall adopt and implement a written policy for the application of integrated pest management techniques in school buildings and outdoors on school grounds.

B. Each school shall appoint an IPM coordinator who shall maintain the school's integrated pest management policy. The IPM coordinator shall keep at least one copy of the policy on site in every school and make it available to the public upon request.

Section 3. Exemptions

A. The following pesticide uses are exempt from the requirements of Section 4 and 5 of this Chapter:

1. Application of ready-to-use general use pesticides by hand or with non-powered equipment to control or repel stinging or biting insects when there is an urgent need to mitigate or eliminate a pest that threatens the health or safety of a student, staff member or other occupant.
2. Application of general use antimicrobial products by hand or with non-powered equipment to interior or exterior surfaces and furnishings during the course of routine cleaning procedures.
3. Application of paints, stains or wood preservatives that are classified as general use pesticides.

B. The following pesticide uses are exempt from the requirements of Section 4 of this Chapter:

1. Non-volatile liquids injected into cracks, crevices or wall voids.
2. Non-volatile baits, gels, pastes and granular materials placed in areas inaccessible to students.
3. Indoor or outdoor applications performed when school is not in session and will not be in session until the re-entry or restricted entry interval specified on the pesticide label has elapsed.
4. Indoor application of a pesticide with no re-entry or restricted entry interval specified on its label but entry to the treated area is restricted for at least 24 hours.

> The BPC has adopted the following statement until an amendment is added to define "non-volatile" in the Department of Agriculture, Food and Rural Resources Rule Chapters.
>
> **Non-volatile.** "Non-volatile" means a product with a vapor pressure of less than 10 Pascals (0.75 millimeters of mercury) at 25° Centigrade (77° Fahrenheit).

Section 4. Notification

A. Within the first two weeks of every school year, notice shall be given by all schools to all school staff and parents or legal guardians of students advising them that a school integrated pest management policy exists and where it may be reviewed, that pesticides may periodically be applied in school buildings and on school grounds and that applications will be noticed in accordance with Sections 4(B-D) hereof. This notice shall also state that a report of prior pesticide applications and information about the pesticides used and a copy of the Pesticides in Schools regulation (CMR 01-026 Chapter 27) are available for review.

B. Notices given as required by Section 4C shall state, as a minimum: (a) the trade name and EPA Registration number of the pesticide to be applied; (b) the approximate date and time of the application; (c) the location of the application; (d) the reasons for the application; and (e) the name and phone number of the person to whom further inquiry regarding the application may be made. These notices must be sent to school staff and parents or legal guardians of students at least five days prior to the planned application.

C. Schools shall provide notice of pesticide applications in accordance with either Section 4C(1) or 4C(2).

1. Notice may be given to all school staff and parents or legal guardians of students using a school whenever pesticide applications not exempted by Section 3 are performed inside a school building or on the school grounds, or
2. The school may establish a notification registry whereby persons wishing notification of each application performed inside a school building or on school grounds may make a written request to be put on the registry list to receive notice whenever pesticide applications not exempted by Section 3 are performed.

D. In addition to the notice provisions above, whenever pesticide applications not exempted by Section 3 are performed in a school building or on school grounds, a sign shall be posted at each point of access to the treated area and in a common area of the school at least two working days prior to the application and for at least forty-eight hours following the application. Posting of the notification signs as required by this Chapter satisfies the posting requirements of Chapter 28 of the Board's regulations.

1. The signs shall be:
   a. At least 8.5 inches wide by 11 inches tall for indoor applications.
   b. At least 5 inches wide by 4 inches tall for outdoor applications.
   c. Made of rigid, weather resistant material that will last at least ninety-six (96) hours when placed outdoors.
   d. Light colored (white, beige, yellow or pink) with dark, bold letters (black, blue, red, or green).
2. The signs for indoor applications must bear:
   a. The word CAUTION in 72 point type.
   b. The words PESTICIDE APPLICATION NOTICE in 30 point type or larger.
   c. Any reentry precautions from the pesticide labeling in at least 12 point type.
   d. The trade name and EPA Registration number(s) of the pesticide(s) to be applied in at least 12 point type.
   e. The approximate date and time of the application in at least 12 point type.
   f. The location of the application in at least 12 point type.
   g. The reason(s) for the application in at least 12 point type.
   h. The name and phone number in at least 12 point type of the person to whom further inquiry may be made regarding the application.
3. The signs for outdoor applications must bear:
   a. The word CAUTION in 72 point type.
   b. The words PESTICIDE APPLICATION in 30 point type or larger.
   c. The Board designated symbol.
   d. Any reentry precautions from the pesticide labeling in at least 12 point type
   e. The trade name and EPA Registration number(s) of the pesticide(s) to be applied in at least 12 point type.

Board Designated Symbol for Posting Outdoor Pesticide Applications to School Grounds

f. The approximate date and time of the application in at least 12 point type.
g. The location of the application in at least12 point type.
h. The reason(s) for the application in at least 12 point type.
i. The name and phone number of the person to whom further inquiry regarding the application may be made in at least 12 point type.

Section 5. Integrated Pest Management Techniques

A. All pest management activities should be conducted using appropriate elements of integrated pest management as described in the latest Cooperative Extension or Department of Agriculture training manuals for pest management in and/or on school property. In all cases, the application should be conducted in a manner to minimize human risk to the maximum extent practicable using currently available technology.

B. Prior to any pesticide application the following steps must be taken and recorded:

1. Monitor for pest presence or conditions conducive to a pest outbreak.
2. Identify the pest specifically.
3. Determine that the pest population exceeds acceptable safety, economic or aesthetic threshold levels established in the IPM policy.
4. Utilize non-pesticide control measures that have been demonstrated to be practicable, effective and affordable.

C. When a pesticide application is deemed necessary, the licensed applicator must take into account the toxicity of recommended products and choose lowest risk products based on efficacy, the potential for exposure, the signal word on the pesticide label, the material safety data sheet, other toxicology data and any other label language indicating special problems such as toxicity to wildlife or likelihood of contaminating surface or ground water.

D. Pesticide applications must not be conducted when people are in the immediate area to be treated. When space, spot, or fumigation applications are conducted the heating, ventilation, and air conditioning (HVAC) systems in the area must be shut off or the entire building must be evacuated. Applications should be planned to occur on weekends or vacations to allow maximum time for sprays to dry and vapors to dissipate.

E. Indoor pesticide use must be limited to placement of baits and wall void or crack and crevice treatments unless the pest threatens the health and safety of persons in the buildings as determined by the school's integrated pest management coordinator.

F. Outdoor applications must be conducted in accordance with all other applicable Board regulations designed for minimizing pesticide drift and posting of treated sites. Spot treatments should be considered in lieu of broadcast applications.

G. The integrated pest management coordinator must maintain records for a period of two years following all pesticide applications performed along with the labels and material safety data sheets for all products used in or on school property.

Certification and Licensing for Commercial Applicators in Maine

Maine Law requires a commercial pesticide applicator license to apply any pesticides in schools or on school grounds except for routine cleaning, emergency protection from stinging insects, or application of paints, stains, and wood preservatives.

Commercial certification

- Every commercial applicator must be one of the following:
  1. Licensed as a commercial applicator/master.
  2. Licensed as a commercial applicator/operator.
  3. Supervised on-site by either a licensed commercial applicator/master or a commercial applicator/operator who is physically present and directly overseeing the application. This supervision must include visual and voice contact. Visual contact must be continuous except when topography obstructs visual observation for less than five minutes. Video contact does not constitute visual observation. The voice contact requirement may be satisfied by real time radio or telephone contact.

- Each branch office of any company, agency, organization, or self-employed individual ("employing entity") required to have personnel licensed commercially under state pesticide law shall have in its employment at least one master applicator. This master must be licensed in all categories which the branch office of the company or agency performs applications and any operators must also be licensed in the categories in which they perform or supervise pesticide applications. This master applicator must actively supervise persons applying pesticides within such employing entity and have the ability to be on site to assist such persons within six (6) hours driving time. Whenever an out-of-state employing entity is conducting a major application project, they must have a master applicator within the state.

- Persons wishing to obtain a *commercial applicator/operator* license must be certified by passing written, closed book examinations (with a score of 80% or greater) covering general pesticide information (core exam) and categories that represent each type of application to be performed or supervised.

- Persons wishing to obtain a *commercial applicator/master* license must meet the commercial applicator/operator requirements and pass a written, closed book regulation examination (with a score of 80% or better) and an oral examination conducted by the BPC staff.

- Tests are scheduled by the BPC after receiving a completed application form and a $10 fee for the core exam and each category exam requested. Forms are available online at http://www.state.me.us/agriculture/pesticides/forms.htm. Tests are conducted at the BPC offices in Augusta and, with special arrangements, in Presque Isle. A $15 surcharge will be incurred whenever an examinee fails to notify the BPC staff at least 24-hours prior to canceling a scheduled exam.

- Commercial license examinees must pass both the core and at least one category or commodity exam within one year. If an applicant passes only one of the required exams within a year, he or she must retake even those previously passed before qualifying for certification.

- In order to maintain certification status, commercial applicators are required to accumulate 12 recertification credits over the six-year certification period. Each credit represents one hour of pest management training. Master applicators must accumulate 18 credits in six years. Of these credits, at least three must be in a category for which they are licensed and at least one credit hour must be in environmental science, ecology, or toxicology. The BPC assigns and records credit for certain pesticide applicator training sessions offered by Cooperative Extension, industry, and trade organizations. The BPC may assign credit to training sessions offered in other states after receiving a detailed agenda and proof of attendance.

- Certification lapses if insufficient credits are accumulated during the six year period. Renewal requires successful completion of all exams. In all other cases, recertification credits expire at the end of the certification period and are not carried over to the next certification period.

Commercial licensing

- A biennial $70 application fee is required to obtain a 2-year commercial applicator license at the master or operator level.

- Each school making its own applications must have at least one licensed commercial applicator/master. This master must directly supervise all other operator-licensed employees, and must be present at all application sites when unlicensed employees apply pesticides.

- All commercial applicators must keep records of all pesticide applications.

- Commercial applicators must submit an annual summary report to the BPC on or before January 15th. Failure to submit required reports will result in license suspension or refusal to renew licenses.

For more information

Maine Board of Pesticides Control
207-287-2731
pesticides@maine.gov
www.thinkfirstspraylast.org

School IPM Fact Sheet

Pestproofing

A straightforward pest control solution is simply to change the conditions that allowed the insect or animal to become a pest in the first place. One way to do this is to make physical or mechanical changes that will make the location less attractive to pests or that will keep them from entering buildings. Pestproofing can be as simple as repairing screens and caulking cracks or as sophisticated as landscaping with pest and disease-resistant plants. Some physical alterations can be expensive and time-consuming but they usually are permanent solutions. You may do some pestproofing yourself, and you may make pestproofing recommendations to school administrators, maintenance staff, or outside contractors.

Pestproofing Buildings

- Install weather stripping or door sweeps on doors. Inspect them regularly and replace as needed.
- Repair screens on windows and doors and make sure they fit tightly.
- Screen floor drains and outside vent openings.
- Install air curtains over loading docks and other open doorways.
- Seal cracks and crevices in interior and exterior walls.
- Caulk, stuff with steel or copper wool, or seal openings around pipes and conduits where they enter the building.
- Caulk crevices around doors, windows, vents, plumbing fixtures, equipment, cabinets, and counter tops.
- Repair grout around wall and floor tiles in restrooms, locker rooms, and other sites.
- Repair roof leaks that may attract carpenter ants and other moisture loving pests.
- Repair leaky plumbing in restrooms, kitchens, and laboratories.
- Install porcupine wire, pin and wire, or similar commercial products to keep birds from roosting on window ledges and other building surfaces.
- Use pest-proof storage boxes. Unpack and discard cardboard boxes. Deep clean buildings, especially where food and drinks are served, eaten, or stored. Rinse returnables and take them off-site at least weekly.

Pestproofing on the Grounds

- Install a concrete pad under the dumpster or garbage pickup area to make it easier to clean the site and to prevent rodents and other pests from burrowing or nesting underneath.
- Make sure all trash cans on the grounds have closing lids to discourage yellowjackets and flies.
- Pull organic mulch away from the building's walls. Wood mulch invites carpenter ants and moisture-loving pests like millipedes, sowbugs, and earwigs. Instead, install a 2-3 foot wide mulch-free band around the perimeter. Leave the area bare or fill it with pea gravel, crushed stone or shell.
- Thin or remove dense shrubbery and ground covers around the building's foundation. Dense vegetation provides good cover for rodents and makes it difficult to inspect and treat burrows.
- Trim tree branches within 6 feet of the building and remove vines on the building. Ants, squirrels, and roof rats especially, often follow branches or vines to enter a building.
- Remove dead trees and stumps from around buildings to keep carpenter ants and other pests from infesting the building.

- Remove plants that are hosts to specific invading pests and replace them with pest and disease-resistant varieties. For example, boxelder bugs feed on the female boxelder tree, often moving into buildings in the fall. Removing these trees from the area will eliminate problems with boxelder bugs. Keep ornamental plants and lawn healthy and pest-free through proper watering, fertilizing, and pruning.
- Fill or drain low spots to eliminate standing water that breeds mosquitoes and other flies. Align downspouts so that water drains away from the building.
- Remove piles of wood, stone, or other materials or stack them off the ground and away from building foundations.

School IPM Fact Sheet

Choosing the Proper Pesticide

Whether you contract for pesticide applications or do it yourself, there are important regulations and guidelines to follow. The health of school residents and prevention of pest problems must be the primary objectives that guide pest management in schools.

- Look for alternatives to pesticides first, like pest-proofing and sanitation practices, to prevent wasp, fly, and rodent problems and watering, mowing, and fertilization practices to reduce weed problems in lawns and athletic fields.
- If a pesticide application is still deemed necessary to adequately manage pests; follow these essential steps to ensure the pesticide is applied properly and effectively.

1. A commercial pesticide applicator license is required to apply pesticides on school grounds. This includes 'weed and feed' fertilizers, herbicides (weed-killers), rodenticides (mouse and rat baits), insecticides (insect-killers), fungicides (most mold and mildew treatments, plant disease treatments), etc. *Any product with an EPA Registration number on the label is a pesticide.* Verify that the person doing the application is licensed.

2. Choose least-toxic pesticides. Read the label and MSD sheets that come with the pesticide or call the Board of Pesticides Control to have them faxed to you (also available on line at the website listed below). Choose products with the signal word *Caution* if possible. Avoid those with the signal words *Warning* or *Danger*. Check the MSDS for other human health risks. Chronic toxicity and environmental impact are also important. Check the label and MSDS for mentions of these hazards, especially if wellheads, ponds or streams are nearby. Some newer, less-toxic pesticides appear more expensive than some older, more toxic ones. But the newer materials tend to be effective in smaller doses—one container goes a long way. The less-toxic pesticides are often the best buy in the long-run.

3. Choose an effective product. Identify the pest, then make sure the pesticide is labeled for use against your pest. Pesticidal soaps and oils can be effective against soft bodied insects and some weed seedlings and are less toxic to humans and beneficial insects such as lady bugs. Microbial pesticides containing *Bacillus thuringiensi*s (Bt) can be purchased for control of caterpillars or mosquito larvae.

4. Choose the best formulation. Carefully consider risks of human exposure, environmental impact, and effectiveness when determining which formulations (liquid, granular, dust, etc.) to use. For example, spot treatment with baits, granulars, or ready-to-use formulations present less exposure potential than broadcast applications.

5. Choose a product with less odor when possible. A product's effectiveness is not related to its odor, but odors can cause adverse reactions in persons with chemical sensitivities.

6. Follow the label's instructions carefully.

- Applicators are required by law to wear the safety equipment specified on the label. Make sure all necessary safety equipment and clothing are worn.
- Mix, apply, and store pesticides exactly as directed. Never apply at a higher rate than the label allows.
- Calibrate the application equipment to make sure pesticide is applied at the labeled rate.

7. Spot treat whenever possible. Direct the pesticide to the infested area rather than applying a broadcast treatment. This method reduces risks and pesticide costs while assuring effective pest control.

8. Timing is everything! It is critical to ensure children and other people do not enter the treated area too soon. Check the label for the Re-Entry Interval (REI) to determine how soon after the application it is legal to allow people to enter the area. In school settings, it's best to allow for as long an interval as possible. *Apply pesticides only when students and staff are not present and allow enough time before people are allowed to enter.*

9. Keep records. Record when, what, and where pesticides are applied, name of applicator, and rate used. Keep labels and MSD sheets on file.

10. Monitor for effectiveness. Check the pest population afterwards to see if treatment was effective. Keep checking to see how long it was effective.

11. Be prepared for chemical emergencies. Keep a list of whom to call for help and the kinds of first aid to be administered before help arrives. Place the list in an accessible area near a phone.

12. Dispose of pesticides properly. Do not pour them down the drain or into toilets! Contact the Maine Board of Pesticides Control if unsure about how to dispose of the pesticide.

13. Notification and posting. Outdoor areas treated with pesticides must be posted according to state regulations (Chapters 27 and 28) which require that 4"x 5" signs be placed around the treated area at points of entry. It is advisable to notify students, staff and parents of upcoming pesticide applications, paying particular attention to those individuals that may be of higher risk. You may also be required to notify neighbors when pesticides are applied if they request.

14. Ask, don't guess. Choosing pesticides is important and not necessarily simple; use the following resources for more help.

Resources

Pest control product manufacturers and dealers know their own products, so ask them about toxicity, effectiveness, formulations, and least-toxic (including traps and other non-toxic) products.

University of Maine Pest Management Office: tel. 800-287-0279 or 207-581-3880. Pest diagnoses, pesticide information, IPM, product recommendations.

Maine Forest Service: tel. 287-243l. Tree and forest pest diagnoses; tick, mosquito and browntail moth management; and product recommendations.

BPC: tel. 207-287-2731 or <*http:/www.thinkfirstspraylast.org*>. A good place to find out how toxic or leachable a product is, if it is labeled for specific sites, or if registered in Maine. Also product facts sheets and links to MSDS and pesticide labels.

ExToxNet: A web resource for comparing product toxicities. Compiled by Extension offices nationwide, it's found at <*http://ace.ace.orst.edu/info/extoxnet/*>.

U.S.EPA: One would think the folks who regulate the stuff ought to offer fact sheets and other product-specific information, they do: <*http://www.epa.gov/pesticides/factsheets/*>.

School IPM Fact Sheet

Mold and Moisture Problems

Modified from *Indoor Air Quality Tools for Schools* (IAQ TfS) *Action Kit*
EPA document number 402-K-05-001

Molds can be found almost anywhere; they can grow on virtually any substance where moisture is present. There are molds that can grow on and within wood, paper, carpet, and foods. When excessive moisture accumulates in buildings or on building materials mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. There is no practical way to eliminate all mold and mold spores in the indoor environment; the way to control indoor mold growth is to control moisture. Molds produce tiny spores to reproduce. Mold spores continually waft through the indoor and outdoor air continually. When mold spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on in order to survive.

There are many different kinds of mold. Molds can produce allergens, toxins, and/or irritants. Molds can cause discoloration and odor problems, deteriorate building materials, and lead to health problems such as asthma episodes and allergic reactions in susceptible individuals.

The key to mold control is moisture control. If mold is a problem, clean up the mold and get rid of excess water or moisture. Maintaining the relative humidity between 30%-60% will help control mold.

Condensation, Relative Humidity, and Vapor Pressure

Mold growth does not require the presence of standing water, leaks, or floods; mold can grow when the relative humidity of the air is high. Mold can also grow in damp areas such as unvented bathrooms and kitchens, crawl spaces, utility tunnels, gym areas and locker rooms, wet foundations, leaky roof areas, and damp basements. Relative humidity and the factors that govern it are often misunderstood. This section discusses relative humidity and describes common moisture problems and their solutions.

Water enters buildings both as a liquid and as a gas (water vapor). Water is introduced intentionally at bathrooms, gym areas, kitchens, and art and utility areas and accidentally by way of leaks and spills. Some of the water evaporates and joins the water vapor that is exhaled by building occupants. Water vapor also moves into the building through the ventilation system, through openings in the building shell, or directly through building materials.

The ability of air to hold water vapor decreases as the air temperature falls. If a unit of air contains half of the water vapor it can hold, it is said to be at least 50% relative humidity (RH). The RH increases as the air cools and approaches saturation. When air contains all of the water vapor it can hold, it is at least 100% RH, and the water vapor condenses, changing from a gas to a liquid. The temperature at which condensation occurs is the "dew point."

It is possible to reach 100% RH without changing the air temperature, by increasing the amount of water vapor in the air (the "absolute humidity" or "vapor pressure"). It is also possible to reach 100% RH without changing the amount of water vapor in the air, by lowering the air temperature to the "dew point."

The highest RH in a room is always next to the coldest surface. This is referred to as the "first condensing surface," as it will be the location where condensation happens first if the relative humidity of the air next to the surface reaches 100%. It is important to understand this when trying to understand why mold is growing on one patch of wall or only along the wall-ceiling joint. It is likely that the surface of the wall is cooler than the room air because there is a gap in the insulation or because the wind is blowing through cracks in the exterior of the building.

Mold and Health Effects

Molds are a major source of indoor allergens. Molds can also trigger asthma. Even when dead or unable to grow, mold can cause health effects such as allergic reactions. The types and severity of health effects associated with exposure to mold depend, in part, on the type of mold present and the extent of the occupants' exposure and existing sensitivities or allergies. Prompt and effective remediation of moisture problems is essential to minimize potential mold exposures and their potential health effects.

Taking Steps to Reduce Moisture and Mold

Moisture control is the key to mold control. Respond to water damage within 24-48 hours to prevent mold growth.

Mold growth can be reduced if relative humidity near surfaces can be maintained below the dew point. This can be done by: 1) reducing the moisture content (vapor pressure) of the air, 2) increasing air movement at the surface, or 3) increasing the air temperature (either the general space temperature or the temperature at building surfaces).

Either vapor pressure or surface temperature can be the dominant factor in a mold problem. A vapor pressure dominated mold problem may not respond well to increasing temperatures, whereas a surface temperature dominated mold problem may not respond very well to increasing ventilation. Understanding which factor dominates will help in selecting an effective control strategy.

If the relative humidity near the middle of a room is fairly high (e.g., 50% at 70°F), mold or mildew problems in the room are likely to be vapor pressure dominated. If the relative humidity near the middle of a room is fairly low (e.g. 30% at 70° F), mold or mildew problems in the room are likely to be surface temperature dominated.

Vapor Pressure Dominated Mold Growth

Vapor pressure dominated mold growth can be reduced by using one or more of the following strategies:

- Use source control (e.g., direct venting of moisture-generating activities such as showers to the exterior).
- Dilute moisture-laden indoor air with outdoor air at a lower absolute humidity.
- Dehumidify the indoor air.

Note that dilution is only useful as a control strategy during heating periods, when cold outdoor air contains little total moisture. During cooling periods, outdoor air often contains as much moisture as indoor air.

Surface Temperature Dominated Mold Growth

Surface temperature dominated mold growth can be reduced by increasing the surface temperature using one or more of the following approaches:

- Raise the temperature of the air near room surfaces.
- Raise the thermostat setting improve air circulation so that supply air is more effective at heating the room surfaces.
- Decrease the heat loss from room surfaces
- Add insulation close cracks in the exterior wall to prevent "wind washing" (air that enters a wall at one exterior location and exits another exterior location without penetrating into the building).

Consider an old, leaky, poorly insulated school in Maine that has mold and mildew in the coldest corners of one classroom. The indoor relative humidity is low (30%). It is winter and cold air cannot hold much water vapor. Therefore, outdoor air entering through leaks in the building lowers the airborne moisture levels indoors. This is an example of a surface temperature dominated mold problem. In this building, increasing the outdoor air ventilation rate is probably not an effective way to control interior mold and mildew. A better strategy would be to increase surface temperatures by insulating the exterior walls, thereby reducing relative humidity in the corners.

Consider a school locker room that has mold on the ceiling. The locker room exhaust fan is broken, and the relative humidity in the room is 60% at 70°F. This is an example of a vapor pressure dominated mold problem. In this case, increasing the surface temperature is probably not an effective way to correct the mold problem. A better strategy is to repair or replace the exhaust fan.

Mold Clean Up

The key to mold control is moisture control. It is essential to clean up the mold and get rid of excess water or moisture. If the excess water or moisture problem is not fixed, mold will most probably grow again, even if the area was completely cleaned. Clean hard surfaces with water and detergent and dry quickly and completely. A household mixture of 1 part bleach to 10 parts water works well as a final wash. (From: *A School's Guide to Dealing with Mold Using IPM. Wisconsin Department of Agriculture. Trade and Consumer Protection.*) Always wear gloves and eye protection and provide proper ventilation when using bleach and other chemical cleansers and disinfrectants. Absorbent materials such as ceiling tiles may have to be discarded.

Note that mold can cause health effects such as allergic reactions; remediators should avoid exposing themselves and others to mold.

Wear waterproof gloves during clean up; do not touch mold or moldy items with bare hands. Respiratory protection should be used in most remediation situations to prevent inhalation exposure to mold. Respiratory protection may not be necessary for small remediation jobs with little exposure potential. Refer to the end of this fact sheet and resource listing in the Appendix for sources of more information on mold remediation. When in doubt consult a professional, experienced remediator.

Identifying and Correcting Common Problems

Exterior Corners and Walls

The interior surfaces of exterior corners and behind furnishings such as chalk boards, file cabinets, and desks next to outside walls are common locations for mold growth in heating climates. They tend to be closer to the outdoor temperature than other parts of the building surface for one or more of the following reasons:

- Poor indoor air circulation.
- Wind washing.
- Low insulation levels.
- Greater surface area of heat loss.

Sometimes mold growth can be reduced by removing obstructions to airflow (e.g., rearranging furniture). Buildings with forced air heating systems and/or room ceiling fans tend to have fewer mold problems than buildings with less air movement.

Set-Back Thermostats

Set-back thermostats (programmable thermostats) are commonly used to reduce energy consumption during the heating season. Mold growth can occur when temperatures are lowered in buildings with high relative humidity. (Maintaining a room at too low a temperature can have the same effect as a set-back thermostat.) Mold can often be controlled in heating climates by increasing interior temperatures during heating periods. Unfortunately, this also increases energy consumption and reduces relative humidity in the breathing zone, which can create discomfort.

Air-Conditioned Spaces

Mold problems can be as extensive in cooling climates as in heating climates. The same principles apply: either surfaces are too cold, moisture levels are too high, or both.

One common example of mold growth in cooling climates can be found in rooms where conditioned "cold" air blows against the interior surface of an exterior wall. This condition, which may be due to poor duct design, diffuser location, or diffuser performances, creates a cold spot at the interior finish surfaces, possibly allowing moisture to condense.

Possible solutions for this problem include:

- Eliminate the cold spots (i.e., elevate the temperature of the surface) by adjusting the diffusers or deflecting the air away from the condensing surface.
- Increase the room temperature to avoid overcooling. NOTE: During the cooling season, increasing temperature decreases energy consumption, though it could cause comfort problems.

Mold problems can also occur within the wall cavity, when outdoor air comes in contact with the cavity side of the cooled interior surface. It is a particular problem in rooms decorated with low maintenance interior finishes (e.g., impermeable wall covering such as vinyl wallpaper) which can trap moisture between the interior finish and the gypsum board. Mold growth can be rampant when these interior finishes are coupled with cold spots and exterior moisture.

A possible solution for this problem is to ensure that vapor barriers, facing sealants, and insulation are properly specified, installed, and maintained.

Thermal Bridges

Localized cooling of surfaces commonly occurs as a result of "thermal bridges," elements of the building structure that are highly conductive of heat (e.g., steel studs in exterior frame walls, uninsulated window lintels, and the edges of concrete floor slabs). Dust particles sometimes mark the locations of thermal bridges, because dust tends to adhere to cold spots. The use of insulating sheathings significantly reduces the impact of thermal bridges in building envelopes.

Windows

In winter, windows are typically the coldest surfaces in a room. The interior surface of a window is often the first condensing surface in a room.

Condensation on window surfaces has historically been controlled by using storm windows or "insulated glass" (e.g., double-glazed windows or selective surface gas-filled windows) to raise interior surface temperatures. In older building enclosures with less advanced glazing systems, visible condensation on the windows often alerted occupants to the need for ventilation to flush out interior moisture, so they knew to open the windows.

The advent of higher performance glazing systems has led to a greater number of moisture problems in heating climate building enclosures, because the buildings can now be operated at higher interior vapor pressures (moisture levels) without visible surface condensation on windows.

Concealed Condensation

The use of thermal insulation in wall cavities increases interior surface temperatures in heating climates, reducing the likelihood of interior surface mold and condensation. However, the use of thermal insulation without a properly installed air barrier may increase moisture condensation within the wall cavity. The first condensing surface in a wall cavity in a heating climate is typically the inner surface of the exterior sheathing.

Concealed condensation can be controlled by either or both of the following strategies:

- Reduce the entry of moisture into the wall cavities (e.g., by controlling entry and/or exit of moisture-laden air).
- Raise the temperature of the first condensing surface in heating-climate locations.
- Install exterior insulation (assuming that no significant wind-washing is occurring) in cooling-climate locations.
- Install insulating sheathing to the interior of the wall framing and between the wall framing and the interior gypsum board.

Mold and Moisture References

A School's Guide to Dealing with Mold using Integrated Pest Management. Wisconsin Department of Agriculture, Trade, and Consumer Protection. <http://www.datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/pdf/arm_pub_100.pdf>.

Indoor Air Quality Tools for Schools (IAQ TfS) Action Kit. Dec. 3, 2007. U.S. Environmental Protection Agency. <http://www.epa.gov/iaq/schools/actionkit.html>.

School IPM Fact Sheet

Head Lice

Modified from School Health Manual, Maine Department of Education

Pediculosis capitis refers to symptoms caused by human head lice infesting the head hair of a person. Head lice are not known to transmit infectious agents, nor do they discriminate among socio-economic groups. They are more commonly found on children of preschool and early elementary school age. Overall, about 1% of 5-12 year olds are infested. Girls are infested more often than boys, and parents and siblings sometimes acquire head lice. Lice and their eggs (called nits) are usually limited to the head hair.

Life Stages of Head Lice

Nit (louse egg) - Nits are laid onto the hair shaft, close to the scalp. They are oval in shape and may undergo several color changes as they develop. They take 8-12 days to develop and hatch. With magnification the developing nymph may be seen within the egg. Eggs that have died or hatched will remain firmly attached to the hair, but will never again produce another louse.

Nymph - The nymph is the immature stage of the louse. These look just like an adult louse, only smaller and are unable to reproduce yet. They mature into adults in about 9-12 days after hatching. Nymphs must feed on human blood to survive and grow.

Adult - Adults are about the size of a sesame seed, have six legs, are wingless, and may be tan to grayish-white or even have a reddish tinge. Adult females may live up to 30 days on the head of the infested person. As with nymphs, they feed once or more often each day. Lice are unable to survive longer than 1-2 days away from the human body and are unable to live on pets.

The adult head louse

A nit - an egg glued to a single strand of hair.

Signs, Symptoms, and Transmission

Students with head lice are usually asymptomatic, but some may experience itching from an allergic reaction to the bites or irritation from sores caused by bites. Transmission occurs from head to head contact with an infested person. The transmission from hats, combs, pillows, etc. is possible but much less likely.

Reasons for chronic infestations

- Misdiagnosis
- Non-compliance
- Resistance to treatment (Lice on children who are treated repeatedly are more likely to be resistant to treatment.)
- New infestations
- Ineffectiveness of treatment

Diagnosis

Head lice may be found anywhere on the head hair, but are often easiest to locate on the scalp behind the ears and near the neckline at the back of the neck. Adult female lice deposit nits on the hair about 1 mm from the scalp. Under good lighting and using a comb, search the head for viable nits and crawling lice. Live lice are sometimes difficult to see as they move quickly and there are usually less than 10 lice on a head. Tape the live louse on a white background and view with magnification to see it more clearly.

Treatment

Treatment is recommended only for individuals found with live lice or viable eggs. If nits are found further than about ¼ inch from the head, they are probably hatched and no longer viable.

- **Nit Combs.** Combing with a nit comb can sometimes be effective in removing viable nits and lice. Nits that are more than ¼ inch from the scalp are not likely to be viable and need not be removed. Comb daily until no live lice are discovered for two weeks. Recheck in 2-3 weeks after you think all lice are gone.
- **Over the counter lice shampoo**. As with all drugs, directions must be followed exactly. These products may be rinsed from the hair over a sink rather than shower or bath to limit exposure to the body. A second treatment may be required in about 10 days.
- **Prescription lice shampoo medications.** These products contain other insecticides that require greater care for treatments, and should be used only under a physician's care, and only if live lice persist following treatment with the over-the-counter products. Parents should be advised to discuss with their health care provider specific instructions for use of these products, potential risks and benefits, and other possible treatment recommendations.

  Alternative treatments (petroleum jelly, mayonnaise, margarine, herbal oils, enzyme-based products and olive oil) should be avoided as there is no conclusive evidence that these treatments are effective or necessarily safe. Oils may facilitate the absorption of insecticides in shampoos.

Family members of a student with head lice should be encouraged to inspect themselves to see if lice are present. All individuals found with lice should be treated simultaneously. Inform family members that bedding, towels, nightclothes, and other clothing that was in contact with the head within a day of treatment should be washed and/or dried in the dryer at high heat (if appropriate). Combs, brushes, and hair accessories used by the student should be rinsed in hot water each day until lice are eliminated.

Do not treat the premises with pesticides! Treating rooms, carpets, desks, etc. is not recommemded. Vacuuming floors, especially carpets recently occupied by infested persons are recommended. Lice will soon die (generally within two days) once off the head for a day. Nits attached to hair that have fallen from an infected person will likely stop developing and will also die within a few days. Although it is not necessary to thoroughly clean school busses, vacuuming floors of classrooms or homes occupied by infected persons will help dispel concerns about lice or eggs that may have dropped from an infected person. Clothing, pillows, cloth toys, and other items that may have been used by infested children may be treated by heating in a clothes dryer on high heat or by sealing in a plastic bag for two weeks.

Recommendations for School Policy

- Routine head check of healthy students is not recommended.
- Check symptomatic students.
- When nits ¼ inch or closer to the scalp or live lice are discovered, do not exclude from school, but notify the parent that day and provide instructions on how to treat and eliminate.
- The school nurse may offer extra help to families with chronic infestations.

The American Academy of Pediatrics recommends that no healthy child be excluded from or allowed to miss school because of head lice, and discourages 'no nit' policies for return to school.

The National Association of School Nurses state that nit-free policies disrupt the education process and should not be viewed as an essential strategy in the management of head lice.

Health and Health Care in Schools. Children with nits do not pose an immediate threat to the health of others; therefore, excluding these children from school and requiring them to be treated with a pesticidal product is probably excessive.

Head Lice References

Lice Infestation. Centers for Disease Control and Prevention: <http://www.cdc.gov/ncidod/dpd/parasites/headlice/default.htm>.

Maine Coordinating School Health Programs: <http://www.mainecshp.com/>.

Pollack, R. J. **Head Lice Information and Frequently Asked Questions**. Harvard School of Public Health. <http://www.hsph.harvard.edu/headlice.html>.

Pediculosis - Head Lice. 2002. **Maine Department of Education School Health Manual**. <http://www.maine.gov/education/sh/headlice06.rtf>.

Pediculosis in the School Community. 2004. National Association of School Nurses <http://www.nasn.org/Default.aspx?tabid=237>.

Scherer, C. & P. Koehler. **School IPM - Biology and Control of Head Lice**. <http://schoolipm.ifas.ufl.edu/tp2.htm>.

School IPM Fact Sheet

Cockroaches

Cockroaches can be common pests in schools. By contaminating human food with feces and saliva, cockroaches may vector food-borne illnesses like salmonella. Cockroaches are also known to trigger asthma attacks.

Cockroaches are flattened insects with long antennae. Their colors may vary but are usually brownish. Immatures (or nymphs) look like the adults but are smaller and have no wings. Nymphs and adults have similar habits and behaviors.

They are usually found in dark, warm, moist environments; in protected areas like cracks and crevices in walls; cluttered environments; and near drains and leaking pipes. They are active at night where food is found, often in kitchens. Cockroaches are seldom found throughout an entire building, but tend to concentrate themselves in areas where water and food resources are readily available.

Prevention

Sanitation and maintenance provide the only permanent solution to cockroach infestations.

- Inspect food shipments immediately upon delivery.
- If possible, unpack cardboard boxes at or near the delivery area (or loading dock) rather than in the kitchen. Take cardboard boxes offsite, or at least out of the kitchen and pantry.
- Remove water sources by repairing dripping pipes or leaky faucets.
- Seal holes, cracks, and crevices in areas where cockroaches are found.
- Store food in sealed containers (not cardboard boxes), off the floor, in clean dry areas.
- Always keep areas where food is handled clean. Regularly mop, vacuum, sweep, or scrub areas where food is handled and eaten.
- Remove all garbage promptly from inside the school.
- Rinse out returnables and store in designated lined, non-absorbant, washable (plastic or metal) bins. Take them off-site at least weekly. Clean bins weekly.
- Clean all recyclable materials and store outside the school if possible.
- Keep clutter to a minimum.
- Limit eating to designated areas of the building.
- When food is eaten and/or stored in classrooms (even small candies or pet food), rugs, and floors, cupboards, desks, and classroom cubbies should be cleaned daily.

American cockroach

German cockroach

Brown-banded cockroach

Cockroach Egg

Monitoring

- Monitor areas where food, water, warmth, and protection are readily available: sinks, drains, vents, computers, leaky pipes, appliances, food-handling areas, air conditioning units, snack dispensers, dishwashing areas, trash receptacles, recycling and returnable bins, bathrooms, and storage areas.
- Monitor crawling insect activity (expecially cockroaches) by using sticky traps placed at regular intervals, about every 10 to 15 feet.
- Cockroaches normally use vertical surfaces as guides while they move from place to place, so place traps along baseboards, against the sides of freestanding objects, and in suspended ceilings. Traps must open parallel to walls, baseboards, etc. Traps set in the open away from walls or edges are unlikely to catch cockroaches.
- Avoid extremely dusty areas that decrease the stickiness of the trap.
- Number and date the traps and mark their position on a map of the school building.
- Check traps weekly. If a single cockroach is found, check traps daily until no more cockroaches are found in traps for about a week. Record the number of cockroaches caught in each trap in the IPM logbook. Remove or mark counted cockroaches or replace sticky cards at each count.

Management

In any area where cockroaches are detected, use increased sanitation and maintenance to eliminate sources of food, water, and shelter available to cockroaches. If this is not be enough to control an infestation chemical pesticides may be needed. Several least-toxic pesticides are available but pesticides may only be applied by persons with a commercial applicator license. *Discuss the following options with your licensed applicator.*

- Cockroach bait is the most common form of chemical management. Baits include a pesticide combined with a food source. Baits allow precise placement making them available to cockroaches with no interference to people.
- For optimum control, have a licensed applicator place baits as close as possible to an infestation. A small amount of bait in several strategic places is more effective than large amounts of bait in only a few places.
- Place baits along edges, in cracks and crevices, and between hiding places and foraging sites.
- To minimize the potential of pesticide exposure, use baits that are packaged in plastic stations.
- Map the location of all baits and check them regularly to make sure they are still present and are being eaten by cockroaches.
- Do not use other types of pesticides around the bait stations (e.g., sprays or dusts). The pesticides may act as a repellent, driving the cockroaches away from the bait.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Public Notifications in Schools".

Cockroach References

Integrated Pest Management for Northeast Schools. 2002. Hollinsworth et al (eds.). Natural Resource, Agriculture, and Engineering Service. NRAES-33. p.28-33.

Daar, S., T. Drlik, H. Olkowski, & W. Olkowski. 1999. **Integrated Pest Management for Schools: A How-to Manual**. EPA Region 9. <http://www.epa.gov/pesticides/ipm/schoolipm/>.

School IPM Fact Sheet

Managing Ants

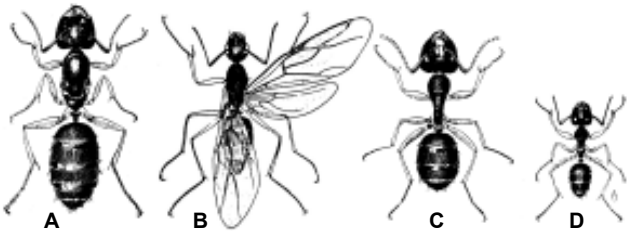
Ants are often considered pests in schools because they are unwelcome visitors inside buildings. Since most ants do not pose a serious threat to human health or property, take a common sense approach to managing them. Some schools have adopted a tolerance policy (except for carpenter ants) that emphasizes prevention and monitoring and relies primarily on mopping or vacuuming to remove the ants that invaribly find their way inside schools.

Indoor infestations are best treated or, better yet, prevented by practicing good sanitation and maintenance to keep ants from wandering indoors in search of food and water. It is usually not advisable nor effective to apply pesticides to floors or baseboards indoors or as a perimeter treatment outdoors. Preventative measures include the following.

- Clean up food and drink spills promptly.
- Keep pet and human food in pest-proof containers.
- Empty trash frequently.
- Rinse and store recyclable and returnable cans and bottles in pest-proof containers.
- Keep trees, shrubs, and mulch at least 12 inches away from buildings.
- Keep grass growing next to building mowed low.
- Repair leaks and condensation problems promptly.
- Seal cracks and keep screens, weather-stripping, door sweeps in good repair.
- Clean gutters.

Carpenter ants may cause considerable damage to wooden structures and should be eliminated when found in buildings. They are usually black and tend to be somewhat large (up to 1/2" long). Carpenter ants are often encountered in trees, stumps, and rotting logs outdoors but will come into schools buildings in search of food, water, and nesting sites.

- Inspect trees and stumps near buildings at night for carpenter ant activity.
- Infested stumps and trees located near building should be removed.
- Nests in buildings are usually associated with moisture problems such as roof or plumbing leaks. Inspect attics, window sills and frames, porches, around sinks and dishwashers, and foundation and sills to detect and repair leaks or condensation problems. Small piles of wood particles and/or dead ants found near any of these areas are an indication of carpenter ant nesting activity.
- The key to eliminating carpenter ants is to locate and remove (or treat) the nest. This is usually a job for a professional exterminator.



Carpenter ants: A, queen (winged when young), B, male, C, major worker, D, minor worker.

Nuisance ants that can often be managed with sanitation and pest-proofing

Cornfield ants feed on flower nectar, insects—dead or alive, and honeydew secreted from aphids. These ants often collect and transport aphids. Nests are commonly found in fields, lawns, between bricks in walkways, beneath rocks, in pavement cracks, etc. Workers are about $^{1}/_{10}$-$^{1}/_{4}$ inch long, light to dark brown, soft-bodied, and robust. When crushed, they emit a strong odor of formic acid. Numerous mounds can be common in turf where they ruin the surfaces of lawns, dull mower blades, and may suffocate the underlying turf.

Pavement ants may forage in buildings throughout the year, feeding on grease, meat, live and dead insects, honeydew, roots of plants, and planted seeds. These are very common ants usually found outdoors under stones, in pavement cracks, under slab foundations, along the curb edges, and in crevices of masonry and woodwork. Workers are sluggish, between $^{1}/_{12}$ -$^{1}/_{4}$ inch long. They are hairy, light to dark brown or blackish, with pale legs and antennae. The head and thorax are furrowed with parallel grooves running top to bottom. In winter, nests are often moved indoors near a heat source.

Lawn ants are general scavengers. They may also tend aphids and collect nectar when available. They nest under walks or stones, in turf, and on trees. In well-drained, clay or gravelly soil they make the well-known small ant hills with a central entrance. Workers are about $^{1}/_{4}$ inch long, yellowish, and occur in turf. The abdomen is light tan with brown bands. The head, thorax, and legs are slightly darker.

Little black ants feed on sweets, meats, vegetables, honeydew, and insects. They nest in woodwork, masonry, soil, and rotted wood. Nests in the ground have very small craters of fine soil surrounding the entrance. Workers are slow moving, about 1/8 inch long, slender, shiny black or sometimes dark brown.

All ants can bite when disturbed; therefore, ant nests sometimes present a hazard to children on playgrounds. For ant nests found on school grounds where children are at risk from bites, the following method can be used.

- Mix a solution of soapy water (3-4 tablespoons of liquid dish soap/gallon water) in 5-gallon plastic buckets.
- Standing a foot away from the nest (wear long pants or coveralls and tuck pant legs into socks to avoid ant bites), slowly pour soapy water into the nest. Have a partner poke holes in the nest with a stick and continue pouring water in. Continue using the stick to open the mound and pour more soapy water until no more live ants are seen.
- Excavate the nest with a shovel and pour more soapy water into depression.

European red ants (also called Eurpopean fire ants) are found in some mostly coastal areas including Mount Desert Island and Cape Elizabeth. They do not usually enter buildings but prefer moist soil in meadows, lawns, and gardens where they build wide, shallow nests often under bark mulch or wood chips. Workers are about 1/4 inch long, yellow to yellowish brown. This species can be aggressive and can inflict a painful sting that may cause allergic reactions.

Pesticide treatment by a licensed applicator can provide short term control, but can also result in resurgence of the problem. Effective alternative management strategies are under development for this pest. Contact the University of Maine Cooperative Extension's Pest Management Office for any control tactics (see box below).

Anyone making pesticide applications on school property must be licendes by the board of pesticides control. See "Standards for Pesticide Applications and Public Notifications in Schools".

Resources for Managing Ants

Groden, E., F. Drummond, & L. Stack. 2004. **European Fire Ant: A New Invasive Insect in Maine.** Bulletin #2550. University of Maine Cooperative Extension. <http://www.umext.maine.edu/onlinepubs/htmpubs/2550.htm>.

University of Maine Cooperative Extension Pest Management Office: Telephone: 207-581-3880; Web site: <http//:www.umext.maine.edu/topics/pest.htm>.

School IPM Fact Sheet

Managing Rodents

The most persistent rodent pests in schools are the house mouse, roof rat, and Norway rat. White-footed, deer mice, and voles (meadow mice) may also be troublesome. Rodents damage stored items, consume and contaminate food, and serve as reservoirs of several diseases. Most rodent problems can be prevented with landscape maintenance, good sanitation, pest-proofing, and monitoring with traps to catch them before they become an invasive pest. Rodenticides are not generally recommended except to reduce very high populations. Rodenticides may only be used in locked bait boxes serviced by a licensed applicator.

Monitoring, sanitation, and landscaping

- Inspect for evidence of rodents—droppings, gnawed food packages, greasy rub marks along walls.
- Use a flashlight to check behind and under equipment, furniture, sleeves, etc. especially where food is stored or eaten, including classrooms, teachers rooms, kitchens, cafeterias, and pantries.
- Inspect the grounds for food sources. Remove edible plants, fallen fruit and nuts, and animal feces.
- Use snap traps, glue boards, or other non-poisonous rodent traps to monitor rodent activity.
- Keep lids on trash cans and close dumpsters at night. Cover the drainage holes in dumpsters with wire mesh to keep rodents out. Locate dumpsters as far from buildings as possible.
- Remove debris, lumber piles, firewood, trash, and discarded items to reduce shelter for rodents.
- Trim vegetation at least 3 feet from buildings to decrease cover for runways and prevent hidden access.
- Break up long stretches of dense vegetation that allows rodents to travel long distances under cover.
- Keep grass and weeds mowed.
- Avoid planting ornamentals favored by rodents such as euonymus, nut and fruit bearing plants, etc. Contact Cooperative Extension for planting recommendations.

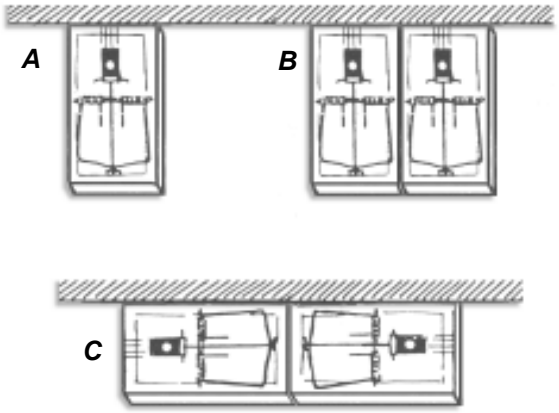
Rodent proofing

Rodent proofing involves tightening a structure to exclude rodents. A young rat can squeeze through an opening as small as 1/2 inch; 1/4 inch will admit a mouse. Inspect and seal doors, door sweeps, weather-stripping, cracks, gaps, and other openings where rodents may enter a building.

Traps

Traps are essential for monitoring rodent activity. School staff do not need a license to use mechanical traps for rodent control. Traps also avoid the odor problem from rodents that die in inaccessible places.

Rodents prefer to run along edges and they routinely follow the same runways. Identify runways by sprinkling a fine layer of flour or baby powder in suspected areas to observe tracks. Place traps along walls and runways, 6-10 feet apart. Take advantage of



Place snap traps in secure areas, along a wall or rodent runway. A) trap triggers should face a wall. B) two traps next to each other increases the chance of success. C) two traps may also be placed in line, the triggers to the outside.

fixtures that might guide them into the trap. Roof rats and Norway rats usually fear newly placed items and avoid them for several days. Keep all rat traps in place for at least 1 week before moving them. Traps should be checked daily. Traps and other surfaces contaminated with rodent urine or feces should be properly disinfected or disposed of.

Non-poisonous baits. The bait depends on the rodent. House mice and deer mice prefer peanut butter, gum drops stuck to the trigger, or rolled oats or bird seed sprinkled on the trap. When food is abundant, nesting material, such as a cotton ball tied to the trigger, can be effective. Roof rats prefer peanut butter, pieces of fruit, or shelled nuts. Norway rats prefer raw or cooked meat, fish (sardines are excellent), or peanut butter. Voles may be attracted using peanut butter, oatmeal, or apple slices.

Snap traps. Both the classic wooden trap and the newer pinch-designs kill trapped animals quickly. Traps should be placed in locked rooms or other areas not accessible to children or in locked, tamper-resistant containers securely attached to a surface so that the container cannot be moved.

Live traps. Several types of live traps are available. Some catch a single rodent, others reset themselves to capture several. The traps may be expensive and the live animals must be disposed of—living rodents should not be released into the wild. Regularly check live traps to avoid odor problems. Because rodents often die of dehydration in live traps, animal welfare experts consider snap traps more humane.

Glue boards are most effective against juvenile mice in dry, dust free areas. Captured rats can often pull themselves free. Fix glue boards to ledges, pipes, or rafters. Do not set them near open flames, above carpet, or where children and pets can contact them. Although they are not toxic, an encounter with a glue board can create a frustrating mess. Clean hands with room-temperature cooking oil. Clean hard surfaces with paint thinner or mineral spirits.

Chemical control

In situations where trapping and pest-proofing do not resolve rodent problems, anticoagulant poison baits are usually effective. Because rodenticides may be highly toxic to humans, they should only be used in secure locations and contained in tamper-resistant bait boxes. As with all pesticides, it is a violation of state law for unlicensed persons to use rodent poisons in schools. Be sure your pest control professional adheres to the following guidelines for using rodent poisons.

- Use rodent bait stations that are locked and firmly anchored.
- Place bait stations in areas inaccessible to children.
- Place rodenticides in the baffle-protected feeding chamber of the box. Never place bait in the runway.
- Monitor and service bait stations regularly; remove promptly when rodents are no longer using them.
- Ask your licensed applicator to provide a map showing locations of all traps and dates of service.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Public Notifications in Schools".

House mice are the most common rodents found in schools. They are inquisitive, good climbers, and actively explore anything new. House mice are gray-brown with a lighter belly and small, black eyes. House mice feed primarily on seeds, grain products, and dried foods. They are nocturnal and secretive and tend to nibble on many small meals each night. They have a small home range, usually staying within 10-30 feet of their nest. Nests usually are built in structural voids, undisturbed storage or debris, or in outdoor burrows. The presence of mice is usually indicated by actual sightings, damage caused by gnawing into food containers, or the presence of droppings.

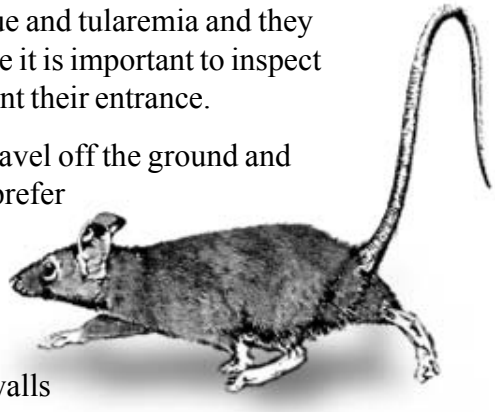
White-footed and deer mice have white feet, usually white undersides, and brownish upper surfaces. They have larger eyes and ears than house mice and most people find them more "attractive." These mice are seed eaters. They also consume fruits, insects, fungi, and possibly some green vegetation. They are uncommon in urban or suburban areas unless there is considerable open space nearby. They are mostly nocturnal with a home range of 1/3 to 4 acres. The signs they leave are similar to those of house mice, although white-footed and deer mice have a greater tendency to cache food supplies. They also lack the characteristic mousy odor of house mice. They will enter structures where they can cause considerable damage to materials that they use for nest building. White-footed mice may harbor hantavirus.

Voles, also called meadow mice or field mice, are compact rodents with stocky bodies, short legs, and short tails. They prefer wet meadows and grassland habitats and eat a wide variety of plants. Their home range is variable but usually 1/4 acre or less. Voles do not hibernate, they are active day and night, year round. Large population fluctuations generally peak every 2 to 5 years but the cycles are not predictable. During population eruptions, extremely high population densities may be reached.

Voles create an extensive system of surface runways 1-2 inches in width with numerous burrow openings. A single burrow system may contain several adults and young. Vegetation near well-traveled runways may be clipped close to the ground. Feces and small pieces of vegetation are found in the runways. During winter the only evidence of activity in and around buildings may be odors associated with droppings and urine in the walls. The droppings can be abundant and moist, unlike dry pellets produced by other rodents. They can also be quite active in greenhouses where they will eat plants.

Voles are capable of carrying disease organisms, such as plague and tularemia and they sometimes inhabit and defecate in the walls of buildings. Therefore it is important to inspect building perimeters in the fall and make necessary repairs to prevent their entrance.

Roof rats, or black rats, are excellent climbers. They like to travel off the ground and enter buildings from nearby trees or along power lines. Roof rats prefer fruit, but will eat any type of food. They have a large home range and may travel more than 50 yards to reach food or water. They often nest in attics, wall voids, and hollow trees. The presence of roof rats is determined by gnawing damage, droppings, sightings, sounds of scratching, squeaking, or gnawing in walls or ceilings, and characteristic dark, greasy rub marks along frequented paths along walls and rafters.



Norway rats are strong burrowers, good climbers, and excellent swimmers. They are more common in sewers and buildings than the roof rat. They strongly prefer meat and fish, but will do well on any type of human or pet food. Their home range may be more than 50 yards in radius. These rats usually dig burrows along building foundations and under debris piles. The Norway rat is very aggressive and may drive roof rats out of an area or they may share a building: Norway rats in the basement and roof rats in the attic. The signs they leave are similar to those of roof rats.

School IPM Fact Sheet

Yellowjackets, Hornets, and Bees

Stinging insects present a special hazard in schools due to the danger of allergic reactions in some people. Wasp stings are painful for most of us, but every year in the U.S. as many as 40 allergic individuals die from yellow jacket stings. Inspection, sanitation, exclusion, and the removal of small nests in early summer are the best methods for reducing wasp populations. Wasp colonies are killed by freezing temperatures in fall and winter and their nests are not reused the following season.

Inspection

From May to October, monitor for wasp nests every 2 weeks. Paper wasp nests are fairly easy to spot on the eaves of buildings or playground equipment. Yellowjacket nests are more difficult to locate especially if they are enclosed in wall voids or underground. These nests may remain hidden until they are quite large.

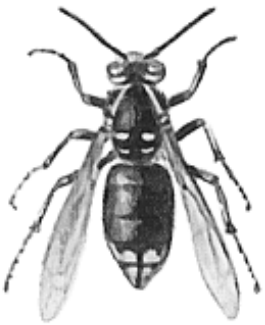
Yellowjackets will nest in the ground (often under shrubs, logs, or rock piles); in hollow trees; among branches of trees or shrubs; under eaves; in hollow fencing, playground structures, and meter boxes; and inside walls. Look for wasps entering and exiting from one of these locations.

Nests located where they can be avoided do not need to be treated. Rope off areas where nests are located, if possible, and instruct children not to disturb nests.

Outdoor sanitation

As summer wanes and natural food sources become scarce, dumpsters become very attractive to wasps. Practice good sanitation to keep foraging wasps away from food wastes.

- Make sure all trash containers have tight-fitting lids or spring loaded doors.
- Place all waste into sealed plastic bags before disposal.
- Empty trash frequently, especially during warm months.
- Wash dumpsters on a regular basis to eliminate spilled food and liquids.
- Limit food consumption outdoors. Clean up and dispose of trash promptly after outdoor events where food was served.
- Goldenrod is a major source of sugar for yellow jackets. If a nearby field of blooming goldenrod is mowed, expect an increase in the number foraging yellow jackets around school buildings and playgrounds.



Baldfaced Wasp

Yellowjacket

Paper Wasp

Exclusion

To prevent wasps from building nests, use quality sealant, steel wool, and insect screening to close openings in outside walls, playground structures, fences, pipes, hollow fence posts, meter boxes, wall voids, etc. Do not seal the entrance to an active nest until the colony is destroyed.

Removing nests

Nests should be removed if they are located in areas where disturbance is inevitable or where there is a persistent problem on athletic fields or around outdoor food-service areas. By managing wasps early in summer, schools can avoid larger, late-season nests that pose a real threat.

Knock down small paper wasp nests using a directed spray of water or a pole. Yellowjacket nests are often difficult to locate and remove. Nests found in shrubs should be bagged, then cut out. For ground nests, vacuuming the nest opening can work well, however digging a nest out of the ground is labor intensive and dangerous.

To avoid the risk of stings to students and staff, hire a professional to remove nests. Experienced professionals can vacuum nests located indoors or in sensitive areas where pesticides should not be used.

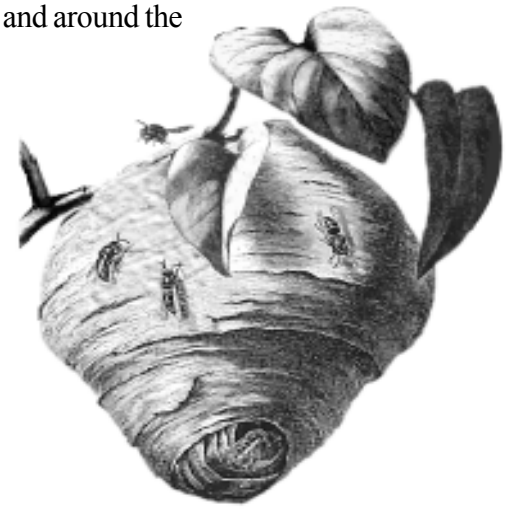
Using pesticides

Large paper wasp nests and those in hard to reach locations require a low-toxic spray containing pyrethrin, mint oil, or eugenol. The pesticide treatment kills wasps at the nest as well as the foraging workers who will rebuild the nest on their return. Maine law permits a non-licensed school employee to apply ready-to-use general use pesticides by hand or with non-powered equipment to control stinging or biting insects for protection of school occupants. However, to avoid the risk of stings, you may wish to hire a professional to treat the nests. Treating the entire building exterior is not necessary or recommended. Use the following procedures to treat the nest with a registered insecticide:

Treating above-ground nests

- Wear protective clothing (coveralls with long sleeves tucked into gloves, pants, boots, a veil, and hat) to avoid stings.
- Treat at night when the entire colony is in the nest. Use an aerosol product—formulations designed to apply a 10-15' stream are effective.
- Approach the nest close enough to spray directly into and around the edges of the entrance hole.

Umbrella or paper wasp nest



Yellowjacket nest

Treating underground nests

- Wear protective clothing and veil to avoid stings.
- During the day, mark main entrance then check for and mark any additional entrances located within 40-50' of the main entrance.
- After dark, use a ½-second blast of aerosol spray to kill guard wasps at secondary entrance, stuff hole with paper, cover with soil. Apply some of the spray to the main entrance to kill guards, then use a bulb applicator to puff a dust formulation into the nest. Seal the entrance with moist soil.
- *Do not use gasoline or fuel oil for treatment.* It is illegal, ineffective, and pollutes the soil and ground water.

Treating nests in wall voids

- Wasp colonies can be eliminated using the same procedure for ground nests.
- After killing and removing the colony, seal the entry way to prevent reinfestation.

Yellowjacket traps

Trapping may catch hundreds or even thousands of individual wasps and still have little impact on the number of wasps around the school yard. However, the attractants in jar traps can draw wasps away from sensitive areas. Place traps out of children's reach near dumpsters or other food sources. Do not place traps on playgrounds or areas that are not normally attractive to wasps. Empty traps when full by placing them in the freezer or in a black plastic bag placed in the sun for a day to kill trapped yellowjackets. Wash traps in soapy water and refresh the bait.

Bees

Bees are generally mild mannered and pose a threat only if handled. They are often found on clover, wild flowers, and ornamental plantings. Because of their importance as pollinators, it is not advisable to apply pesticides to lawns, athletic fields or ornamental plantings where bees are active. To avoid stings, do not allow children to walk bare footed in these areas.

Occasionally, honeybees will swarm to seek a new site for the growing colony. Because there is no nest to defend, bee swarms are usually docile if left alone. It is common for a swarm to rest for several hours or an entire day before flying off to a new nest site. However, swarms that have clustered in an area for several days may become defensive. If swarming bees have moved into a wall void or other opening, they will defend themselves when disturbed.

Schools that experience swarming bees can call the Division of Plant Industry, 207-287-3891. The Division maintains a Swarm List of beekeepers who are willing to retrieve swarms. If the bees present an unacceptable threat, call the local fire department; they will exterminate the swarm.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Public Notifications in Schools".

School IPM Fact Sheet

Managing Tree Squirrels

Tree squirrels are occasional pests in urban areas including school buildings. In Maine, there are two species of concern. **Gray squirrels** are gray on the top with a white underside. They measure 16 to 20 inches long; nearly half this length is the tail. **Red squirrels** are smaller but more agile, alert, and noisy than the grays. They are rusty-brown on top, turning grayer during winter, and off-white below. Red squirrels measure about 12 inches from nose to tail. They are strongly territorial and defend their food sources and den trees against intruders.

Tree squirrels feed on a variety of material including nuts, fruit, seeds, berries, insects, and bark. They nest in tree cavities, old woodpecker holes, attics, etc. If these sites are unavailable they may construct leafy nests in the branches of trees.

Damage

Squirrels typically gain entrance to attics and other structures from the roof, usually where tree limbs overhang the roofline. They may enter through damaged or unscreened vents although they sometimes gnaw their way into an attic. The sound of running or gnawing in walls or the ceiling during the day often indicates the presence of squirrels. Similar sounds at night usually indicate the presence of rats or mice. Squirrels can cause extensive damage to the insulation in the attic or walls, and may gnaw and damage wiring creating the risk of electrical fires. During winter, tree squirrels may damage trees and other ornamental plants by eating the bark off the limbs.

Management Methods

- Trim all tree limbs back at least 8 to 10 feet from roofs. If this is not possible, discourage climbing by fastening a 2-foot band of sheet metal around the trunk 6 to 8 feet above ground.
- All openings attics, vents, overhanging eaves, and siding must be sealed to exclude squirrels.
- Sheet metal, hardware cloth, and steel wool are effective materials for sealing the openings.
- Openings should not be repaired until the squirrels are out of the building. Usually a one-way door is used to allow squirrels to leave the building and not re-enter.
- Seal openings where utility cables or pipes enter buildings.
- Install chimney caps on all chimneys and check for gaps in the flashing at the chimney base.
- Live traps can be used to reduce local squirrel populations or to remove individual squirrels from a building interior. Effective baits include fruit, peanut butter, nuts, seeds and vanilla extract.

For more information, contact your local Animal Damage Control Office or one of the following Regional Warden Service Offices:

Ashland	**800-624-2512**	**or 207-435-3231**	**Greenville**	**800-624-2538**	**or 207-695-3756**
Bangor	**800-624-2498**	**or 207-941-4440**	**Sidney**	**800-292-7436**	**or 207-547-4145**
Gray	**800-295-2435**	**or 207-657-2345**			

School IPM Fact Sheet

Managing Flies

Filth flies

House flies, blue and green bottle flies, and flesh flies breed in garbage and/or animal feces and are generally referred to as filth flies. They pass through four distinct stages in their life cycle: egg, larva (maggot), pupa, and adult. These flies can detect odors across long distances. Smells of souring milk from hundreds of containers thrown in dumpsters can attract thousands of flies from the surrounding neighborhood. Sanitation is the key to preventing fly problems.

House flies. House flies are the most common fly in and around schools. The adults are $^1/_8$-$^1/_4$ inch long, and dull gray. Females lay eggs in organic material, such as garbage or decaying vegetation that has sufficient food for developing maggots. After emerging as adults, flies range 1-2 miles; some may travel as far as 20 miles. Their behaviors make them annoying—they enter buildings, hover around people, and crawl on food. They also leave fecal spots, or "specks," where they have walked, and may transfer human and animal diseases.

Blow flies—greenbottle and bluebottle flies. These flies are similar in size to house flies, but are metallic blue or green. Adults make a loud, droning buzz. They breed in dead animals, feces, and garbage. They are stronger fliers than the house fly; flight range is 3-10 miles. If a large number of these flies is found indoors, there is probably a dead animal nearby. Green bottle flies are commonly seen on animal feces outdoors.

Flesh flies. Flesh flies are 2-3 times larger than house flies (over $^1/_3$-inch long), gray with 3 dark stripes on the body, a gray and black checkerboard pattern on the abdomen, and red eyes. Most species of flesh flies are scavengers and breed in garbage, manure, or animal carcasses. A few species are parasites of caterpillars and considered beneficial insects. Flesh flies are common in populated areas but seldom enter buildings in large numbers.

Managing filth flies

Permanent or long-term control involves locating and eliminating larval breeding sites through improved maintenance and sanitation.

Sanitation and maintenance

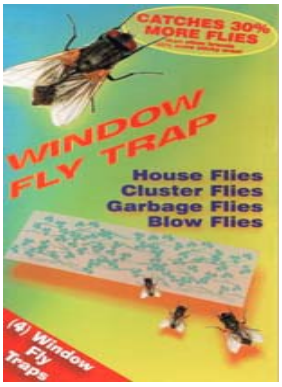
- Keep doors and unscreened windows closed. Install air curtain over doors that must remain open for extended periods of time.
- Make sure window and door screens are in good repair.
- Promptly fix drains or electric garbage disposal units that leak, or drains that allow food waste to accumulate under sinks or floors. Leaky drains can attract many species of flies. Remove any food waste that has accumulated under sinks or floors; or in crawl spaces or basements at the site of a broken drain, and then clean the area thoroughly.
- All food waste from the kitchen, cafeteria, and other areas should be separated from other garbage, drained so that it will be as dry as possible, and then stored in sealed plastic bags before disposal.
- Seal containers with small amounts of food waste, such as milk or yogurt cartons, in plastic bags before disposal.
- Staff should be trained to place, not toss, bags of garbage into dumpsters to avoid breaking the bags open and spilling garage into and around the dumpster.
- In food preparation areas, rinse all cans, bottles, and plastic containers before recycling or discarding.
- Inform students, teachers, and staff about the importance of placing garbage inside the proper containers. Garbage should never be left lying on the ground.
- Promptly remove animal waste or dead animals found on school ground.
- To avoid attracting flies into the building, place dumpsters and recycling containers upwind from the outside doors of the school, particularly doors to the kitchen or cafeteria.
- Garbage cans on the school grounds should have removable domed tops with self-closing, spring-loaded swinging doors. Line cans with plastic bags that can be tightly sealed and removed daily.
- Make sure garbage can and dumpster lids close tightly and remain closed when not in use. Repair or replace dumpsters and garbage cans that have holes or lids that do not close tightly.
- Inspect dumpsters and other outdoor trash receptacles daily and remove any wastes lying on the ground.
- Wastes should be collected and moved off-site at least once a week. Since flies breed faster in warm weather, garbage removal twice a week may significantly reduce fly problems.
- Regularly clean garbage cans and dumpsters to prevent the buildup of food waste. If possible, dumpsters should be fitted with drains so that they can be hosed or scrubbed out as needed. Use a high-pressure stream of water or a brush and soapy water. A solution of borax and water will eliminate odors that attract flies. Some pest management companies will power-wash dumpster and dumpster areas as part of their service. You may need to require your sanitation company to clean the dumpster or replace it with a clean one more frequently.
- Flies can develop in soil that was soaked with water used to clean garbage cans and dumpsters. Check these areas regularly. If you see maggots, scrape them up along with the soil and dispose of everything in a tightly sealed plastic bag.
- Manage compost bins properly to avoid fly problems.

Fly traps

Adult flies can be captured with attractant fly traps or sticky fly tape. Traps can monitor the effectiveness of management programs and give moderate control in small, closed areas where fly populations are low. Electrocution type traps should not be used because these can disperse bacteria into the environment.

Commercially available indoor light traps that attract adult flies are often used in restaurants, grocery delis, and food processing plants. They should be placed on the wall 3-6 feet from the floor, away from windows and doors. These traps may be useful in school kitchens or cafeterias where an extra measure of control is needed, such as schools located adjacent to animal farms. Only use light traps with replaceable glue boards.

Attractant traps need to be serviced regularly, and repaired or replaced when damaged. Sticky traps should be hung where people do not inadvertently contact them. For some examples of commercially available fly traps see http://schoolipm.ifas.ufl.edu/tech_np.htm#3.



Fly traps are available in several designs. Traps need to be serviced regularly, and repaired or replaced when damaged.

Chemical control

Except for odor-eliminating chemicals (such as borax) and baits (placed only inside dumpsters), pesticides are not recommended for fly management.

Low concentrations of borax in water can be used to eliminate fly odors. This solution is particularly effective for removing fly specks from walls and eaves, and for rinsing out garbage cans and dumpsters. These solutions should not be used near ponds, streams, lakes, or other bodies of water, and should not be poured onto plants.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Public Notifications in Schools".

Fruit flies

These flies are commonly seen flying around ripe fruit, especially bananas. They are about 1/8 inch long. They lay their eggs near the surface of fermenting fruits and vegetables and other moist organic materials (including damp mops and cleaning rags, as well as residues in bottles, cans, garbage disposals, and drains). Their complete life cycle takes little more than a week, so the number of flies produced by a single piece of fruit is enormous. These flies are most often a problem in late summer and early fall; careful storage of fruit and vegetables is necessary at these times of the year.

Management

Fruit flies are most active from early summer through early fall. Problems with these flies can be avoided by ripening fruit in paper bags. Seal the bags by folding the top over several times and closing them with paper clips or clothespins. Once fruit is ripe, store it in the refrigerator.

If an infestation is discovered, find and remove the material that is breeding the flies. Begin with obvious sources, such as ripe fruit and vegetables; look at water seeping from refrigerators, humidifiers, or sink drains that may be fermenting; spoiled animal food; even damp, sour mops or rags. To check if the breeding source is located in a garbage disposal or drain, tape a clear plastic bag over the drain overnight. Emerging adults will be captured in the bag. Areas outside the building near windows and doors should be checked for rotting vegetable matter. All breeding sources should be removed and disposed of in a sealed plastic bag. Make sure that screens and windows near food preparation areas are in good repair.

Fruit fly trap

To make a simple trap for adult fruit flies, combine 1 cup of vinegar, 2 cups of water, and 1 tablespoon of honey in a 2-liter soda bottle. Replace the cap, shake the mixture well, and punch holes through the side of the bottle above the liquid so the flies can get in. String the bottle about 5 feet above the ground. Discard and replace the liquid as needed.

Cluster flies

Cluster flies are larger and darker than the common house fly. These flies parasitize earthworms during the summer months. Rich soil with many earthworms can support a large population of these flies. In the fall, the adults cluster on the sun-light south and west sides of buildings. As the weather gets cooler, these flies begin looking for sheltered places to spend the winter and often enter buildings through cracks and crevices.

Management

Cluster flies are not as strong fliers as house flies and can easily be killed with a fly swatter or removed with a vacuum. During warm winter periods, cluster flies in buildings become active and are attracted to windows. Opening the window and allowing them to exit is an easy control tactic for smaller infestations. Commercially available window traps can be helpful in capturing flies indoors.

Try to seal the building exterior before they find their way inside during fall. Common entryways include unscreened doors and windows, openings under siding and around roofs, unscreened ventilating spaces, cracks around windows, and holes where wires penetrate the walls of the building.

Phorid flies (humpbacked flies)

Common phorid flies are small, $^{1}/_{16}$ - $^{1}/_{8}$ inch long, with a yellowish-brown body and li brown wings. The adults seem reluctant to fly as they run around on walls, windows, and tables with a characteristic quick, jerky motion. The females are strongly attracted to odoı and lay their eggs on or next to decaying material including decomposing fruit, vegetables, and meat; open wounds in animals or people; and human and animal feces. The life cycle from egg to adult takes from 14-37 days.

Management

Although it may be difficult, it is important to find the breeding site. Once found, it must be thoroughly scraped, cleaned, and dried. Large infestations of these flies are often the result of broken drains or garbage disposals that allow organic matter to accumulate in out-of-the-way places such as wall voids, under floors, in basements, or in the soil of crawl spaces.

Moth flies (drain flies)

Moth flies are dark or grayish and fuzzy, about $^{1}/_{16}$ - $^{1}/_{4}$ inch long. Their body and wings are densely covered with hairs. Wings, appearing too large for the body, are held roof-like over the body at rest, giving this fly a mothlike appearance. During the day, adults often rest in shaded areas or on walls near plumbing fixtures and on the sides of showers and sinks. During the evening, these flies can be seen walking about drains and sinks. The maggotts can live in drain scum.

They may breed in large numbers at sewage filter plants and can be carried by prevailing winds to nearby buildings up to a mile away. Adults are small enough to pass through ordinary window screening.

Management

Moth flies do not bite humans but large numbers may become a nuisance. Infestations in drains often can be eliminated by flushing these areas with sink cleansers and very hot water. The most effective management tool is prevention. Regularly clean problem areas to remove the gelatinous, rotting organic matter that fly larvae feed on, including drains, sinks, wash basins, showers, dirty garbage containers, standing water in air conditioners, and other pools of stagnant water. Enzymatic cleaners and a long-handled brush are recommended for cleaning drains.

To monitor moth flies, place a glue board over a drain, sticky side down, on a collar made of cardboard. Leave in place overnight or for a few days to capture adult flies.

School IPM Fact Sheet

Mosquitoes

Although there are 45 identified species of mosquitoes in Maine, only about half of them are considered biting pests of humans and even fewer are sufficiently abundant to be considered important pests. Female mosquitoes feed on blood to acquire the extra protein they need to produce and lay eggs. In this process they can carry disease organisms and parasites from one animal to another. Eastern Equine Encephalitis and West Nile Virus are serious human diseases vectored by mosquitoes.

Habitats and life cycles

All mosquitoes breed in standing water. The majority of biting species live in the temporary spring pools formed by melting snow. Some species live in fresh water swamps, ponds, salt marshes, grassy ditches, culverts, and natural or artificial containers, such as tree holes, hollow stumps, rock holes, tires, swimming pools, and cans.

Eggs are deposited by females either individually or in groups on the surface of water or on soil where flooding will produce pools or ponds. In southern Maine, mosquitoes begin hatching in early to late March and continue until late April or early May, each species having a particular temperature range favorable for egg hatch. In central and western Maine, hatching occurs about 2 weeks later. At the Canadian border, mosquito eggs do not hatch until the last week of April. The larvae are called wrigglers because of their thrashing motion in the water. They breathe through a straw-like tube held at the water surface. The length of this life cycle varies by species from 4–30 days.

Adults begin emerging in late April. As long as water is available in their habitats, mosquitoes tend to gradually increase in abundance throughout the summer. Their numbers generally depend on the amount of rainfall. During wet summers, mosquitoes will be abundant; in dry summers, numbers will be low and individuals short-lived. Peak annoyance to humans usually occurs during the month of June.

Management

Eliminate breeding sites

Locate breeding sites before the adults emerge (late April). Drain or remove all stagnant water in unused buckets, pools, old tires, tin cans, and other discarded containers. Be sure gutters and downspouts are cleaned. Keep dumpsters and trash receptacles covered to prevent water accumulation. Drill holes in playground tires, if necessary, to prevent water accumulation.

Eliminate adult resting sites

Cut back or remove dense brush and other vegetation from around buildings. Keep grassy areas mowed. Manage landscapes to allow air movement to reduce mosquito problems.

Protect natural predators

Predators such as dragonflies provide some natural control of mosquitoes, especially in and around small ponds and salt marsh pools. However, importing dragonflies is not recommended. Bats and birds, often cited as important natural controls for mosquito populations. Consider putting up bat and bird houses.

Avoidance

- Avoid outdoor activity when mosquitoes are most active—at daybreak and dusk and on cloudy, warm days.
- Avoid areas where mosquitoes tend to concentrate—in tall grass, margins of wooded areas, or in heavily wooded areas in dense vegetation.
- Avoid wearing dark colors. Mosquitoes and other biting flies are attracted to dark greens, browns and black. They are less attracted to light colored clothing, especially whites, and yellows.
- Wear long sleeves and pants.
- Make sure window and door screens are in good repair.

Repellants

Schools may wish to adopt a policy for use of repellants. Some schools require parents to sign a consent for school staff to assist younger students in applying repellants provided by parents.

Repellants are pesticides, and although they are exempt from many pesticide regulations, care should be taken to avoid over-exposure. Insect repellents can repel mosquitoes for 2 or more hours depending on the ambient temperature, amount of perspiration, exposure to water, abrasive removal, etc. The CDC recommends the use of repellents containing the EPA registered active ingredients DEET, Picaradin, oil of lemon eucalyptus PMD), or IR3535. "Pure" oil of lemon eucalyptus (e.g. essential oil) is not registered and, therefore, not recommended. Oil of lemon eucalyptus should not be used on children under the age of three years. Concentrations containing 50% or more of any active ingredient do not significantly increase protection time.

Do not allow children to handle the product. Adults should first apply to own hands and then wipe it sparingly on the child, avoiding the child's hands. Apply repellants only to exposed skin and/or clothing (as directed on the product label). Do not apply to eyes, mouth, cuts, wounds, or irritated skin. When using sprays, spray first on the hands and then apply to the face, sparingly around ears. After returning indoors, thoroughly wash treated skin with soap. If use of repellent results in a rash or other bad reaction, immediately wash the repellent off and contact the local poison control center.

Questionable control methods

"Bug zappers" are commonly sold for mosquito control. Using an electrified grid and an ultraviolet light, they attract and kill any insect entering the trap. Unfortunately, the lights are not especially attractive to female mosquitoes who are more attracted to host odor. These devices generally kill more beneficial insects than pests. Light traps and carbon dioxide traps used by mosquito control programs are for monitoring purposes and are not effective in reducing mosquito numbers.

There have been several ultrasonic "mosquito repellers" on the market. The sound emitted by these devices is supposed to confuse mosquitoes and prevent biting. Tests under carefully controlled conditions have shown that these devices are totally useless for repelling mosquitoes.

Chemical control

There are several chemicals and formulations specialized for mosquito control. Chemical control is only a temporary solution to mosquito problems. Overuse of chemical pesticides can adversely affect nontarget organisms and can lead to pesticide resistant mosquito populations that are more difficult to control. However, if there are extensive mosquito breeding areas on school property, consider having a licensed operator apply a carefully chosen insecticide to the breeding areas to kill mosquito larvae. This method eliminates mosquitoes before they disperse and gives more effective, longer lasting control than applications that target adult mosquitoes. The population should be monitored to determine proper treatment timing. Larviciding should be used when mosquito egg hatch is complete, but before the larvae transform into pupae. Larvicides

will not affect eggs or pupae.

Use the least toxic materials to minimize contamination of aquatic environments and adverse effects to other organisms in the area. Note that any treatment of the surface waters of Maine requires a special permit issued by the Department of Environmental Protection.

Insecticide applications that target adults are the most expensive and least effective method of mosquito control and are not recommended for controlling mosquitoes on school grounds. This method will rapidly reduce mosquitoes in a local area, but the effect does not last long and applications must be repeated several times to keep mosquito populations low.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Notifications in Schools".

Resources for Managing Mosquitoes

Updated Information Regarding Insect Repellents. May 8, 2008. Center for Disease Control. http://www.cdc.gov/ncidod/dvbid/westnile/

School IPM Fact Sheet

Spiders

The general appearance of spiders is familiar to most. They are closely related to insects but spiders have eight legs; insects have only six. Spiders belong to a group of animals known as arachnids, which also includes mites, ticks, and harvestmen (daddy longlegs). Few organisms create as much hysteria as spiders; this fear is largely unwarranted. In fact, spiders are beneficial to humans because they help to control a wide variety of indoor and outdoor pests.

Wolf spiders hunt, day and night, and are often observed running on the ground.

In the U. S., four types of spiders are considered dangerous: the black widow, brown recluse (or violin) spider, the aggressive house (or hobo) spider, and the tarantula. Bites from these spiders can be painful, but they bite only when provoked or under certain circumstances. Poisonous spiders are rarely, if ever, found in Maine.

The common house spider hangs upside-down in their tangled web. Several egg sacs are often present.

Children may be especially sensitive to spider bites, but many bites blamed on spiders are more likely from fleas, bedbugs, mosquitoes, ticks, or mites. Most spiders are too small to have a dangerous amount of venom, or a bite that can penetrate skin, or too weak to harm humans.

Often found at windows, jumping spiders stalk their prey during the day. Their eyes accurately follow objects up to a foot away.

Management

Unwanted spiders, and their webs, can usually be removed simply by sweeping or vacuuming. In most cases this is sufficient. If more action is necessary, study the situation to locate the spider's source of prey. Are spiders thriving on night-flying insects that are attracted to security lights? Are insects being attracted by poor sanitation habits? Eliminating the food source for the insects will reduce the food source for the spiders.

Maintenance to reduce spiders includes:

- Moderate the use of exterior lighting. Use sodium vapor lights where possible.
- Position lights away from buildings rather than mounting them directly on the exterior.
- Vacuum adult spiders, webs, and egg sacs. Immediately empty bag to prevent their escape.
- Remove litter and clutter from the sides of buildings, keep all areas free of unneeded, unwanted items.
- Seal openings in outdoor structures, playground equipment, bleachers, fencing, outdoor furniture.
- Repair screens and fill cracks and crevices around windows, doors, and foundations.
- Use weather stripping around windows and doors.
- Eliminate moisture from crawl spaces.
- Prune plants 6 feet away from buildings.

Chemical control

Chemical control of spiders is rarely, if ever, needed, often ineffective, and is not recommended.

School IPM Fact Sheet

Ticks

Ticks are sometimes of concern on school properties, especially those species that can transmit serious diseases to humans such as Rocky Mountain spotted fever, Lyme disease, babesiosis, ehrlichiosis, and Powassan encephalitis. Approximately 12 species are considered to be of major public health or veterinary concern. Management practices unclude: a) personal protective measures (such as wearing appropriate clothing, avoiding habitats associated with ticks, and judicious use of insect repellents), b) landscape modifications, and c) if necessary, limited use of pesticides as a targeted barrier treatment.

Ticks are blood-feeding arthropods related to spiders and mites. The adult tick has eight legs compared to insects which have six legs. Ticks can feed on a variety of animals including birds, amphibians, reptiles, and mammals (including people). The primary habitats for ticks are wooded areas and the open or grassy areas at the edges of wooded areas. On school properties, ticks are most often found on playgrounds, athletic fields, cross-country trails, paths, and school yards located in and adjacent to wooded areas, especially where deer and other wildlife hosts are abundant.

As ticks go through their life stages (egg, larva, nymph, and adult), they usually change hosts. Young ticks will attach to small animals and be dispersed by them. Nymphs and adults will climb onto grasses, herbaceous plants, and shrubs which enables them to latch onto larger hosts. Adult ticks can perch on plants for months waiting for a host to come by.

On humans, ticks migrate around the hairline, the area behind the ears, or in the armpits. It takes five to six hours for a tick to become firmly attached and up to ten days for it to become fully engorged with blood. The female needs a bloodmeal in order to lay her eggs. Ticks have been known to survive for one year without a bloodmeal.

The deer tick (*Ixodes scapularis*), also known as the "black-legged tick", is a small tick found almost statewide, especially central and southern Maine. It is the principal vector of *Borrelia burgdorferi,* the Lyme disease spirochete (bacterium) in the northeastern United States. Ticks must remain attached to the host for at least 24 hours in order to infect the host. The early signs of the disease usually show up as a rash at the bite site followed by flu-like symptoms. Untreated cases may lead to arthritic conditions and possible neurological problems. Medical care should be sought when a person is bitten by a deer tick or exhibits Lyme disease symptoms.

For more information on deer ticks and Lyme disease, contact the Maine Center for Disease Control and Prevention (207 287-7267) or visit http://www.maine.gov/dhhs/boh/ddc/lyme_disease.htm.

The American dog tick (*Dermacenter variabilis*), also called the wood tick, is larger than a deer tick and the unengorged female has a whitish shield on its back. This tick readily attaches itself to humans and is one of the most commonly encountered ticks in Maine. Some dog ticks outside of Maine may carry the organsim that causes Rocky Mountain spotted fever, a serious disease that can be transmitted to humans. Symptoms of this disease are headache, fever, and aching muscles two to 14 days after

an encounter with a tick. Two to three days after the fever starts, a rash develops on the wrists and ankles, spreading to the palms, soles, and trunk of the body. There have been no known diseases transmitted by dog ticks in Maine.

Dog ticks are most likely to be found in open areas with tall grass or brush. Adults are first noticed in late April and remain abundant through June. Although numbers seem to decline sharply after that, ticks are present all summer.

Managing School Properties to Reduce Tick Problems

Landscape management practices designed to make the landscape more inhospitable to primary tick hosts may reduce a tick population. However, these practices alone will not eliminate all ticks and the risk of associated diseases. Therefore, other tick control practices must be integrated with the overall program to reduce the risk of disease. It is impractical and expensive to institute tick control measures and landscape management practices in all areas of the school grounds. Efforts should be focused on frequently used areas (playground, ball fields, area immediately surrounding the school building, etc.).

- Cut back vegetation and remove vegetative debris to reduce shade and moisture. Keep grass, weeds, and brush mowed short. Remove leaf litter and plant debris around buildings, edges of lawns, playgrounds, and ball fields. Compost or bag and remove leaf litter. Avoid use of ground cover vegetation in frequently used areas.
- Reduce cover for mice. Prune trees and shrubs. Clean up storage areas.
- Use hardscapes (pavement, stones, etc), mulches, and water-conserving landscape techniques.
- Maintain a three-foot wide or broader walkway of wood mulch or crushed stone to serve as a barrier between woods and lawns.
- Keep out stray dogs.
- Reduce deer habitat and install fencing as necessary.
- Move swing sets and playground area out and away from the woodland edge.

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Monitoring for Ticks

Tick populations can be monitored by dragging or flagging since ticks are usually found within 18" of the ground. A tick drag, made with a 3" x 3" white cloth stapled to a dowel and weighted with a second dowel, is dragged over dry grass and brush and inspected at fixed intervals for ticks. Flagging involves brushing higher vegetation with a cloth attached to one end of a pole. Such areas include the understory in wooded areas and brush and shrubs in open areas, along edge habitats, and along property borders.

Prevention

Limiting exposure to ticks is presently the most effective method of prevention. Other prevention methods include the following.

- Wear light-colored clothing. This will allow ticks to be detected more easily.
- Wear long sleeves and long pants that are tight around the wrist, ankle, and neck. Tuck pants into socks to prevent ticks from crawling up the inside of pants' legs.
- Walk in the center of paths and avoid vegetation along path edges.
- Treat exposed areas of skin with repellents to discourage tick attachment. Repellents containing DEET (n, n-diethyl- m-toluamide) can be applied to the skin, but will last only a few hours before reapplication is necessary. Use DEET (supplied by parents and only with parental permission) with caution on children because adverse reactions have been reported. Refer to Mosquito fact sheet for more information on the use of repellents. Repellents should not be applied under clothing and should be washed off when indoors.

- Adults and students should check themselves immediately after visiting a potentially tick-infested area. Pay close attention to hair, armpits, shoulders, waist, and inner thighs. Remove any tick found on the body.

Removal of Ticks

- Use fine-tipped tweezers to remove attached ticks. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. If this happens, remove mouthparts with tweezers or consult the school nurse.
- Do not squeeze, crush, or puncture the body of the tick because its fluids may contain infectious organisms.
- Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin.
- Apply rubbing alcohol to the bite and wash hands with soap and water.

The tick may be saved for future identification should disease symptoms develop within 2-3 weeks. Place the tick in a small vial containing rubbing alcohol. Write the date of the bite on a piece of paper with a pencil and place it in the vial.

Note: *Folklore remedies such as petroleum jelly or hot matches do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva, increasing the chances of transmitting a tick-borne disease. These methods of tick removal should be avoided. Also, a number of tick removal devices have been marketed, but none are better than a plain set of fine tipped tweezers.*

Chemical Control

Restrict application of pesticides to high-risk tick habitat such as edges of lawn and woodlands. Spraying open fields and lawns is not necessary. The product must be labeled for area-wide tick control. Pesticides may only be applied on school grounds by a licensed commercial applicator.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Notifications in Schools".

Tick References

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IPM for Spiders and Ticks in Schools. 2004. **IPM for Pennsylvania Schools: A How-To Manual.** Pennsylvania Department of Agriculture and Pennsylvania State University. <http://resources.cas.psu.edu/ipm/schoolmn/spiders.pdf>.

Maine Medical Center Research Institute Vector-Borne Disease Laboratory: <http://www.mmcri.org/lyme/lymehome.html>.

Prevention of Tick-borne Diseases. 2007. Maine Center for Disease Contol and Prevention. <http://www.maine.gov/dhhs/boh/ddc/tickborne_prevention.htm>.

Stafford, K. 2004. **Tick Management Handbook**. The Connecticut Agricultral Experiment Station. p. 39-54. <http://www.cdc.gov/ncidod/dvbid/lymeresources/hnadbook.pdf>.

School IPM Fact Sheet

Ten Practices That Prevent or Minimize Ornamental Plant Problems

Many plant problems can be prevented through good landscape management practices. Other problems can be minor or serious, depending on how early you detect and manage them. Some practices cause long-term problems that weaken plants, which then fall victim to problems that should be minor. Here are ten practices, with specific examples, that can help you prevent some problems, minimize others, and improve the overall quality of your landscape.

1. Design landscapes to support good horticultural practices and minimize damage to plants.
   - Consider long-term maintenance when making every decision, from concept to design to installa tion to maintenance.
   - Design adequate walkways; compacted lawns at sidewalk edges are invaded by weeds like purslane and knotweed.
   - Mulch widely around trees and shrubs, to reduce competition from lawns and prevent string trimmer/mower damage.
   - Design shrub borders, flower beds, fences and other features in a way that makes mowing around them easy and safe.

2. Inspect all materials before you bring them into the landscape.
   - Mulches, compost and soil can contain weeds, weed seeds, disease propagules, road salt and chemical residues.
   - Plant root balls can contain weeds, weed seeds, disease propagules and insects such as European red ant.

3. Choose plants that have the ability to thrive in the site's conditions.
   - Choose plants suited to the site's wind, temperature, soil characteristics, and water availability.
   - Choose plants that will support users' activities: foot traffic, school activities, vehicle exhaust, and urban pollution.
   - Consider the long-term cost of pruning, mulching, weeding, irrigating, fertilizing, mowing, edging, and raking leaves.
   - Avoid plants prone to local problems. Many viburnums are vulnerable to viburnum leaf beetles. True lilies are eaten by lily leaf beetles. Roses are popular with Japanese beetles and many plants are favored by deer.

4. Choose plants that have the potential to do what you expect them to do.
   - Trees can provide shade, form a windbreak, produce seasonal color, and control erosion … but no one tree does it all.
   - Of turfgrasses, bluegrass is the best for sports, fescue does well in shade, ryegrass grows fast… but no one does it all.
   - When selecting any plant, think about its function first, and other features (beauty, price, etc.) second.

5. Choose plants whose growth potential fit your spaces.
   - Spacing plants too closely encourages disease development and discourages plant vigor.
   - Trees that are too large for a space can conflict with power lines and may lead to power company pruning.
   - Trees in tight spaces may not develop good root systems and can become a danger to buildings and people.
   - Trees in tree pits do not develop normal root systems and often die from what should be minor problems.
   - Trees planted too close to buildings can cause foundation problems.
   - Plants planted under the building overhangs receive low water and light and are prone to winter ice damage.
   - Plants in and adjacent to parking lots are prone to snowplow damage, salt damage, and auto impact.
   - Plants planted next to playgrounds may be damaged by bicycle chains or may be otherwise vandalized.
   - Siting shrubs according to their mature size nearly eliminates the need for pruning.
   - Siting plantings away from play areas and other high-pedestrian traffic areas reduces problems of soil compaction.

6. Purchase only the highest quality plants, plant them correctly, and get them off to a good start.
   - Establish a trust-based relationship with a knowledgeable local nursery/garden center/landscape professional.
   - Buy early in the season for the best choice of plant materials; buy healthy plants with excellent shoots and roots.
   - Dig wide planting holes as deep as the plants' root systems, so that you set plants on firm native ground.
   - Tease soil away from the base of trees and shrubs, locate the crown, and site it at ground level when planting.
   - Remove containers from plants, even if the containers are fiber pots or burlap.
   - Amend soil minimally, only if needed, and never more than 25% by volume (3 parts soil : 1 part organic matter).
   - Handle trees and shrubs by their root balls, not by their stems.
   - Position a tree or shrub in its planting hole, backfill half-way, tamp with shovel, water to settle; repeat to fill hole.
   - Mulch the root zone of plantings with 2-3" of bark mulch, pulling it back 6" from stems; never volcano-mulch!
   - Newly planted plants must develop roots before they can take up fertilizer; start fertilizing the year after planting.
   - Water thoroughly after planting. Repeat the next day. Irrigate to prevent water stress during the establishment time.
   - The establishment time for a mature tree may be three or more years.
   - To water thoroughly, irrigate the equivalent of 1" to 1.5" water over the area of the plant's root zone per week.
   - The root zone of an established tree can reach 2-3 times the width of the canopy.
   - Water early in the day so that excess water evaporates; watering in the evening promotes disease development.

- Use water-conservative irrigation systems like drip irrigation, which delivers water directly to the roots.
- Avoid overhead sprinklers; they waste water, and improve conditions for disease development by wetting leaves.
- Do not overfertilize. Plants vary in nutrient needs; always fertilize according to a soil test recommendation.

7. Learn the pest/problem complex of the plants you choose, and monitor appropriately for them.
   - Many problems can be avoided through good plant choice; examples include crabapples resistant to multiple diseases and phlox cultivars that are resistant to powdery mildew.
   - Check for problems that you anticipate at the times of year when you'd expect to see them.
   - If using chemicals to manage problems, use appropriate chemicals at times when they are most likely to be effective.

8. Spot-treat problems as they develop with IPM, cost, and labor in mind.
   - Many problems can be controlled by pruning, or spot-treating very localized outbreaks.
   - Problems left unchecked can develop into serious threats to plant survival.
   - Spot-treating takes less time, less product, and less money than larger scale problems.
   - Some pests can easily be managed nonchemically: prune out viburnum twigs containing eggs in late fall, handpick tent caterpillar egg masses in winter, prune or hand-remove fall webworm nests in late summer, etc.
   - Follow specific protocol on pesticide labels. Use personal protective gear. Follow state and federal application laws.

9. Educate the users of the landscape about how to interact with the space appropriately and respectfully.
   - Communicate in a variety of ways: conversations, memos, emails, announcements, and signs all have their place.
   - Good landscape design helps people use spaces appropriately: curbs stop vehicles, fences create boundaries, etc.
   - Help frequent users of the landscape develop a sense of ownership; they'll help you educate others to respect it.
   - When people misuse the landscape, evaluate the situation and consider how a better design might mitigate the problem.
   - Establish a protocol for "gift" and "memorial" plants, considering site conditions, function, design, and maintenance.

10. Learn from others … attend classes and workshops … consult experts … read … and educate others.
    - You can learn what problems are active in an area by communicating with other local landscape managers.
    - New problems develop over time; knowledge can help you stay one step ahead of some of those problems.
    - Check these websites (just a sample; develop a longer list specific to your landscape needs):
      - Pest management information for New England: <http://pronewengland.org/>.
      - Cornell's turf management guidelines: <http://ipmguidelines.org/turfgrass/>.
      - Weed photos: <http://www.umassgreeninfo.org/fact_sheets/weed_herbarium/common_name_list.htm>.

- List of Maine native plants for landscape use: <http://www.umext.maine.edu/onlinepubs/htmpubs/2500.htm>.
- Yardscaping: <http://www.yardscaping.org/http://www.yardscaping.org/>.
- Plant database with keys, selectors, etc.: <http://www.hort.uconn.edu/Plants/index.html>.
- Maine Board of Pesticides Control: <http://www.maine.gov/agriculture/pesticides/about/index.htm>.
- University of Maine Cooperative Extension: <http://www.umext.maine.edu>.

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School IPM Fact Sheet

Eastern Tent Caterpillar

Webs of the eastern tent caterpillar are a common sight in spring, especially where wild cherry, their favorite food, is abundant. During the day caterpillars feed on leaves; the webs protect them at night. After they strip one tree of leaves they crawl to others to continue feeding. During outbreaks tent caterpillars may attack cherry, apple, hawthorne, peach, plum, witch hazel, rose, beech, birch, willow and poplar. Defoliated trees are weakened but the damage often occurs early enough so that trees can replace their leaves.

Life cycle

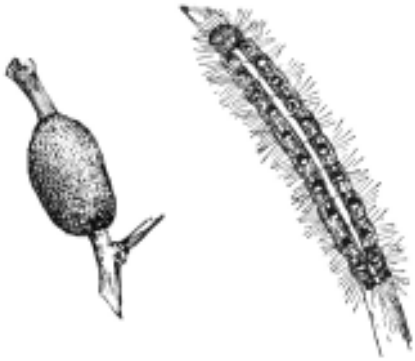
Tent caterpillars spend the winter as dark, collar shaped egg masses about 1 inch long on branches and twigs. Each egg mass contains 150-300 eggs. Eggs hatch in spring, when tree buds begin to open. Young caterpillars construct tent-like silken masses near the trunk in branch crotches. They feed for 6-8 weeks before tranforming into adults. Adults emerge in July and live less than a week—just long enough to mate. There is a single generation each year.

Monitoring

- After autumn leaf fall, look for egg masses on susceptible trees; record locations and quantities.
- In May, when buds begin to develop, look for webs in susceptible trees.

Management

- Remove wild cherry trees from hedgerows and fields near susceptible ornamentals.
- Remove egg masses or prune twigs containing egg masses and destroy them by crushing and then coating them with a 50-50 mix of laundry detergent and water.
- Remove webs when they appear in early spring. Crush them on pavement or drop them into a 50-50 detergent/water mix. Do this in the evening when larvae have returned to the web; wear gloves to avoid skin irritation.
- Biological control using of *Bactillus thuringiensis* (Bt) can be very effective in eastern tent caterpillar control. Make applications to foliage when the larvae are small (less than $^1/_2$ inch).
- Chemical control is usually unnecessary if all of the above methods are used. If populations still exist, judicious chemical controls may be used. Chemical controls are most effective against young larvae; web size should be no more than three inches in diameter. Applications should be made in late morning when larvae congregate near the nest surface to warm in the sun.



Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See Standards for Pesticide Applications and Public Notifications in Schools.

School IPM Fact Sheet

Viburnum Leaf Beetle

Adults and larval viburnum leaf beetles feed exclusively on plants belonging to the genus *Viburnum*, sometimes killing the plant. This species is native to Europe but is now established in Maine.

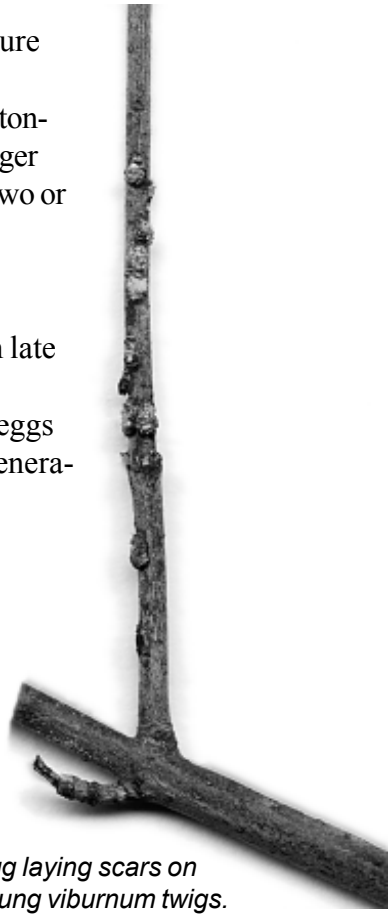
Adults are about 3/8 of an inch long and yellowish to light brown. Mature larvae are larger than the adults (about 1/4 inch), shiny, greenish-yellow to white, and covered with dark dots. The first sign of infestation is young, skeletonized leaves. Both larvae and adults feed on foliage between the midrib and larger veins, usually on the lower leaf surface. Plants that have been defoliated for two or three consecutive years may die.

Life Cycle

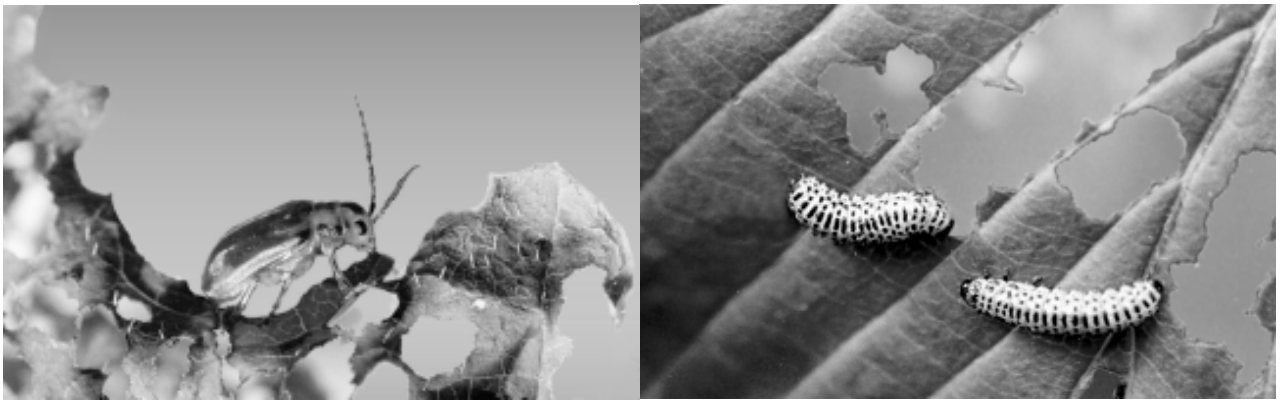
Viburnam leaf beetles overwinter as eggs on host twigs. Eggs hatch in late May or June. Larvae feed on viburnum leaves and eventually drop to the ground to pupate. Adults usually emerge in July. Females deposit several eggs on the tips of the branches from late summer into fall. There is only one generation per year.

Management

- Prune and destroy infested twigs after egg laying has ceased in the fall—anytime from October to May. Look for egg sites that seem to swell and peel as the temperatures warm.
- Monitor the lower leaf surface for the presence of larvae in late spring. Hand-pick larvae and destroy.
- Plant less susceptible species of viburnums.



Egg laying scars on young viburnum twigs.



Adult viburnum leaf beetles (left) and larvae (right) feed exclusively on viburnum leaves.

School IPM Fact Sheet

White Pine Weevil

The white pine weevil is the most serious insect pest of white pine in Maine. The weevil also attacks Norway spruce, Colorado blue spruce, jack pine, red pine, Scotch pine, mugho pine, and native spruces. Feeding damage kills the tops of conifers leaving unsightly dead leaders (the top-most branch of the tree) and distorted growth.

Adults are active in early spring laying eggs in the bark of the highest stems on the tree. After hatching, the weevil grubs tunnel under the bark and girdle the branch. Dripping resin is commonly observed from damaged stems. Typically, the top $1^1/_2$-2 feet of the main stem is killed. Adult weevils emerge in July, feed on new growth in the crown of infested trees, and eventually burrow into the ground litter, often at the base of host trees, to over-winter.

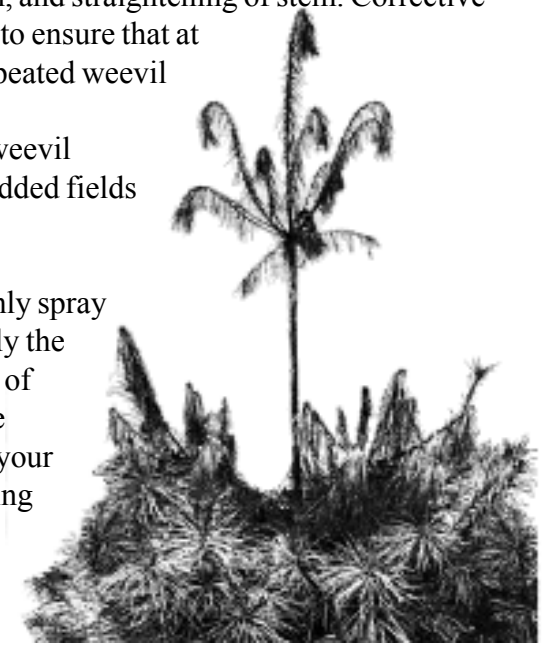
Management

At low infestation levels, prompt removal of infested leaders can limit population increases. Prune wilting leaders by mid-July before the adults emerge. Cut the stem below the grubs by including at least some green bark at the base of injury. Immediately burn the cuttings to destroy the larvae and pupae. Pruning infested leaders early in the season encourages the growth of a new leading stem and keeps the natural form of the tree.

Corrective pruning of injured tops should remove all but a single shoot at the topmost healthy whorl. This promotes healing, resumption of vertical growth, and straightening of stem. Corrective pruning may be postponed until the year after weevil injury to ensure that at least one lateral branch survives ice and snow damage or repeated weevil attacks the following year.

Avoid planting white pine or spruce in areas with high weevil populations. Locations with heavy clay soils and densely sodded fields may increase the chance of weevil attack.

Chemical Control. If pesticides are necessary, thoroughly spray the top half of all leading stems before the buds open (usually the first week in May). An extended spray rod that reaches tops of taller trees may be required for complete coverage. In severe cases, fall treatments can reduce adult populations. Contact your Cooperative Extension office for more information concerning chemical control for white pine weevil.



Leaders damaged by white pine weevil bend into a characteristic "shepherd's crook." WIthout corrective pruning the tree trunk may become forked or crooked.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Notifications in Schools".

School IPM Fact Sheet

White Grubs

Some of the most prevalent turfgrass pests are white grubs. These are the C-shaped larvae of a large group of beetles known as scarabs. Many scarabs attack turfgrasses and cause considerable damage. The three important species in Maine are the Japanese beetle, May or June beetle, and the European chafer.

White grubs in turf share similar life cycles. They develop in the soil and feed on grass roots. In the summer, adults emerge from the soil and feed on foliage and/or flowers before mating and depositing their eggs in turf. The eggs hatch in August and larvae feed on grass roots until October. As soil temperatures cool, the grubs move deeper into the soil to overwinter. The following April or May, they return to the surface and begin feeding again before emerging as adults.

Damage

White grubs eat organic matter including the roots of plants. Heavily infested turf is water stressed—off color, gray-green, and wilts rapidly in the hot sun. Fine and tall fescues are not as severely attacked as Kentucky bluegrass and perennial ryegrass. Continued feeding kills turf in large irregular patches.

Dense grub populations can reduce the playability of athletic fields. The tunneling of the larvae gives turf a spongy feel; large patches can often be rolled back like loose carpet. Animals, such as crows, skunks, or raccoons, are attracted to these areas to feed on grubs, causing considerable damage as they dig. While these animals help keep grubs under control, too much of this damage may be unacceptable on athletic fields.

Japanese beetle

The Japanese beetle was introduced into southern Maine during the early 1960s. Adults are dark metallic green beetles about 1/2-inch long. Adults are voracious plant feeders and may become serious pests of ornamental landscape plants and trees including maple, birch, mountain ash, linden, grape, blueberry, rose, apple, cherry, peach, and plum. Japanese beetle adults emerge from late June to mid-July, often in large numbers. They aggregate in dense populations inflicting heavy damage to ornamental leaves and flowers.

May or June beetle

May/June beetles are native and found throughout Maine. They are shiny, robust, reddish-brown beetles nearly 1-inch long. Adults emerge in May or June and are active at night. They are highly

White grub

Japanese beetle

May/June beetle

European chafer

attracted to lights, frequently fly into windows and screen doors, especially during hours of peak activity—7:00 to 9:00pm. Egg laying may be concentrated near exterior lighting. May/June beetles have a three-year life cycle. The grubs are most damaging in their second year when they feed heavily from May through September.

European chafer

The European chafer has recently been introduced to the southern and coastal areas of Maine. It is expanding its range inland. The adult is light-brown and $^{5}/_{8}$-inch long. European chafers tend to remain in the root zone later in the fall and return to the root zone earlier in spring than other white grubs.

Adults emerge from the soil in June and July. At dusk they congregate in conspicuous mating flights, usually at a tall object on the skyline, such as a tree 20-30 feet high. Swarms may number in the thousands and may look and sound like a swarm of bees. Larval damage is later concentrated in the turf around these swarms.

Monitoring

Monitoring for white grubs involves sampling several locations across an area of turf. It is important to use a uniform method to accurately assess the population. Walk in a zigzag pattern across the field, taking samples at 10-20 foot intervals from at least 10 locations. Begin sampling in August when grubs are easily seen and actively feeding, but before signs of injury are visible.

Take square foot samples using a small shovel to cut through the turf and thatch on three sides of a square. Peel back the turf and inspect the thatch and upper 2-3 inches of soil. To find the grubs, shake the sample, and probe through the soil and roots with a pocket knife or screwdriver. Count the number and species of grubs found at each sampling site and record these on a map of the area. Replace the sod after sampling and irrigate thoroughly. A quicker method is to use a golf course cup cutter. This cuts a round core of about $^{1}/_{10}$ square foot. Multiply the average grubs per core by 10 to get the approximate number of grubs per square foot.

White grubs are distributed in patches. Be sure to sample in the most likely turfgrass habitats. Japanese beetles and European chafers prefer grass in sunny areas, and high quality turf near the adult's favorite food plants. May/June beetles often lay large numbers of eggs under or near exterior lights. If white grubs are not detected but damage is present, examine the turf for other causes of injury such as disease, excessive thatch, moisture stress, heat damage, or other insect pests.

Action thresholds

Japanese beetle and European chafer. Irrigated turf has a tremendous ability to recover from injury. Even so, irrigated turf with more than 20 grubs per square foot will likely suffer from water stress. In un-watered turf, 5-10 grubs per square foot may result in brown patches.

May/June beetle. Large grubs can cause more damage. Turf injury is likely if more than 10 grubs per square foot are found on irrigated turf, or if more than 3-5 per square foot are found on low maintenance turf.

Prevention

Do not plant roses, grapes, or lindens around high maintenance turf areas.

Water management

White grubs usually need moist soil for eggs to hatch. The young larvae are also very susceptible to dry conditions. In areas where turf can stand some moisture stress, do not water in July and early-August when white grub eggs and young larvae are present. Use water management cautiously; dry soil will accentuate any existing white grub damage.

Traps

Adult Japanese beetles are highly attracted to traps baited with floral and pheromone lures. The traps are useful for monitoring the presence of adult populations, but they are not useful for controlling turf damage. Traps may have some utility for managing Japanese beetles on ornamentals, although plants near traps can sustain increased damage. These traps are recommended only as a means of drawing beetles far away from very susceptible landscape plants. Place them as far away as possible from valued ornamentals and high-maintenance turf.

Biological control

Certain nematodes (microscopic wormlike animals that can cause disease in insects) have shown some promise for controlling white grubs in turf. *Steinernema glaseri* works consistently but may be difficult to find; *Heterorhabditis bacteriophora* and *H. heliothidis* provide moderate white grub control. Other species, including *S. riobravis*, *H. megidis*, and *H. zealandica* have provided good white grub control in research trials.

Nematodes are very sensitive to drying and must be used carefully. They should be watered in as soon as they are applied to turf, either by applying them during rain, or by irrigating immediately after application. Do not apply nematodes during the hottest parts of the day. When preparing them for use, keep them cool and out of the sun; store them in a cooler if the day is hot. An excellent resource on the use of nematodes for grub management is: www.oardc.ohio-state.edu/nematodes.

The naturally occurring soil fungus *Beauveria bassiana* is commercially available and may be effective against white grubs. *B. bassiana* requires high humidity to infect insects. Research has shown promising results, but only when the fungus is used during a wet summer.

Chemical control

White grubs are most susceptible to chemical control when they are very small. The degree of control is highly variable from site to site and year to year, but insecticides may provide 50-80% control of white grubs. If irrigation is available, liquid insecticide applications can be effective if applied with proper timing (usually late summer). Granular insecticides are often more effective where irrigation is not possible.

Apply spot treatments in late August and early September. Early morning or evening is the preferred time for insecticide treatments. If soil moisture is unusually low at the time of application, consider irrigating the area a day or two before the intended application to draw the grubs up into the upper root zone. Irrigate after application to wash the treatment into the soil. Three weeks after treatment, evaluate the treatment by sampling for grubs where the original samples were taken. Be sure to record the results for future reference. Keep in mind that no insecticide will eliminate an entire grub population, but the numbers can be reduced below the action threshold.

Research indicates that most of the pesticide applied for grub control ends up in the thatch. Irrigating before or after an application does affect this binding. If the thatch layer is an inch thick or more, grubs probably will not contact an effective dose of any applied insecticide.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Public Notifications".

School IPM Factsheet

Weed Management

Weeds in parking lots, walkways, under fences and similar areas

Weeds are often defined as plants growing in places where they're not wanted. In some cases, the designation of a "weed" can be quite subjective such as dandelions in a lawn which affects the aesthetics. In other cases, weeds are unwanted because they are harmful to people such as poison ivy or thorny plants. Finally, weeds can be unwanted because they grow in areas intended to be free of vegetation such as parking lots, walkways, fence lines, or infields.

Cultural practices for weed management

- Proper design and construction reduces the need for weed management. For example, placement of concrete or asphalt mow strips under fencing or backstops provides long term weed management. Most landscape areas can be designed for either long term weed exclusion or mechanical weed management with mowers or string trimmers.
- Install posts 8-12 inches inside the edge of the pavement, when fences surround paved playing surfaces such as basketball or tennis courts.
- Use landscaping fabric in plant beds and under stone or brick walkways.
- Retrofit existing cyclone fence lines by pouring a 16-inch concrete or asphalt strip to cover the soil under and beside the fence. Retrofits can be done in stages over several years as budgets permit.
- Mulches inhibit weed growth by blocking sunlight. Apply mulches immediately after the ground is disturbed or plants are installed. Mulches should to be 3-4 inches thick. Reapply mulch periodically.
- Suppress weeds on baseball infields, running tracks, and other bare soil areas using periodic shallow cultivation with a tractor mounted rotary harrow, also called a rotary hoe or power rake.
- Use hand weeding, string trimmers, and mowers wherever possible.
- Plant groundcovers with rapid, spreading growth habits between shrubs.
- Plant fast growing annual flowers such as sweet alyssum, farewell to spring, and scarlet flax in bare areas between bedding plants or shrubs.
- Seal cracks on asphalt surfaces. If weeds are present, control them with flamers before sealing.

Chemical weed management

- Chemical control of weeds should only be considered when cultural controls have been exhausted or are unrealistic.
- In Maine, herbicides can only be applied at schools by a licensed pesticide applicator and should be applied when school is not in session (weekend or summer). Be sure the treated areas are posted to prevent accidental exposure.
- Selective herbicides (broadleaf or grass killers) and non-selective herbicides are available.
- Discuss herbicide choices with your licensed applicator. Select least toxic, effective materials.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Public Notifications in Schools".

School IPM Fact Sheet

Turf Establishment

The foundation of Integrated Pest Management requires steps to ensure turf gets a good start when lawns and fields are first established. Turf can be established from seed or sod. Soil preparation is the same for either method and is the foundation for growing quality turf. Below are guidelines for establishing turf. For more information about turf management see **Outdoor Pest Management for Maine Schools** at http://www.maine.gov:8080/agriculture/pesticides/schoolipm/pdf/outdooripm.pdf.

Turf establishment requires a specific sequence of actions

- Soil test.
- Lime to adjust pH based on soil test.
- Apply starter fertilizer at the rate of 1.0 lb. Phosphorous/1000 sq. feet.
- Roto-till amendments into the top 4" of the soil mix.
- Finish grade.
- Firm soil and finish rake.
- Apply a complete fertilizer at the rate of 1.0 lb. Nitrogen/1000 sq. feet.
- Seed or sod.

Sod establishment

- Select top quality sod from a reputable sod grower.
- When root mix is sandy material, request sod grown on sandy soil; if not available, purchase washed sod.
- Sod should be laid quickly, rolled, and then irrigated with sufficient water so as to wet the soil beneath.
- Maintain moist soil beneath the sod by irrigating on a daily basis or as needed for the first three weeks.
- Restrict use until sod is well established (minimum of 4-6 weeks).

Seed establishment

- Select a mix of top quality seed varieties from a reputable seed dealer.
- Seed at half rate in one direction and at half rate in a perpendicular direction.
- Seed ideally in late August - early September or when unavoidable, seed in May - June.
- Lightly rake seed into the top $^1/_8$-$^1/_4$ inches of the soil.
- Roll to firm seed in contact with soil.
- Mulch with straw, compost, or other weed and seed free organic material or row cover fabric for spot areas.
- Irrigate lightly and frequently (maintain moist seedbed) until seed germinates.
- As turf develops, increase amount of irrigation and interval between irrigation.
- Irrigation will be critical to proper establishment over the first two months.
- Restrict use until turf is well established, usually 2-4 months.
- Athletic fields require a full year to mature before use.

School IPM Fact Sheet

Turfgrass Species Selection

Turf Integrated Pest Management begins with growing the grass species most likely to succeed. Choose the best adapted species for the site conditions and the intended use of the area. The wrong species in the wrong place will led to increased need for water, fertilizer, and pesticides. Use these guidelines for choosing turf grass species when establishing, renovating, or overseeding athletic fields and lawns.

- Grass species well adapted for use in Maine as athletic fields or general lawns include Kentucky Bluegrass, Creeping Red Fescue, Chewings Fescue, Hard Fescue, Perennial Ryegrass, and Tall Fescue. Mixtures including Kentucky Bluegrass, Fescue, and Perennial Ryegrass are best.
  - Level A athletic fields: 80% Kentucky Bluegrass (2-3 varieties) and 20% Perennial Ryegrass (2 varieties) or 60%-80% Tall Fescue and 20%-40% Kentucky Bluegrass
  - Level B athletic fields: 60% Kentucky Bluegrass (2-3 varieties), 20% Creeping Red Fescue, and 20% Perennial Ryegrass, or 80 % Tall Fescue, 10% Perennial Ryegrass, and 10% Kentucky Bluegrass
  - General Lawns: 40% Kentucky Bluegrass (2 varieties), 20% Chewings Fescue, 20% Hard Fescue, 20% Perennial Ryegrass
  - Low impact lawns: 40%-60% Creeping Red Fescue or Tall Fescue, 10%-20% Chewings Fescue, 10%-20% Hard Fescue, 10%-20% Kentucky Bluegrass, 0%-5% Dutch white clover
- Certain varieties of fescue and perennial ryegrass have Endophytes, a beneficial fungi, that controls surface feeding insects. Choose to use these if available.
- Improved varieties of each species exist and should be considered for use. New varieties are continually being developed and information is available at The National Turfgrass Evaluation Program (www.ntep.org/). National testing has shown the following have good general characteristics.
  - Kentucky Bluegrass: Liberator, Champagne, Bordeaux, Cabernet, Award, Midnight, Nuglade, North Star, Baronie, Odyssey
  - Perennial Ryegrass: Affirmed, Citation III, Linn, Stardance, Pennfine, Advantage, Palmer III, Secretariat, Brightstar II, Calypso, Premier II, Pennant II, Exacta, Churchill, Charismatic
  - Chewings Fescue: Shadow II, Banner III, Brittany, Tiffany, Bridgeport
  - Hard Fescue: Discovery, Reliant II, SR 3100, Osprey, Defiant, Nordic
  - Creeping Red Fescue: Florentine, Shademaster II, Jasper
  - Tall Fescue: Masterpiece, Rembrandt, Picasso, Davinci, Endeavor

School IPM Fact Sheet

Soil Tests

A routine soil test is a quick and inexpensive way to check the level of nutrients that are available for plant growth. Soil tests save money and prevent water pollution by indicating:

- The soil pH.
- Levels of potassium (K), phosphorus (P), calcium (Ca), magnesium (Mg).
- Level of organic matter.
- The presence of lead contamination.
- How much lime and fertilizer (organic or chemical) to add.
- Management tips for growing healthy plants.

Test your soil at least once every three years. Test more often in problem areas, or where abundant nutrients have been added. Record test results to track changes. Note that there are no reliable tests for measuring nitrogen levels in soil. Test results come with recommendations for the next growing season, so sample the soil in early spring, after the frost is out of the soil, or in the fall, before the ground freezes (wait several weeks after your last fertilizer application before sampling). Fall sampling will give the same test results as spring sampling. A soil test usually takes two to three weeks to complete. Several companies offer soil testing. The following procedure is recommended by UMaine's Soil Testing Service (*<http://anlab.umesci.maine.edu/>)*.

Taking a good soil sample

1. Get a Maine Soil Testing Service kit from your County Extension Office or from the Maine Soil Testing Lab, 207-581-3591 (or http://anlab.umesci.maine.edu). Some garden centers may carry them as well.

2. Using a clean tool, take several samples from different spots to fully represent the sample site. Sample in the root zone (usually at 6-8 inches depth for gardens and 3-4 inches depth for turf).

3. Combine all samples in a clean container, mix thoroughly, and fill the sample box.

4. Label the container with your name, address, and sample identification.

5. Fill out the information form, available online at <http://anlab.umesci.maine.edu/forms/forms.htm>. Keep a copy for your records.

6. Deliver to your County Extension office or mail to the Soil Testing Lab. A standard soil test costs $10.

School IPM Fact Sheet

Turf Fertilizer

Fertilizer analysis

The fertilizer analysis is listed on the label as a series of three numbers. For example, consider a 50 lb. bag of fertilizer with an analysis of 10-6-4. The first number lists the percentage of nitrogen. In this example 10% of the bag is Nitrogen (abbreviated as N). The second number is the percentage of Phosphorus (P_2O_5). In this example 6% of the bag is Phosphate. The third number is the percentage of Potassium (K_2O). In this example, 4% of the bag is Potash. Thus, our 50 lb. bag of 10-6-4 fertilizer actually contains:

10% x 50 lb. = 5.0 lb. of Nitrogen
6% x 50 lb. = 3.0 lb. of Phosphate
4% x 50 lb. = 2.0 lb. of Potash

Determining application amounts

Rates of application are usually stated as pounds of nitrogen (abbreviated as N) per 1000 square feet. A thousand square feet is a common measure of area used by turf managers (abbreviated as M). Thus, an application rate of 0.5 lb. nitrogen per 1000 square feet is written as 0.5 lb. N/M.

To determine pounds of fertilizer to use for a particular application rate:

$$\frac{\textbf{Application rate}}{\textbf{\% N}} = \textbf{Pounds of fertilizer product to use}$$

For example:

Using fertilizer with a 10-6-4 analysis (10% N), the amount needed to apply 0.5 lb. N/M is

$$\frac{0.5 \text{ lb.}}{10\%} = \frac{0.5}{0.10} = 5.0 \text{ lb. of fertilizer product}$$

Using the same product, the amount needed to apply 1.5 lb. of nitrogen/M is

$$\frac{1.5 \text{ lb.}}{10\%} = \frac{1.5}{0.10} = 15.0 \text{ lb. of fertilizer product}$$

School IPM Fact Sheet

Turf Irrigation

The amount of water needed for healthy and productive turf varies according to the amount and type of field use. High-use athletic fields need 1 inch of water per week during the growing season from either rainfall or irrigation. Less water is needed in spring and fall and sometimes slightly more is needed in summer, depending on turf condition and use. For more information about turf management see **Outdoor Pest Management for Maine Schools** at http://www.maine.gov:8080/agriculture/pesticides/schoolipm/pdf/outdooripm.pdf. Below are some irrigation guidelines.

- All athletic fields used for fall sports benefit from late summer irrigation during a drought period. This irrigation reduces the need for pesticides and fertilizers.
- Many factors influence the exact amount needed per week.
  - Kentucky Bluegrass needs more water than Fescues.
  - Clay soils hold more moisture and hold it longer than sandy soils.
  - Turf with southern exposure uses more water than that with a northern exposure.
  - Areas with full sun use more water than areas with partial shade conditions.
  - Low humidity, high temperatures, and sunshine lead to greater water use.

Turf irrigation techniques

- Calibrate irrigation system output.
- Match irrigation rate to the infiltration rate of the soil.
- Irrigate infrequently and deeply (2 - 3 times per week).
- For best efficiency and to reduce disease potential, irrigate in the early morning hours.

Pitfalls of excess irrigation

- Wet turf is weaker and more easily damaged by traffic or play.
- Wet soil compacts and reduces potential for optimum growth.
- Water and air must be balanced in the soil; excess water suffocates roots.
- Excess water leaches nutrients out of the root zone and contaminates groundwater.
- Wet turf is more susceptible to fungal diseases.

School IPM Factsheet

Athletic Field Turf Management

Athletic fields require maintenance and performance according to the amount and type of use they get. Schools generally have **High Maintenance** game fields and **Low Maintenance** practice and recreation fields. Both types require proper design and construction including surface and sub-surface drainage, good root mix, adapted turfgrass species, and proper establishment techniques. For more information about turf management see **Outdoor Pest Management for Maine Schools** at http://www.maine.gov:8080/agriculture/pesticides/schoolipm/pdf/outdooripm.pdf.

High Maintenance Fields

- Irrigate to supplement rainfall. Provide 1.0 inch of moisture per week with early morning applications.
- Mow at 2.0-3.0 inches, frequently enough to remove 1/3 of the leaf blade or less. This also eliminates clipping build up.
- Mow with sharp mowers, when turf is dry and soil is not excessively moist.
- Soil test and adjust pH as needed.
- Fertilize with 50%-100% WIN material. Use rate of 0.5-0.75 lb. N/1000 sq. feet around May 15, June 15, Sept. 1, and Oct. 15.
- Phosphorus and potassium fertilization amounts should be based on a soil test.
- Aerify once or twice per year either in the spring or fall.
- Overseed thin areas of field in May - June or September.
- Limit games or practices when field is wet; particularly when soil is moist. Traffic on wet turf or excessively wet soil is particularly damaging.
- Scout for weed, insect, or disease problems.

Low Maintenance Fields

- Irrigate in late summer if turf is dormant and field will be used for fall sports.
- Mow at 2.5-3.0 inches, frequently enough to remove 1/3 of the leaf blade or less. This also eliminates clipping build up.
- Mow with sharp mowers, when turf is dry and soil is not excessively moist.
- Soil Test and adjust pH as needed.
- Fertilize with 50%-100% WIN material. Use rate of 0.5-1.0 lb. N/1000 sq. feet around May 15, and Sept. 1.
- Phosphorus and potassium fertilization amounts should be based on a soil test.
- Aerify once per year either in the spring or fall.
- Overseed thin areas of field in May - June or September.
- Limit games or practices when field is wet; particularly when soil is moist. Traffic on wet turf or exces sively wet soil is particularly damaging.
- Scout for weed, insect or disease problems.

Anyone making pesticide applications on school property must be licensed by the Board of Pesticides Control. See "Standards for Pesticide Applications and Public Notifications in Schools".

Record Keeping and Monitoring Forms

The following forms should be used to record your school's IPM data. These forms can be used as they are or modified to fit individual circumstances. Fill in pertinent information and keep these forms in your schools' IPM logbooks.

IPM Contact Information
Names and contact information for people involved in local school IPM. 131

Pest Sighting Log
Pest reports from students and staff. The IPM coordinator responds to these entries in a timely fashion. Contracted pest control companies may also insert their own sighting log. 132

Pest Management Response
Record of the action taken in response to pest sightings. Keep these in the IPM logbook. 133

Pesticide Application Log
Every pesticide application made on school property should be recorded. Commercial applicators are required by law to keep records. If you work with contracted pest managers, include a copy of their application report in your IPM logbook. 134

IPM Inspection Checklist
School personnel trained in IPM use this form to inspect specific areas. If problems are found, a Detailed Inspection Form is used track management activities. 135

Detailed Inspection Log
Use this form to clarify problems noted on IPM checklists and monitoring forms and to track locations with recurrent problems. 137

IPM Monitoring Form
This form can be used to monitor any area of school property—building interiors or exteriors, landscaping, turf, etc. If problems are noted, a Detailed Inspection Log is used track management activities. 138

Trap and Bait Monitoring Form
Record the maintenance and collection data for all pest monitoring devices. Contracted pest control companies should provide their own map. Items on this form are located with the following Monitoring Maps. 139

IPM Contact Information

School District:_____

Address:_____

_____

Telephone:_____ **Fax:**_____

School IPM Staff	Name/Position	Telephone/Fax	Schedule
IPM Coordinator			
Secondary IPM Contact			
Admin. Contact			
Other:			

Pest Control Operator (PCO):_____

Address:_____

_____

Telephone:_____ **Fax:**_____

PCO Staff	Name	Telephone/Fax	Schedule
Primary Technician			
Secondary Technician			
Supervisor			

Pest Sighting Log

Facility: _____ **IPM Coordinator:** _____

Type of Pest or Description	Number of Pests Seen	Location Sighted	Time and Date of Sighting	Name of Person Making Report

Pest Management Response

Facility:_____

Area/Room	Pest Problem	Action Taken	Person Responsible	Date/Time

Pesticide Application Log

School/Pest Control Company Name_____

Note: Outdoor applications require additional information including weather conditions, location of sensitive areas, and equipment calibration. For more information contact the BPC 207-287-2731.

Date	Time	Specific Location	Target Pest	Pesticide Product Name and Diluent Applied	EPA Reg. No.	Active Ingredient	Application Method	Concentration and Amount	Applicator Name & License #

IPM Inspection Checklist

School Name:_____ **Date/Time of Inspection:**_____ **Inspector:**_____

Building Exterior	**Satisfactory**	**Unsatisfactory**	**Comments for Facilities/Maintenance**
Garbage storage area	_____	_____	_____
Garbage handling system	_____	_____	_____
Perimeter walls	_____	_____	_____
Roof areas	_____	_____	_____
Parking lot and/or drainage areas	_____	_____	_____
Weeds and surrounding landscape	_____	_____	_____
Rodent-proofing	_____	_____	_____
Other_____	_____	_____	_____
Building Interior			
Walls	_____	_____	_____
Floors	_____	_____	_____
Ceilings	_____	_____	_____
Floor drains	_____	_____	_____
Lighting	_____	_____	_____
Ventilation/Air handling equipment	_____	_____	_____
Other_____	_____	_____	_____
Food Storage			
Dry food storage area	_____	_____	_____
Damaged/spoiled dry food	_____	_____	_____
Empty container storage	_____	_____	_____
Refrigerated areas	_____	_____	_____
Overall sanitation	_____	_____	_____
Other_____	_____	_____	_____

IPM Inspection Checklist

Food Prep/Distribution Areas	Satisfactory	Unsatisfactory	Comments for Facilities/Maintenance
Counter and surface areas	_____	_____	_____
Food serving lines	_____	_____	_____
Spaces around appliances/equipment	_____	_____	_____
Other_____	_____	_____	_____
Other Kitchen Areas			
Dishwashing areas	_____	_____	_____
Garbage/Trash areas	_____	_____	_____
Tray return area	_____	_____	_____
Storage areas for pots/pans/plates	_____	_____	_____
Other_____	_____	_____	_____
Utility Areas and Bathroom			
Sinks and waterclosets	_____	_____	_____
Custodian's closet/work area	_____	_____	_____
Other_____	_____	_____	_____
Lunchroom area			
Tables/Chairs	_____	_____	_____
Office areas	_____	_____	_____
Vending machine area	_____	_____	_____
Other_____	_____	_____	_____

Recommendations to staff and faculty to aid in pest control:

Detailed Inspection Log

School:	Date:	Time:
Area/Room Inspected:	Person Monitoring:	
Previous Problems:	Action Taken:	
Pests Observed and Estimated Number:		
Conditions Found: (i.e. sanitation problems, structural deficiencies)		
Recommended Actions:		
Assigned To:		
Comments:		

IPM Monitoring Form

Facility:_____ Date: _____ Time:_____

Person Monitoring:_____

Area	Pest Problem Found	Conditions	Recommendations

Trap and Bait Monitoring Form

Building:_____ **Person Monitoring:**_____

Trap Type	#	Room # or Name	Date Trap Set	Date Trap Checked	Trap Missing?	Location Description	Number of Specimens

Planning and Notification Templates

The IPM Policy Statement & Sample Plan 143

Notification Requirements and Suggested Templates 145

School IPM Plan Worksheet 151

Sample IPM Plan 153

Sample Parent Letter Regarding IPM Program 158

Contracting for Pest Management Services 159

Sample Contract Specifications for Integrated Pest Management in Schools 161

Pesticide Application Signs 166

IPM Policy Statement

The School IPM Policy Statement:

- describes the reasons for implementing an IPM program.
- outlines the objectives of the IPM program.
- emphasizes the importance of IPM.
- provides incentive to school staff to actively implement appropriate IPM procedures.

A Sample Policy Statement

Pests can pose significant problems to people, property, and the environment. Pesticides pose similar risks. Children spend a great deal of time in schools and face greater potential for health effects resulting from pest and pesticide exposure. By reducing reliance on pesticides and incorporating low-risk control options, IPM reduces both pests and pesticide risks. It is therefore the policy of this school to incorporate integrated pest management (IPM) procedures for controlling pests.

Integrated pest management procedures. IPM incorporates the most practical and least hazardous combination of cultural, physical, biological, and/or chemical controls to prevent unacceptable levels of pest activity and damage. The school will develop a site plan for each locality on school property that may experience pest problems. These plans will incorporate IPM and specific management tactics.

The full range of management options, including no action at all, will be considered. The choice of using a pesticide is based on a review of all other available options and a determination that these options are not acceptable or are not feasible. Nonchemical pest management methods are used whenever possible. Direct action will be used only when specific pest thresholds are reached. When it is determined that a pesticide must be used, the least hazardous material and method of application will be chosen. Pesticide applications will be timed to minimize their impact on school grounds. All pesticides will be handled according to state and federal law.

Pest management objectives:

- Maintain a safe and sustainable school environment.
- Protect human health by suppressing pests that threaten public health and safety.
- Reduce the exposure of humans—particularly children—to pesticides.
- Reduce or prevent pest damage to school properties.
- Reduce environmental pollution.
- Reduce the costs of pest management.
- Prevent pests from spreading beyond school property.
- Enhance the quality of life for students, staff, and others using school property.

IPM coordinator. The school will appoint a staff member to be the IPM Coordinator with the following duties:

- Coordinates IPM activities and individual responsibilities.
- Records all pest sightings by school staff and students.
- Records all pesticide use and makes those records available.
- Coordinates management activities with pest control contractors, or licensed staff.
- Makes pesticide labels and material safety data sheets for all products applied available.
- Approves appropriate pesticide applications—methods, materials, timing, and location.
- Assures that all of the pest control contractor's recommendations on maintenance and sanitation are carried out where feasible.
- Posts and notifies when pesticides are to be applied.
- Evaluates the school's progress with the IPM plan.
- Ensures that pesticides are only used by licensed applicators.

Education. The school community will be educated about potential pest problems and IPM methods used to achieve the pest management objectives.

Record keeping. Pest sighting data sheets and pest control records will be kept current and accessible to verify the need for treatments and track the effectiveness of management activities. Pesticide records shall be maintained on site and meet the requirements of the Maine Board of Pesticides Control.

Notification/posting. A notice will be provided to school staff, students, and parents at the beginning of each school year briefly explaining the school's pesticide use policy. The notice must explain how the school will provide written notification at least 5 days before each high-risk pesticide application done during the regular school year and how signs will also be posted two working days before until 48 hours after high-risk treatments are applied any time of year.

Pesticide purchase and storage. Pesticide purchases will be limited to the amount needed for use during the year. Pesticides will be stored in an appropriate, secure site that is not accessible to students or unauthorized personnel and will be disposed of in accordance with label directions and state regulations.

Pesticide applicators. Any person applying pesticides on school grounds will be trained in the principles and practices of IPM and licensed by the state to apply pesticides. Applicators must follow state regulations and label precautions and must comply with the school IPM policy and pest management site plans.

Notification Requirements

Within the first two weeks of every school year:

- All school staff and parents or legal guardians are informed that pesticides may periodically be applied in school buildings and on school grounds.
- All school staff and parents or legal guardians are notified that a school integrated pest management policy exists and where it may be reviewed.
- All school staff and parents or legal guardians are informed that a report of prior pesticide applications, information about the pesticides used, and a copy of the state law, *Standards for Pesticide Applications and Public Notifications in Schools,* are available for review.
- All school staff and parents or legal guardians of students receive notification of pesticide applications as required by law. There are two options:
  - **Universal notification option.** Notification of pesticide application is sent in a news letter, bulletin, calendar, or other correspondence that will reach all parents and staff.

    OR
  - **Registry option.** The school establishes a notification registry whereby persons wishing notification make a written request to be on a list to receive notice whenever non-exempt pesticide applications are performed.

For each non-exempt pesticide application:

- Notification is sent at least five days prior to the pesticide application.
- Written notification includes:
  - The trade name and EPA Registration number of the pesticide to be applied.
  - The approximate date and time of the application.
  - The location of the application.
  - The reasons for the application.
  - The name and phone number of the person to whom further inquiry may be made.
- The treated area is posted as required. See the Appendix for more information.

The following pesticide uses are exempt from notification requirements:

- Non-powered application of ready-to-use general use pesticides to control stinging or biting insects when they threaten the health or safety of a student, staff member or other occupant.
- Non-powered application of general use antimicrobial products to interior or exterior surfaces and furnishings during the course of routine cleaning procedures.
- Application of paints, stains or wood preservatives that are classified as general use pesticides.
- Non-volatile liquids injected into cracks, crevices or wall voids.
- Non-volatile baits, gels, pastes, and granular materials placed in areas inaccessible to students.
- Indoor or outdoor applications performed when school is not in session and will not be in session until the re-entry or restricted entry interval specified on the pesticide label has elapsed.
- Indoor application of a pesticide with no re-entry or restricted entry interval specified on its label but entry to the treated area is restricted for at least 24 hours.

Suggested School Pesticide Policy Notification Template

- Universal Notice Option -

This document is available at www.thinkfirstspraylast.org/schoolipm. The Maine School Management Association, www.msmaweb.com, offers other templates to school superintendents and school boards.

Note: Schools must use either 'Universal Notification' to notify all parents, guardians, and staff in advance of each planned pesticide application OR 'Registry Notification' to notify only those whose names are on the school's Pesticide Notification Registry. The suggested letter on this page is for 'Universal Notification.'

Dear Parent, Guardian, or Staff Member,

I am writing about three subjects that can affect children's health in school: pests, pesticides, and your right to know.

Pest Control

Because pesticides pose risks, the school uses an alternative approach to merely applying pesticides. Control of insects, rodents, and weeds at our school focuses on making the school buildings and grounds an unfavorable place for pests to live and breed. Through maintenance and cleaning, we will reduce or eliminate available food and water sources and hiding places for the pests. We will also routinely monitor the school area to detect pest problems and prevent the pests from becoming established. Some techniques we will use include pest monitoring, sanitation, pest exclusion, proper food storage, pest removal, and—as a last resort—pesticides. This holistic approach is often called integrated pest management (IPM).

Pesticide Use

Sometimes pesticide use may be necessary to control a pest problem. When that happens, the school will use the lowest risk products available. If higher risk pesticides must be used, notices will be posted at application sites and parents, guardians, and staff have a right to know.

Your Right to Know

Parents, legal guardians, and school staff will be notified of specific pesticide applications made at the school. Notification will be given at least five days before planned pesticide applications. Pesticide application notices will also be posted in school and on school grounds. Notification need not be given for pesticide applications recognized by law to pose little or no risk of exposure to children or staff.

The school also keeps records of prior pesticide applications and information about the pesticides used. You may review these records, a copy of the school's integrated pest management policy and the Maine Board of Pesticides Control Regulation CMR 01-026 Chapter 27 by contacting our IPM coordinator, _____, at _____.

If you have any questions, please contact_____. For further information about pests, pesticides and your right to know, call the Board of Pesticides Control at 207-287-2731 or visit the Maine School IPM web site at www.thinkfirstspraylast.org/schoolipm.

Sincerely,

Suggested School Pesticide Policy Notification Template

- Registry Option -

This document is available at www.thinkfirstspraylast.org/schoolipm. The Maine School Management Association, www.msmaweb.com, offers other templates to school superintendents and school boards.

Note: Schools must use either 'Universal Notification' to notify all parents, guardians, and staff in advance of each planned pesticide application OR 'Registry Notification' to notify only those whose names are on the school's Pesticide Notification Registry. The suggested letter on this page is for 'Registry Notification.'

Dear Parent, Guardian, or Staff Member,

I am writing about three subjects that can affect children's health in school: pests, pesticides, and your right to know.

Pest Control

Because pesticides pose risks, the school uses an alternative approach to merely applying pesticides. Control of insects, rodents, and weeds at our school focuses on making the school buildings and grounds an unfavorable place for pests to live and breed. Through maintenance and cleaning, we will reduce or eliminate available food and water sources and hiding places for the pests. We will also routinely monitor the school area to detect pest problems and prevent the pests from becoming established. Some techniques we will use include pest monitoring, sanitation, pest exclusion, proper food storage, pest removal, and—as a last resort—pesticides. This holistic approach is often called integrated pest management (IPM).

Pesticide Use

Sometimes pesticide use may be necessary to control a pest problem. When that happens, the school will use the lowest risk products available. If higher risk pesticides must be used, notices will be posted at application sites and parents, guardians, and staff have a right to know.

Your Right to Know

Parents, legal guardians, and school staff will be notified of specific pesticide applications made at the school. To receive notification, you must be placed on the notification registry by sending in the attached 'Request to be Notified of Planned Pesticide Applications.' Notification will be given at least five days before planned pesticide applications. Pesticide application notices will also be posted in school and on school grounds. Notification need not be given for pesticide applications recognized by law to pose little or no risk of exposure to children or staff. The school also keeps records of prior pesticide applications and information about the pesticides used. You may review these records, a copy of the school's integrated pest management policy and the Maine Board of Pesticides Control Regulation CMR 01-026 Chapter 27 by contacting our IPM coordinator, _____, at _____.

If you have any questions, please contact_____. For further information about pests, pesticides, and your right to know, call the Board of Pesticides Control at 207-287-2731 or visit the Maine School IPM web site at www.thinkfirstspraylast.org/schoolipm.

Sincerely,

Request to be Notified of Planned Pesticide Applications

This document is available at www.thinkfirstspraylast.org/schoolipm. The Maine School Management Association, www.msmaweb.com, offers other templates to school superintendents and school boards.

_____ School

I am a parent, legal guardian, or staff member of this school and I want to be notified before specific pesticide applications are made at the school or on the school grounds, except for the following exempt applications:

1) Non-volatile liquids injected into cracks, crevices or wall voids.
2) Non-volatile baits, gels, pastes, and granular materials placed in areas inaccessible to students.
3) Paints, stains, and wood preservatives.
4) Disinfectants used for routine cleaning.
5) Non-powered applications of ready-to-use general use pesticides to control or repel stinging or biting insects where there is an urgent need to protect the health or safety of a student, staff member, or other school occupant.
6) When school is not in session and will not be in session until the re-entry time specified on the pesticide label has elapsed.
7) Indoor applications of a pesticide with no re-entry interval specified on its label but entry to the treated area is restricted for at least 24 hours.

I would prefer to be contacted by (circle one): U.S. Mail E-mail Telephone

Name:_____

Date:_____

Mailing Address:_____

_____

_____

Daytime Phone:_____ Evening Phone:_____

E-mail:_____

Return this form to:

IPM Coordinator
School Address
City/Town, Zip

Suggested Notice of Planned Pesticide Application

This document is available at www.thinkfirstspraylast.org/schoolipm. The Maine School Management Association, www.msmaweb.com, offers other templates to school superintendents and school boards.

Dear Parent, Guardian or Staff Member;

I am writing to let you know that a pesticide with the trade name _____, and the EPA registration number _____, is scheduled for application on _____(*date*), at the specific location of _____ _____. This is being done to help manage _____ *(name of pest)* as part of our Integrated Pest Management Program to insure a healthy school environment. Signs will be posted at access points and at this central location _____ _____ at least two working days prior to application, and will remain posted for 48 hours after the application. This notice is being provided at least five days prior to the planned pesticide application in accordance with our school's integrated pest management policy and in compliance with Maine Board of Pesticides Control Regulation CMR 01-026 Chapter 27.

For further information regarding this action please contact the IPM Coordinator _____ at _____.

Sincerely,

School IPM Plan Worksheet

Use this worksheet to develop a detailed description of *how* IPM will be used to meet each of the school's pest management goals. Use structured, organized, and sensible methods to identify *who* will be responsible for each part of IPM implementation and administration, and *what* criteria will be used to measure and assess the effectiveness of the IPM program. Set a timeline for accomplishing your goals. Although this worksheet may be used to develop an IPM plan for the entire school department, include components that address each specific school and each specific pest problem. Items that are already included are for explanatory purposes and may be adapted as necessary.

Goals:

- Compliance with state regulations
- Provide healthy and safe environment for working and learning
-

Will guidance and communication be provided by an IPM committee? If so, list names and job titles of members.

Who will keep records and how:

1. Regular inspection to identify needs

2. Assessment of costs and risks of those needs and set priorities for addressing them

3. Monthly, weekly, and/or daily pest monitoring for high risk and troublesome pests

Indoors:

- Rodents
- Cockroaches
- Greenhouse pests
- Other indoor pests
-

Outdoors:

- Wasps
- Rodents (entering building or hanging around dumpsters)
- Turf pests
- Mosquito and tick habitats
- Other outdoor pests

Who and how will pest monitoring, inspection, and pesticide-use records be maintained and made available?

How will pest and pesticide-use activities be communicated to assure that the IPM plan is followed?

Steps that will be taken to control unauthorized pesticide use by:

- School staff
- Volunteers
- Municipal staff
- Contractors
-

How/who/what will be done in the event of a pest or pesticide-related emergency?

- Wasps indoors
- Wasps, stings, and anaphylaxis
- Suspected or known pesticide poisoning
-

Pest control and other service contracts:

What steps will be taken to ensure that services provided by contractors meet all requirements of this plan and state regulations?

What provisions will be made for parent/staff notification and posting?

Staff training:

How will IPM training and education be provided to staff and students?

Performance measures

- Report cards?
-
-

Timeline for accomplishing performance goals:

Sample School Integrated Pest Management Plan

This sample assumes the use of a commercial contractor but many schools are capable of in-house pest management.

General School Information

School Name: *Cobanacook Middle School*
Address: *10 Main St., Augusta, ME 04333*
Telephone Number: *207-222-2222*
E-Mail: *cobanschool@sad0.k12.state.me.us*
Plan Prepared By: *Iman Charge, Principal*
Date: *18 April 2002*

School IPM Coordinator

Name: *Kerr D. Nader*
Title: *Facilities Director*
Telephone Number: 207-222-2222 ext. 2
E-Mail: kdn@sad0.k12.state.me.us

School IPM Committee or Team

School IPM Coordinator(Chair)
Facilities Director
Principal
Food Service Director
Head Custodian
School Nurse
Teacher
Student
PTO Representative
Pest Control Contractor

School IPM Policy

The Cobanacook Middle School desires to prevent unnecessary exposure to children and employees to pesticides and reduce the need to rely on pesticides when managing pests. It is the policy of Cobanacook Middle School to only use pesticides when pests have been identified and their presence verified. Selection of treatment options or corrective actions will give priority to least-risk actions whenever possible to provide the desired control of pests. Education of staff, students, employees, and parents about IPM will be included to achieve desired objectives.

When it is determined that pesticides are needed, only products registered for use in Maine will be used, and they will only be used in strict accordance with the product label. Further, only individuals properly licensed by the Maine Board of Pesticides Control will use pesticide products. Our policy prohibits the use of any pesticide by unlicensed staff *except* to control stinging insects that pose an imminent threat to human health on school grounds, as well as the use of disinfectants for routine cleaning, and the application of paints, stains, and wood preservatives.

It will be this school policy to make the appropriate notification and posting as well as to keep records of all pesticide use and other pest control actions. A copy of our full school IPM policy statement and this school IPM plan will be maintained in the principal's office and available upon request.

School Pest Problem(s) Description

Cobanacook School has historically applied pesticides to control pavement ants, German cockroaches, bald-faced hornets, dandelions, and knot weed. The locations in the school where these pests have been problematic are:

- Pavement ants - kitchen, pantry, classrooms along the East Wing, the teachers room, and the boys locker room.
- House mice - kitchen, pantry, and basement.
- German cockroach - kitchen, teachers room, under vending machines in cafeteria.
- Bald faced hornets - usually build nests in shrubs in front of main building, posing risks of stings from late summer until cold weather kills them in late fall.
- Dandelions - in all lawns.
- Knot weed - spreading aggressively in the goal areas of the soccer field.

Inspection and Monitoring by School Staff

Annual Inspections: Our IPM coordinator (along with pest management contractor and other appropriate school staff such as food service director, business manager, or head custodian) will perform a thorough inspection annually to identify problems and corrective actions needed to prevent and/or manage pest infestations.

The IPM coordinator will provide the IPM committee with an annual report identifying conditions that are contributing to our pest problems. The committee will work with the coordinator to plan and schedule corrective actions.

Regular Pest Monitoring: For current, recent, or likely pests, a monthly monitoring program to detect pest infestations will be established as follows:

Mice: Non-pesticide baited rodent traps are in locked and secured stations in the pantry, kitchen, and basement. They are checked and emptied daily.

Ants and Cockroaches: Sticky cardboard monitors will be replaced monthly under the sinks and dishwasher, along the south wall, and behind the ovens and vending machines to monitor for ants and cockroaches in the kitchen and cafeteria and under shelving units in the pantry.

All Other Pests: Monthly monitoring by visual inspection will be done by designated staff indoors during school year and outdoors during spring, summer and fall months.

Reporting: Monthly monitoring reports will be generated and kept on file by the IPM coordinator.

Pest Sighting Log: Pest sighting sheets will be distributed to teachers and staff on which they may report pest activity sightings, including the identification of the pest (if known), number seen, other evidence (such as animal droppings), date, time, and location. A 3-ring binder holding the pest sighting report sheets will be kept in the main office in an accessible location. The IPM coordinator will check for new pest sighting reports daily.

Pest Identification: When pests are detected, the specific identification of the pest will be obtained by the IPM coordinator using professional resources such as University of Maine Cooperative Extension or other resources as necessary.

Inspection and Monitoring by Professional Pest Control Contractor

The IPM coordinator will meet directly with the pest control contractor every month to discuss monitoring reports. Bug Guy, Pest Control Contractor, will respond to the log complaints. If any sanitation, structural, or operation changes are noted, it will be written in the log along with recommendations for remediation. Specific service reports will also be placed in the log book documenting particular actions taken by Bug Guy.

Staff, teachers, and students will be instructed on how to log pest sightings and be given a brief overview on pest identification and the conditions that promote the pests. Pamphlets and fact sheets will be made available at the time of training and or posted on bulletin boards in specific areas such as the cafeteria and teacher's lounge.

Pesticide Use and Storage

Bug Guy is our licensed pesticide contractor (License. # 16983). The only pesticides used indoors are gel baits (MaxForce Roach Killer) EPA Reg # 2243-188.

For emergency situations, Wasp Freeze 'Em Dead REG # 3344-789 will be used to control stinging insects. All school staff will be trained on emergency response to stinging insects and custodial staff will be trained on the proper use of Wasp Freeze 'Em Dead to destroy stinging insect nests that

pose an imminent threat to the health of school occupants. Custodial staff will also receive annual training on the use and storage of disinfectants, paints, stains, and wood preservatives.

A copy of the product label and material safety data sheet for every pesticide product used or stored at the school will be kept in an accessible location in the main office and will be provided upon request.

All appropriate steps will be taken to ensure complete compliance with state laws prohibiting unlicensed persons from using any pesticide product on school property including ant cups, insect sprays, weed killers, and weed and feed lawn care products. The only exceptions are emergency control of stinging insects, disinfectants used for routine cleaning, and paints, stains, and wood preservatives.

Non-Chemical Pest Prevention and Management

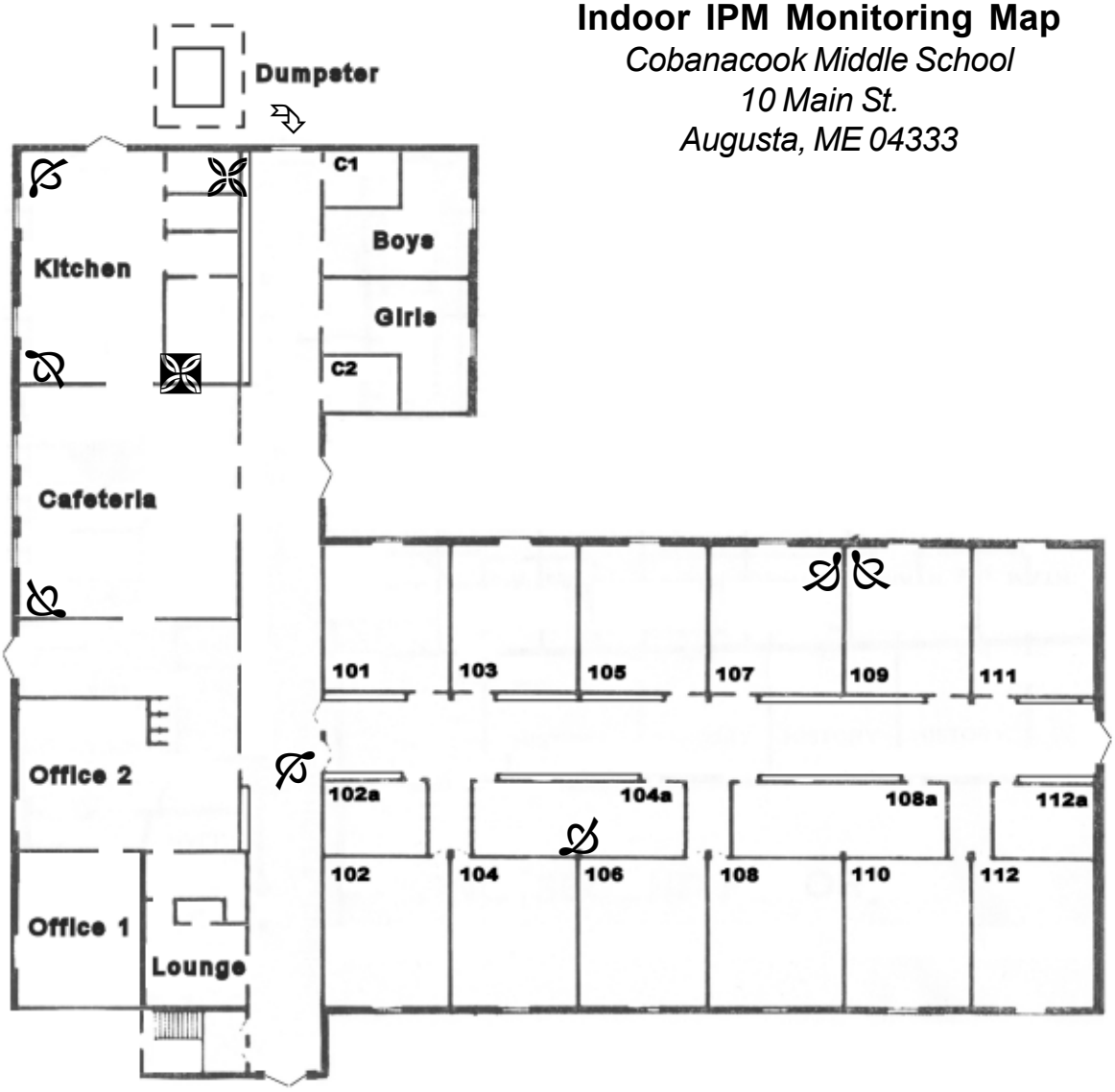
Whenever practical, the Cobanacook Middle School will minimize the use of pesticides to control or limit pests. Along with sanitation and maintenance actions to eliminate food, water, shelter, and entryways for pests, non-pesticide traps will be used to reduce pests when practicable and effective. Proper cultural practices for minimizing impacts of weeds, plant diseases, and other pests outdoors on school grounds will also be employed. Specific practices we will use to prevent pest problems are described on the attached checklist.

School IPM Program Evaluation

Our school IPM plan will be evaluated every four months and at least once a year. The IPM committee or team will meet with our pest control contractor to evaluate the effectiveness of the IPM program and to develop needed improvements.

Indoor IPM Monitoring Map

Cobanacook Middle School
10 Main St.
Augusta, ME 04333



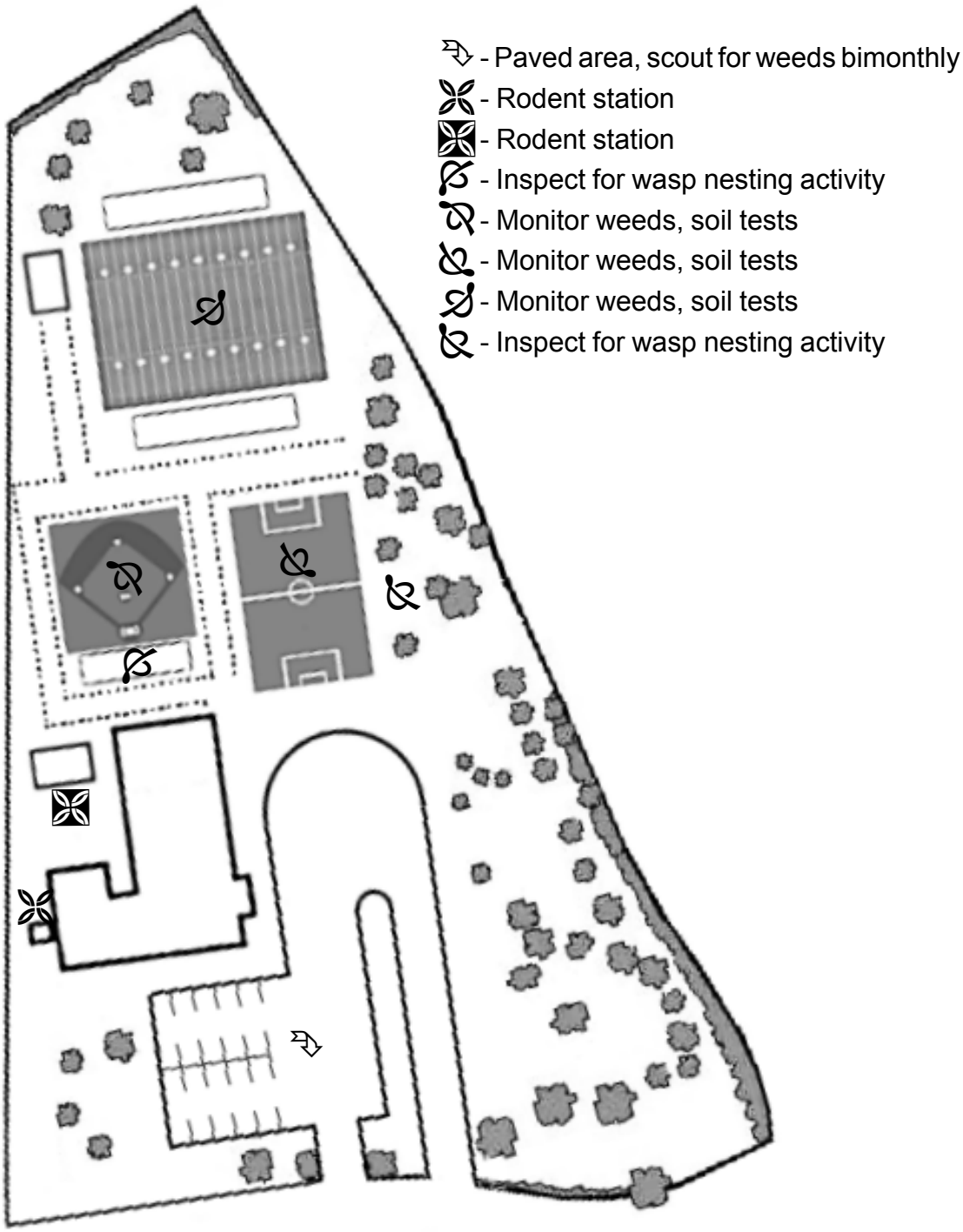
Monitoring traps:

- Rodent trap
- Rodent trap
- Rodent trap
- Insect sticky trap
- Insect sticky trap
- Insect sticky trap
- Insect sticky trap
- Insect sticky trap
- Rodent trap
- Insect sticky trap

Use your school map to locate and identify all monitoring devices. Record all observations and trap servicing on a separate form.

Oudoor IPM Monitoring Map

Cobanacook Middle School
10 Main St.
Augusta, ME 04333



Use your school map to locate and identify all monitoring devices. Record all observations and trap servicing on a separate form.

Sample Letter for Parents Regarding IPM Program

Dear Parent or Guardian,

I am writing about our program aimed at keeping our schools healthy and pest free. This program is geared toward preventing pest problems using alternative approaches to pesticides. I want to let you know how you can help.

Control of insects and rodents at our school involves making the school building and grounds an unfavorable place for pests to live and breed. Through maintenance and cleaning, we will reduce or eliminate available food and water sources and hiding places for pests. We will also routinely monitor the school area to identify pest problems and prevent pests from becoming established. In addition to cleaning and monitoring, we will use other strategies such as pest exclusion, proper food storage, pest removal, and, as a last resort, pesticides. This approach is often called integrated pest management (IPM) because it relies on a variety of best management strategies to control pests. Some of these methods can be used to keep pests out of homes and gardens too.

You may be wondering how you can help. Listed below is a list of actions you can take that will help prevent or reduce pest problems in our school. Pest management involves everyone in the school-community working together to make our school a safe, healthy place for children to learn.

Checklist:

- ❑ Talk with your child about not sharing hats, combs, etc. to avoid head lice.
- ❑ Explain the importance of not leaving food in desks and lockers to avoid pests such as mice and ants.
- ❑ Send your child to school with only one day's worth of food.
- ❑ Know where to find information about integrated pest management at your child's school.
- ❑ Avoid sending insect repellents to school with your child.
- ❑ Assist your child in keeping his/her backpack clean and organized.
- ❑ Notify the school of any health related concerns.

Please contact me if you have any questions.

Sincerely,

IPM Coordinator
Phone:
E-mail:

Contracting Pest Management Services

Regular school employees can conduct successful IPM programs by themselves, or by working with a contracted pest control company. Individual school systems must decide what is best given their unique circumstances. Hiring a pest control firm may increase costs, but may also reduce the staff time involved in pest management and eliminate the need to store pesticides. As with any contract, it is beneficial for school administration and staff to understand the process of the services provided to ensure quality service at a fair price. Before choosing a pest control firm, contact the Better Business Bureau and state regulatory agency to see if they have received complaints about a particular company. A sample contract follows this section.

Pest Management Contracts

Whether you use in-house or contracted services, pest management personnel should be trained to:

- Understand the principles of IPM.
- Identify pests and associated problems or damage.
- Monitor and inspect for pests and signs of pests,
- Use and maintain pest-sighting, monitoring, and pesticide-use records in the school logbook,
- Know cultural or alternative methods of pest control.
- Know recommended methods of judicious pesticide application.
- Know the hazards of pesticides and the safety precautions to be taken.
- Know the pesticide label's precautionary statement(s) pertaining to exposure to humans or animals.

Pest management contracts should clearly establish:

- The goals of the IPM program.
- What services are provided and how they are implemented.
- Posting and notification responsibilities.
- Consultation with the IPM coordinator.
- The population levels of specific pests that can be tolerated without treatment.
- Appropriate least-hazardous procedures to correct pest problems.
- The restrictions on pesticide use: types of applications, timing of applications, restricted locations, materials that can be used.
- The pest management actions that are the responsiblity of the school district.

Any special health concerns (such as those for children, or for individuals with allergies, etc.) should be noted and whether certain pesticides are excluded from use. In advance of any pesticide treatments, applicators should be required to inform the IPM coordinator of the reasons for treatment (action threshold, failure of non-chemical control, etc.). Pesticide applications must also allow time for the required notices.

The pest control company should have a copy of the school's IPM policy and should thoroughly inspect the school building and grounds before starting service. The company should prepare a map of the school building and grounds to indicate potential problem areas, and mark locations of monitoring devices and traps.

Pest management professionals can monitor and inspect while school is in session, but pesticide applications should not be made if school children or other people are present. In some cases, certain areas of a building may need to be blocked off and ventilation systems isolated before applying pesticides to keep people from entering the treated area.

Vending Machine Contracts

The only method schools can rely on to enforce good sanitation practices by vendors is specific language in their contracts. Vending machine contracts should specify regular maintenance service, cleaning under and behind machines during service visits, and immediate correction of problems, which may foster pests (e.g. breakage, leaks or excessive condensation from machinery).

Waste Disposal Contracts

Food residue and debris in dumpsters is a source of food for rodents and insects and should not be allowed to accumulate. Disposal contracts should require that dumpsters be cleaned and sanitized regularly. The frequency varies with the type of materials stored in the dumpster, the season, etc. Waste should never overflow, and lids should always remain closed. Any rubbish spilled during pick-up should be cleaned up immediately.

Disposal contracts should require that vendors regularly clean dumpsters.

Disposal contracts should clearly stipulate the type of container to be provided and that it is appropriate for the intended purpose. For instance, containers used for food waste should be sealed and sized appropriately for the amount of waste generated. Dumpsters should be placed as far away from the school building as practical.

Most dumpsters have a drainage hole that is large enough for rats and mice to enter. Contracts should stipulate that all dumpsters be fitted with drain hole plugs, and that they be kept in place whenever the dumpster is not being drained.

Anyone making pesticide applications in Maine schools must be licensed by the Board of Pesticides Control.

Sample Contract Specifications for Integrated Pest Management in Schools

This guide, adapted from one provided by the Safer Pest Control Project (<http://www.spcpweb.org>), provides a general outline for bid specifications and school pest management contracts. This is a very extensive treatment and many elements will need revision to suit individual schools. An experienced contract officer or legal counsel should review any pest control contract to ensure compliance with pest management policy and state regulations.

1. General

A. Description of program: This specification is part of a comprehensive integrated pest management (IPM) program for the premises listed herein. IPM is a process for achieving long-term, environmentally sensitive pest suppression through the use of a wide variety of technological and management practices. Control strategies in an IPM program include monitoring, physical, cultural, biological, and procedural modifications that reduce the food, water, harborage, and access used by pests. Pesticides are used only as a last resort.

B. IPM coordinator: The school district will appoint a school employee as the IPM coordinator. The IPM coordinator will act as the manager of the IPM program including overseeing and monitoring contract performance.

C. Contractor service requirements:

i. The contractor shall furnish all supervision, labor, materials, and equipment necessary to accomplish the surveillance, trapping, pesticide application (when deemed necessary), and pest removal components of the IPM program.

ii. The contractor shall provide detailed, site-specific recommendations for any structural and procedural modifications needed to aid in pest prevention.

iii. The contractor shall provide evidence of sufficient expertise in pest control and IPM training and/or IPM experience to carry out these responsibilities. All contractors must be licensed by the Board of Pesticides Control.

iv. All services provided by the contractor will be in compliance will all relevant federal, state, and local laws.

2. Pests Included and Excluded

The IPM program specified in this contract is intended to manage pest populations in the contracted area including insects, plant diseases, rodents, etc. [*modify this point to suit the particular situation*].

3. Action Thresholds

Levels of pest populations or site environmental conditions that require remedial action by the contractor shall be determined by the contractor and the IPM coordinator. Action shall only be taken when a pest population exceeds the threshold and poses a problem and/or risk to school property and/or building inhabitants.

4. Initial Inspections

The contractor and the IPM coordinator shall conduct a thorough, initial inspection during the first month of this contract. The purpose of the initial inspection is for the contractor to evaluate the pest management needs of the property and discuss these with the IPM coordinator. Access to all areas shall be coordinated with the IPM coordinator. The inspection shall address:

- Identification of problem areas in and around buildings, on all athletic fields, and on playgrounds.
- Identification of structural features or sanitation problems contributing to pest infestations.
- Discussion of the effectiveness of previous control efforts.
- Facilitation of contractor access to all necessary areas.
- Information about restrictions or special safety precautions, or other constraints that the contractor should know.

5. Pest Management Plan

Following the initial inspection, the contractor will develop a detailed pest management plan and inspection schedule for each site. This must be submitted to the IPM coordinator for approval prior to initiation. The pest management plan shall consist of the following:

A. Inspection schedule for each building or site: Frequency of inspections, monitoring, and treatment by the contractor shall depend on the specific pest management needs of the premises and/or grounds. At a minimum, the contractor shall perform regularly scheduled inspections and monitoring to determine if remedial action is necessary.

B. Monitoring and inspection program: The contractor shall outline a monitoring and inspection program that includes proposed methods of surveillance and identification of infested areas, as well as an objective assessment of site environmental conditions and pest population levels. Monitoring and inspection shall be continued throughout the duration of this contract. Between visits from the contractor, the IPM coordinator will ensure that regular monitoring of pest prone areas takes place.

C. Description of site-specific pest control methods: The contractor shall describe physical, structural, operational, biological, and least-hazardous pesticide recommendations and actions to manage pest populations that exceed the established thresholds or other measures aimed at preventing pest infestations. The contractor shall use nonchemical methods wherever possible and shall minimize pesticide use.

D. Description of any structural or operational changes that would facilitate the pest management effort: The contractor shall provide the IPM coordinator with written recommendations for site-specific solutions for preventing future pest infestations or eliminating observed sources of pest food, water, harborage, and access.

E. Statements of the conditions considered necessary to allow pesticide application: *Pesticide applications shall be by need and not by schedule.* The contractor must obtain written permission from the IPM coordinator before using pesticides. [*Some schools may wish to list which pesticides require permission and those that do not*].

F. Proposed materials and equipment for service: The contractor shall provide current labels and *material safety data sheets* (MSD Sheets) for all pesticides used, and the brand names of rodent bait boxes, pest monitoring devices, pest surveillance and detection equipment, and any other pest control devices or equipment that may be used to provide service.

G. Commercial pesticide applicator licenses: The contractor shall provide photocopies of the business' pest control license and pesticide applicator licenses for every contractor employee who will be performing on-site service under this contract.

H. Notification and posting: The contractor shall work with the IPM coordinator to ensure full compliance with state notification and posting requirements.

6. Record Keeping

The IPM coordinator shall be responsible for maintaining a pest control logbook or file for each building or site specified in this contract. These records, or a copy of them, shall be kept on site. The

contractor shall be responsible for documenting each visit to the site and all services provided. This file shall include:

A. **Pest control plan**: A copy of the contractor's approved pest management plan, including labels and MSD sheets for all pesticides used and the contractor's inspection schedule.
B. **Pest sighting reports:** Pest monitoring data sheets that record the number and location of pests found by the contractor's monitoring program and sightings by school occupants.
C. **Work request and inspection forms:** Work request and inspection forms will be used to advise the contractor of routine service requests and to document the performance of all work, including emergency work. Upon completion of a service visit to the building or site, the contractor's employee performing the service shall complete, sign, and date the form, and return it to the logbook.
D. **Contractor's service report forms:** Customer copies of a contractor's service report form documenting all information on pesticide applications, including the location of all traps, trapping devices, and bait stations in or around the property.

7. Manner and Time To Conduct Service

A. **Time frame of service visits**: The contractor shall not perform routine pest control services during regular school hours. When it is necessary to perform work during school hours, the contractor shall notify the IPM coordinator at least one day in advance.
B. **Safety and health:**
   i. The contractor shall observe all safety precautions throughout the performance of this contract. All work shall comply with applicable state and municipal safety and health requirements. Where there is a conflict between applicable regulations, the most stringent will apply.
   ii. The contractor shall assume full responsibility and liability for compliance with all applicable regulations pertaining to the health and safety of personnel during the execution of work.
C. **Special entrance:** The contractor must coordinate access to restricted areas with the IPM coordinator.
D. **Uniforms and protective clothing:** All contractor personnel working in or around buildings designated under this contract shall wear distinctive uniform clothing. The contractor shall determine the need for and provide any personal protective items required for the safe performance of work. Protective clothing, equipment, and devices shall comply with FIFRA and the specific pesticide labels.
E. **Vehicles:** Vehicles used by the contractor shall be identified in accordance with state and local regulations.

8. Special Requests and Emergency Service

On occasion the IPM coordinator may request that the contractor perform corrective, special, or emergency service(s) that are beyond the routine service requests. The contractor shall respond to these exceptional circumstances and complete the necessary work within five working days after receipt of the request. In the event that such services cannot be completed within five working days, the contractor shall immediately notify the IPM coordinator and indicate an anticipated completion date.

9. Use of Pesticides

The contractor shall minimize the use of pesticides whenever possible. The ontractor shall not apply any pesticide that has not been included in the pest management plan or approved in writing by the IPM coordinator. Applications of nonapproved pesticides will be restricted to unique situations where no

alternative measures are available and all other options have been exhausted. The pesticides used by the contractor must be registered with the U.S. EPA, Maine BPC, and used in strict accordance with the manufacturer's label instructions and all applicable federal, state, and local laws and regulations. The contractor shall adhere to the following rules for pesticide use:

A. **Written permission to use pesticides:** The contractor will not use any pesticide without first obtaining written permission from the IPM coordinator and after monitoring indicates the presence of pests that exceed action thresholds and other control methods or actions have not reduced the pest population to below the action threshold. The contractor shall provide a written request explaining the need to use a pesticide. The request shall identify the target pest, the need for such treatment, the time and specific place of treatment, the pesticide to be used, the method of application, what precautions should be taken to insure school occupant safety, and the steps taken to ensure the containment of the spray to the site of application. If pesticide use is approved, the contractor shall employ the least-hazardous material, most precise application technique, and minimum quantity of pesticide necessary to achieve control.
B. **Timing of application:** The contractor will apply pesticides when areas are unoccupied and will remain unoccupied until the reentry period specified by the label.
C. **Notification procedures:** The IPM coordinator shall provide the contractor with information about the district's procedures for notifying parents, guardians, and staff about applicable pesticide applications. The contractor shall provide the IPM coordinator with sufficient advance notice of pesticide applications for the district to comply with the notification requirements.
D. **Pesticide storage**: The contractor shall not store any pesticide product on the premises listed herein.

10. Structural Modifications and Recommendations

Structural modifications for pest suppression will not necessarily be the responsibility of the contractor. The contractor shall be responsible for advising the IPM coordinator about any structural, sanitary, or procedural modifications that would reduce pest food, water, harborage, or access.

11. Controlling Invertebrates (insects, mites, spiders, etc.), Weeds, and Plant Disease

A. **Monitoring:** The contractor shall monitor pest populations and control efforts.
B. **Emphasis on nonpesticide methods:** The contractor shall use nonpesticide methods of control whenever possible.
C. **Bait formulations:** Bait formulations shall be used wherever appropriate. Bait shall be placed in areas inaccessible to children and other building occupants.
D. **Records:** The locations of all monitoring devices, bait stations, and other control devices shall be recorded in the pest control logbook.

12. Controlling Vertebrate Pests

A. **Indoor trapping:** As a general rule, vertebrate control shall be accomplished with trapping devices only. All such devices shall be concealed out of the general view and in areas inaccessible to children and in protected areas not affected by routine cleaning and other operations. The contractor or school employee authorized by the IPM coordinator must check trapping devices regularly. The contractor or school personnel shall properly dispose of vertebrates killed or trapped within 24 hours.
B. **Rodenticides:** Rodenticides will be placed in EPA-registered tamper-resistant bait boxes. Frequency of bait box servicing shall depend upon the level of rodent infestation. All bait

boxes shall be labeled and dated at the time of installation and each servicing. All bait boxes shall be maintained in accordance with EPA and Maine BPC regulations, with an emphasis on the safety of nontarget organisms.

C. **Records:** The locations of all traps, trapping devices, and bait boxes shall be recorded in the pest control logbook.

13. Quality Control Programs

The contractor shall establish a complete quality control program to assure the requirements of the contract are provided as specified. The program shall include at least the following items:

A. **Inspection system:** The contractor's quality control inspection system shall cover all the services stated in this contract to detect and correct deficiencies in the quality of services before the level of performance becomes unacceptable and/or the IPM coordinator identifies the deficiencies.

B. **Checklist:** A quality control checklist shall be used in evaluating contract performance during regularly scheduled and unscheduled inspections.

C. **File:** A quality control file shall contain a record of all inspections conducted by the contractor and any corrective actions taken. The file shall be made available to the IPM coordinator upon request.

D. **Inspector(s):** The contractor shall state the name(s) of the individual(s) responsible for performing the quality control inspections.

CAUTION

PESTICIDE APPLICATION NOTICE

DATE & TIME OF APPLICATION ♦

PRODUCT & EPA REGISTRATION NO. ♦

RE-ENTRY PRECAUTIONS ♦

LOCATION OF APPLICATION ♦

REASON FOR APPLICATION ♦

CONTACT NAME AND PHONE NO. ♦

CAUTION

PESTICIDE APPLICATION NOTICE

DATE & TIME OF APPLICATION ♦

_____

PRODUCT & EPA REGISTRATION NO. ♦

_____

RE-ENTRY PRECAUTIONS ♦

_____

LOCATION OF APPLICATION ♦

_____

REASON FOR APPLICATION ♦

_____

CONTACT NAME AND PHONE NO. ♦

_____

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School IPM Resources

Maine School IPM Web Site
www.thinkfirstspraylast.org/schoolipm
Contact: Kathy Murray 1-207-287-7616

Phone Contacts

Location	Contact	Resource Area	Phone Number
UMaine	Jim Dill	IPM Coordinator	800-287-0279
UMaine	Clay Kirby	Insects	800-287-0279
UMaine	Bruce Watt	Plant Disease	800-287-0279
UMaine	Lois Stack	Horticulture	800-870-7270
UMaine	Soil Test Lab	Soil nutrition	207-581-2945
UMaine	Don Barry	Structural Pests	800-287-0279
ME Dept of Agriculture	Kathy Murray	School IPM	207-287-7616
ME Board of Pesticides Control	Gary Fish	Licensing & Training	207-287-2731

Pesticide Applicator Training Manuals

Available through the UMaine Pest Management Office, 800-287-0279

Title	Subject	Price
Turfgrass Pest Management	Athletic Fields, Lawns	$15.00
Outdoor Ornamental Pest Management	Trees, Shrubs, Flowers	7.50
Industrial, Institutional, Structural, and General Pest Control	Mice. Rats, Bees, Wasps	20.00
Industrial, Commercial, Municipal Vegetation Management	Weeds on sidewalks, driveways, fence rows	10.00

Manuals for School IPM

Order form available on website <*http://www.state.me.us/agriculture/pesticides/schoolipm/*>
or contact Maine School IPM Program, 207-287-2731

Outdoor Integrated Pest Management for Maine Schools	$10.00
Integrated Pest Management for Northeast Schools (Indoor Pests)	7.50
What's Bugging Our Schools? Pest Concerns and Pesticide Use in Maine Public Schools	free download
Pesticides in Schools Risk Reduction Starter Kit	free download

Pesticide Resources

Pesticide applicator certification and licensing, recertification training, pesticide diposal, pesticide spills, and pesticide regulations:

Maine Board of Pesticides Control
28 State House Station,
Augusta, Maine 04333-0028
207-287-2731
<http://www.thinkfirstspraylast.org>

Pesticide transportation, disposal, and spills:

Maine Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017
207-287-7688
800-452-1942
<http://www.maine.gov/dep/index.shtml>

Pesticide spills, reporting pesticide inventories:

Maine Emergency Management Agency
State House Station #72
Augusta, ME 04333
207-626-4503
800-452-8735
<http://www.state.me.us/mema>

The "worker's right-to-know" laws - the requirements of employers who work with pesticides:

Bureau of Labor Standards
45 State House Station
Augusta, Maine 04333-0045
207-624-6400
<http://www.maine.gov/laborstate.me.us/labor/bls/>

Federal pesticide regulations:

US Environmental Protection Agency, Region 1
1 Congress Street
Boston, MA 02114-2023
888-372-7341
<http://www.epa.gov/region01/eco/pest/>

Pesticide certification manuals, pesticide education and applicator training, pest identification, pesticide recommendations, and integrated pest management:

University of Maine Cooperative Extension Pest Management Office
491 College Avenue
Orono, Maine 04473-1295
207-581-3880
800-287-0279 (in Maine)
<http://www.pmo.umext.maine.edu/>

Pest Management Product Suppliers

Pesticide use in schools is subject to federal and state laws. You must be licensed to apply *any* pesticides in schools. For more information contact the Maine Board of Pesticides Control, 207-287-2731, www.thinkfirstspraylast.org. *This list does not constitute an endorsement of any company or product listed, nor is it intended to be a comprehensive listing.*

General Supplies

Gempler's - A variety of pest control equipment.
<*http://www.gemplers.com*>
800-332-6744 - catalog.

Bio-Integral Resource Center (BIRC)
<*http://www.birc.org*>
510-524-2567

Sealants and Caulks

Grainger - Industrial equipment from adhesives to tools.
<*http://www.grainger.com*>

Professional Pest Management Tools

Professional Equipment - Tools for home inspectors, PCO's, and facility professionals including moisture meters, pest detection devices, magnifying glasses, and more.
<*http://www.professionalequipment.com*>

Cleaners

American Bio-Systems - Biological pest controls.
<*http://www.bio-systems.com*>

Biostim Inc. - Markets microbes that eat the fats, oils, greases, and organics directly from your drains, drain lines, grease traps, and septic systems.
<*http://www.biostim.com*>

Door Sweeps and Weather Stripping

Aubuchon Hardware - A good selection of replaceable door sweeps and possibly a local store.
<*http://www.aubuchonhardware.com*>

Insect Monitors and Traps

UPMA Labs - IPM supplies to schools and other sensitive environments, including well-packaged kits for training and monitoring.
<http://www.ipmproducts.com>

Residex - Full service for pest management professionals—pesticides, tools, MSDS and label database.
<http://www.residex.com>
800-526-4222

Biocontrol Network - Pantry traps, biological drain cleaners, fruit fly traps, and more.
<http://www.biconet.com>

Fly and Wasp Control

B&G Chemical & Equipment - A pest control industry supplier.
<http://www.bgchem.com>
678-688-5601

Atlantic Paste & Glue, Inc. - Adhesive pest control products (rodent glueboards, etc.).
<http://www.catchmaster.com>
800-458-7454

Do-it-yourself Pest Control - A variety of pest products including bio-cleaners for drain flies.
<http://www.doyourownpestcontrol.com>

Grub Control

Extremely Green Gardening Co. - Beneficial nematodes for controlling lawn grubs, and more.
<http://www.extremelygreen.com>

Bird Control

Bird-X - A variety of environmentally safe bird control devices.
<http://www.bird-x.com>

Mouse Traps and Locking Bait Boxes

Bell Labs - A complete line of products to control rats and mice in any situation—rodenticides, tamper-resistant bait stations, non-poisonous glue boards, and mechanical mouse traps.
<http://www.belllabs.com>

Woodstream - Alternative pest control products for insects and rodents.
<http://www.woodstreampro.com>
608-241-0202

References and Websites for Implementing IPM in Schools

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Cacek, T.. ed. 2003. **The National Park Service Integrated Pest Management Manual, 2nd Ed.** National Park Service. Fort Collins, CO. (Available at <http://www.nature.nps.gov/biology/ipmmanual/ipmmanual.cfm>.)

City of Seattle. 2004. **Pesticide Reduction Program.** (Available at <http://www.cityofseattle.net/environment/pesticides.htm>.)

Daar, S., T. Drlik, H. Olkowski, and W. Olkowski. 1997. **IPM for Schools: A How-to Manual.** US Environmental Protection Agency, Region 9. San Francisco, CA. 213 pp. (Available at <http://www.epa.gov/pesticides/ipm/schoolipm/index.html>.)

Dame, D.A. and T.R. Fasulo. eds. 2003. **National Public Health Pest Control Manual.** (Available at <http://vector.ifas.ufl.edu/>.)

Dreistadt, S.H., J.K. Clark, and M.L. Flint. 2004. **Pests of Landscape Trees and Shrubs, 2nd. Ed.** 501 pp. University of California Division of Agriculture and Natural Resources. Publication No. 3359. (Available at <http://www.ipm.ucdavis.edu/IPMPROJECT/ADS/manual_landscape.html> $42.)

EPA. 1993. **Pest Control in the School Environment: Adopting Integrated Pest Management.** US Environmental Protection Agency. Washington, D.C. (Available at <http://www.epa.gov/pesticides/ipm/brochure/>.)

Fermanian, T.W., M.C. Shurtleff, R. Randell, H.T. Wilkinson, and P.L. Nixon. 2003. **Controlling Turfgrass Pests. 3rd ed**. Prentice Hall. Upper Saddle River, NJ. ($92).

Thomas A. Green, Ph.D. ed. 2003. **IPM Standards for Schools Tactics and Resources for Reducing Pest and Pesticide Risks in Schools and Other Sensitive Environments.** The IPM Institute of North America, Inc. (Available at <http://www.ipminstitute.org/pdf/ISS%20V3.1%20060603.pdf>.)

Hollingsworth, C.S. ed. 2000. **Integrated Pest Management Guidelines for Structural Pests: Model Guidelines for Training and Implementation.** 58 pp. (Available at <http://umassextension.bookstore.com/catalog/> $10.)

Hollingsworth, C.S. ed. 2002. **Integrated Pest Management for Northeast Schools.** (Available at <http://umassextension.bookstore.com/catalog/> $12.50.)

Illinois Department of Public Health. 1994. **Integrated Management of Structural Pests in Schools.** 24 pp. (Available in PDF format at <http://www.idph.state.il.us/envhealth/pdf/imsps.pdf>.)

Koehler, P., T. Fasulo, C. Scherer, and M. Downey. eds. 1999. **University of Florida School IPM Web Site.** <http://schoolipm.ifas.ufl.edu/>.

Maine Department of Agriculture. 2004. **Maine School IPM Program.** Kathy Murray, 207-287-7616. email: Kathy,murray@maine.gov. <http://www.thinkfirstspraylast.org/schoolipm>.

Maryland Department of Agriculture. 2001. **Integrated Pest Management in Schools: Contracting Guidelines for IPM Services in Maryland Public Schools.** 110 pp. (Available in PDF format at <http://www.mda.state.md.us/pdf/ipmcontr.pdf>.)

Maryland Department of Agriculture. 1995. **Guidelines for Integrated Pest Management (IPM) in Schools.** 11 pp. (Available in PDF format at <http://www.mda.state.md.us/pdf/ipmguide.pdf>).

National Clearing House for Educational Facilities. 2004. **Resource Lists: Pesticides and Integrated Pest management.** <http://www.edfacilities.org/rl/pests.cfm>.

Northwest Coalition for Alternatives to Pesticides. 2004. **School Pesticide Use Reduction Program.** <http://www.pesticide.org/schools01.html>.

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Pennsylvania State University. 2004. **Pennsylvania School IPM**. <http://paipm.cas.psu.edu/154.htm.

Safer Pest Control Project. 2004. <http://www.spcpweb.org/>.

School IPM. **The IPM Institute of North America, Inc.** 1914 Rowley Ave. Madison, WI 53705 USA. 608-232-1528. <http://www.ipminstitute.org/school.htm>.

School Pesticide Reform Coalition and Beyond Pesticides. 2003. **Safer Schools: Achieving A Healthy Learning Environment Through Integrated Pest Management.** 60pp. (Available in PDF format at <http://beyondpesticides.org/schools/publications/IPMSuccessStories.pdf>.)

Stauffer, S., R. Ferrentino, C. Koplinka-Loehr, K. Sharpe, and L. Braband. 1998. **IPM Workbook for New York State Schools.** IPM Publication No. 605. Cornell Cooperative Extension Community IPM Program. Geneva, NY. 55 pp. (Available in PDF format at <http://www.nysipm.cornell.edu/publications/school_wkbk/schoolwkbk.pdf>.)

Texas Structural Pest Control Board. 1999. **Integrated Pest Management in Schools.** <http://www.tda.state.tx.us/spcs/ipm/ipmindex.htm>.

University of California Statewide IPM Project. 2004. **How to Manage Pests in Homes, Gardens, Landscapes, and Turf.** <http://www.ipm.ucdavis.edu/PMG/menu.homegarden.html>.

University of Maine Cooperative Extension Pest Management Office. 2008. 1-800-287-0279 (Maine only). <http://pmo.umext.maine.edu/>.

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Vail, K. M. 1998. **Suggested Guidelines for Managing Pests in Tennessee's Schools: Adopting Integrated Pest Management.** University of Tennesee Agricultural Extension Service. Publication No. PB1603. Knoxville, TN. 38pp. (Available in PDF format at <http://www.utextension.utk.edu/publications/pbfiles/pb1603.pdf>.)

Resources for Teaching IPM in K-12 Classrooms

Maine Agriculture in the Classroom program. Willie Grenier, Coordinator, Maine Department of Agriculture. 207-287-7616.

Maine School Gardens Network. Mary Bird, University of Maine. 207-581-2434. email: mary.bird@umit.edu (please put "MSGN" in the subject line).

Maine Department of Education. Doug Robertson, Agriculture Specialist. 207-624-6744. email: doug.robertson@maine.gov. Anita Bernhardt, Science and Technology Specialist, 207-624-6835. email: anita.bernhardt@maine.gov.

University of Connecticut. K-8 Integrated Pest Management Curriculum. http://www.hort.uconn.edu/Ipm/curriculum/curricK_1.html>

Pennsylvania IPM Program. Resources for teachers. <http://paipm.cas.psu.edu/43.htm>.

University of Florida School IPM. Teaching Curriculum. <http://schoolipm.ifas.ufl.edu/teach.htm>.

Michigan State University. Elementary IPM Curriculum. <http://www.pested.msu.edu/CommunitySchoolIpm/curriculum.htm>

Keene State University. K-12 IPM Curriculum Modules. <http://academics.keene.edu/ipm/index.html>
mary.bird@umit.edu (please put "MSGN" in the subject line).

University of Maine Cooperative Extension County Offices

Androscoggin and Sagadahoc
24 Main St.,
Lisbon Falls, ME 04252-1507
Phone: (207)353-5550
or 1-800-287-1458 (in Maine)
FAX: (207)353-5558
andsag@umext.maine.edu

Aroostook
22 Hall St., Suite 101
Fort Kent, ME 04743-7131
Phone: (207) 834-3905
or 1-800-287-1421 (in Maine)
FAX: (207) 834-3906
cenas@umext.maine.edu

Houlton Road, PO Box 727
Presque Isle, ME 04769-0727
Phone: (207) 764-3361
or 1-800-287-1462 (in Maine)
FAX: (207) 764-3362
cecas@umext.maine.edu

Central Building
PO Box 8
Houlton, ME 04730-0008
Phone: (207) 532-6548
or 1-800-287-1469 (in Maine)
FAX: (207) 532-6549
cesas@umext.maine.edu

Cumberland
PO Box 9300,
15 Chamberlain Avenue
Portland, ME 04104-9300
Phone: (207) 780-4205
or 1-800-287-1471 (in Maine)
FAX: (207) 780-4382
cecmb@umext.maine.edu

Franklin
147 Farmington Falls Road, #2
Farmington, ME 04938-6403
Phone: (207)778-4650
or 1-800-287-1478 (in Maine)
FAX: (207)778-3982
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cefrk@umext.maine.edu

Hancock
63 Boggy Brook Road,
Ellsworth, ME 04605-9540
Phone: (207) 667-8212
or 1-800-287-1479 (in Maine)
FAX: (207) 667-2003
cehnk@umext.maine.edu

Kennebec
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ceken@umext.maine.edu

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cekl@umext.maine.edu

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ceoxf@umext.maine.edu

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or (800) 287-1485 (in Maine)
FAX: (207) 942-7537
cepen@umext.maine.edu

Piscataquis
Court House Complex,
165 East Main St.,
Dover-Foxcroft, ME 04426
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or 1-800-287-1491 (in Maine)
FAX: (207) 564-3302
cepsq@umext.maine.edu

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FAX: (207) 474-0374
cesom@umext.maine.edu

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FAX: (207) 342-4229
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cewsh@umext.maine.edu

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(207) 581-3188
1-800-287-0274 (in Maine)
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