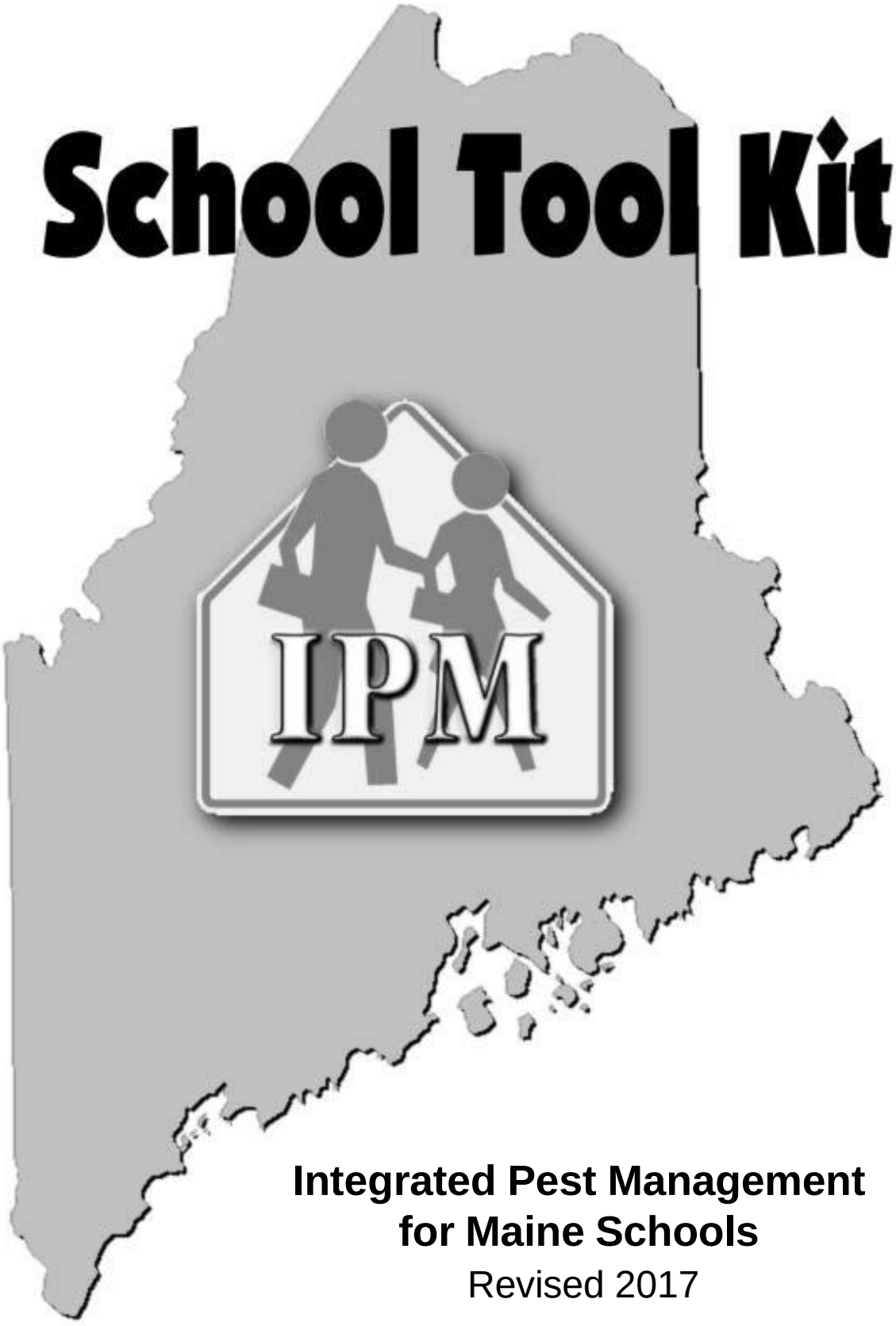
School Tool Kit



Integrated Pest Management for Maine Schools

Revised 2017

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www.maine.gov/schoolipm

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Maine School Integrated Pest Management (IPM) Program

www.maine.gov/schoolipm | 207-287-2731

All Maine public and private schools are required to adopt an integrated pest management (IPM) policy, to appoint an IPM coordinator, and to utilize IPM practices to prevent and manage pests. 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 and pesticides.

Pesticide use is strictly regulated in Maine schools. IPM will help schools manage pests through regular pest monitoring, effective communication, preventive maintenance, and if needed, targeted least-risk pest control tactics.

This tool kit provides checklists, factsheets, sample letters, and resources intended to help schools tailor-fit an IPM program. It is designed to help schools incorporate IPM into existing facilities management, food service, and academic programs. Although the IPM Coordinator is responsible for the day-to-day operation of your schools' IPM program, schools are encouraged to form an IPM advisory committee to guide and sustain a strong IPM program customized to fit each school's specific needs.

The Maine School IPM Program, within the Maine Department of Agriculture, Conservation and Forestry, provides IPM training and support for Maine schools. The Maine School IPM Program is supported with funding from the Maine Board of Pesticides Control and collaborates with University of Maine Cooperative Extension, Maine Department of Education and other organizations to provide science-based information, training and consultation to assist schools in adopting IPM practices in compliance with state regulations.

Think First... Spray Last!

Maine Board of Pesticides Control

maine DEPARTMENT OF Agriculture Conservation & Forestry

THE UNIVERSITY OF MAINE Cooperative Extension

University of Maine Cooperative Extension

Using the Tool Kit

This document was prepared by the Maine Department of Agriculture, Conservation, and Forestry 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 Integrated Pest Management (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 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 customizable letters and forms, can be downloaded at **www.maine.gov/schoolipm.**

How to Use This Tool-Kit

- Review 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 if you are new to IPM
- Go!
  - **Appoint an IPM Coordinator.** (Required in Maine).
  - **Annually Report Name and Contact Information of Your IPM Coordinator**. (Required in Maine). By September 1, using an approved method (see www.maine.gov/schoolipm for reporting procedures).
  - **Adopt and/or Review Your School IPM Policy.** (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.
  - **Create a Pest Management Activity Logbook.** (Required in Maine). Photocopy or print logbook pages found in `Record-Keeping and Monitoring Forms' section of this toolkit
  - **Establish an IPM Committee** or add IPM responsibilities to an existing one. 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.
  - **Inspect** the entire school facility using the **Annual IPM Checklist**
  - **Develop and/or Update Your School IPM Plan** that designates and assigns responsibilities to your school's **IPM team**, including tasks served by any contracted service providers. Include a prioritized list of pest prevention maintenance and monitoring actions needed. Use the **planning and notification templates** to guide you as you develop or revise your IPM plan.
  - **Prepare and Distribute Action Packets** to each IPM team member. This packet is designed to provide guidance to each member of your IPM team. Use this tool kit to assemble customized Action Packets for each of your IPM team members.
    - Adapt or photocopy the **inspection checklists** for each team and place them into their Action Packets. Depending on the size and organization of your schools you may have different packets 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. Additional resources: *Outdoor Integrated Pest Management for Maine Schools* and *Integrated Pest Management for Northeast Schools* (both available in pdf format at www.maine.gov/schoolipm).
    - 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 to measure the effectiveness of the school IPM plan and policy.
  - **Implement Your IPM Plan.** See Appendix for product vendors, regional IPM experts, IPM publications, state and federal resources, and Cooperative Extension offices and contacts.
  - **Regularly Evaluate Your IPM Program**. Do this at least annually and modify as necessary.
  - **Engage Teachers and Students in your School's IPM Program.** See 'Teacher Resources' in Appendix or www.maine.gov/ipm (click on Teacher Resources).

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 to ensure a healthy learning environment. Success requires 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.
- Utilizing combinations of effective and least-risk pest control tactics.
- Applying pesticides only when and where needed, in combination with other effective tactics.
- Selecting materials, methods and timing to minimize exposure risk to people and the environment when pesticides are applied.
- Record-keeping and regular program evaluation and revision.

Examples of IPM Practices:

- Custodians use sanitation methods and tools to prevent pests.
- Grounds managers use practices, such as good turf care, that discourage pest establishment.
- Kitchen staff seal food and clean food preparation and storage areas to limit 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 thoroughly 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, repellents, and any other chemical used to kill a living organism.

Maine law requires anyone applying pesticides in school buildings or on school grounds to have a valid pesticide applicators license. Exceptions are made for disinfectants used for routine cleaning and for non-powered application of certain pesticides for emergency protection from stinging insects. IPM provides an excellent framework for educating the entire school community about preventing and managing pests while eliminating 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. Administrators, staff, students, and the community all play important roles. Contributions by each team member are important 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 must coordinate and communicating IPM activities among different departments and with outside contractors. An advisory committee can be helpful for long-range planning and regular evaluation of the IPM program. In all schools, however, the key to an effective IPM program is designation of a key staff member to coordinate and oversee the day-to-day activities. The IPM Coordinator also ensures that IPM is fully integrated into all aspects of the school's operations. 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 (may be a municipal employee)
- 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 sections 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 is often the first point of contact for health-related pests such as bed bugs, lice, ticks, stinging insects and mosquitoes. The nurse should keep a list of students with asthma or chemical sensitivities. The nurse may also help coordinate notification about the use of chemicals at the school. For medically important pests such as head lice, bed bugs, ticks and mosquitoes, the school nurse should guide development of school policies regarding medically important pests. The nurse should educate parents and staff about prevention, reporting and response protocols for these pests.

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

Contracted 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 without leadership of the IPM Coordinator, support by administration and cooperation from other school staff and contracted service providers.

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 can 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 monitors and reports encounters with pests of health concern. 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 activities, 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 approves any pesticide applications, 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.
- Obtain organizational charts and employee lists. You will need this information to assign responsibilities, distribute checklists, operating procedure protocols, and record-keeping forms, and to provide training.
- Obtain the names and contact information for any outside contractors, such as pest control professionals, vending machine suppliers, trash disposal, building maintenance contractors and lawn or sports-field service providers.
- Set up an electronic or paper record-keeping system. Keep all records, including completed checklists, accessible by you and others on your team.
- Set up an IPM information center where staff members can access information as needed. This is also a great place to post important reminders and communicate with your staff when something comes up. This can be a shareable electronic folder or a physical location such as a bulletin board.

Remember, implementing an IPM program is an on-going process, not a one and done action. Be patient. Stay consistent, be organized, and never forget that you are doing something critically important to protecting health and ensuring academic success of children.

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. Select report forms, checklists, and information pertinent to each Team Member's Action Kit. 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 excluded from their 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 Station 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.maine.gov/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 describe 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 with 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

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

IPM Compliance Checklist for Maine Schools

Requirement	Action	Yes	No
IPM Policy	**Has a written IPM policy been adopted?**		
	Has the IPM policy been implemented?		
Notice	**Is a notice about the school's IPM policy and pesticide use included in the student/parent and staff handbooks?**		
	Does the notice include statements of the following?: • That an IPM policy has been adopted • That pesticides may be used periodically • That the school will provide notification of specific pesticide applications • Where records of pest monitoring and pesticide applications (Pest Management Activity Log) may be viewed • Where the IPM policy, standards of application and state regulations may be reviewed • Information on how to contact the IPM Coordinator		
IPM Coordinator	**Has the school appointed a <u>school employee</u> as the IPM Coordinator?**		
	Does the IPM Coordinator oversee pest monitoring, pesticide applications and all notification activities?		
	Does the Coordinator maintain the following: • A copy of the school(s) IPM policy • A copy of state rule CMR 01-026 Chapter 27 (Standards for Pesticide Applications and Public Notification in Schools) • Current pest management activity log(s) (see below)		
	Has the name and contact information (e-mail address and phone number) of the IPM Coordinator been reported annually by Sept 1 via Maine Department of Education staff reporting system or by contacting the Board of Pesticides Control?		
	Has the Coordinator taken the required training including: 1) Initial training (on-line module), 2) one-time attendance at the Comprehensive IPM Training Workshop and 3) 1 hour of IPM Continuing Education per year? (See www.maine.gov/schoolipm for training module and workshop schedule)		

Pest Management Activity Log	**Does the Pest Management Activity Log have records, for at least the preceding 2 years, of:** • All pest monitoring/sighting records • Specific name of pests and IPM steps taken to control them • Pesticide applications including date, time, location, trade name of product applied, EPA registration number, company name (if applicable) and name and license of the applicator. • If a product has no EPA Registration number, a copy of the label • Documentation showing authorization by the IPM Coordinator for all non-exempt applications		
Employee, Parental and Guardian Notification of Pesticide Application	**Do notices of pesticide applications include the following?** • Trade name and EPA registration number of the pesticide • Approximate date and time of application • Name and phone number for additional information • Location of the application • Reason for the application		
	***During the regular school year are notices of pesticide applications sent to staff and parents/guardians at least 5 days prior to the application? (See NOTE below)**		
Signage	***Are signs posted in a common area and at entry points to application areas at least 2 working days prior to an application? (See NOTE below)**		

* NOTE: except for applications of bait blocks, gels, pastes, granular or pelletized materials placed in areas inaccessible to students, and hand-powered application of general use ready-to-use pesticides for urgent control of stinging or biting insects.

Requirement	Action	Yes	No
	Do signs remain in place at least 48 hours after an application?		
	Are indoor signs • 8.5” wide x 11” tall • Light colored with dark bold letters • Have the word “Caution” in 72 point • Have the words “PESTICIDE APPLICATION NOTICE” in 30 point type or larger		

	♦ Have all the information included in the 'Notice of Pesticide Application' printed with at least 12 point type (see above)		
	Are outdoor signs made of rigid weather resistant materials, at least 5" wide x 4" tall, and include all the above information and the BPC designated symbol?		
Application	**Are applications done according to the IPM policy and by a state licensed Applicator?**		
	Are indoor pesticide applications limited to baits, wall void and crack/crevice treatments and pool/spa disinfectants unless pests threaten the health and safety of occupants as determined by the IPM coordinator?		
	Prior to a pesticide application have 1. Pests and pest conductive conditions been monitored? 2. Pests been identified and determined to exceed acceptable thresholds? 3. Acceptable non-pesticide control measures been taken?		
	Is the ventilation/air conditioning shut off or the building evacuated during indoor applications when space, spot, surface or fumigation treatments are applied?		
	Are people other than essential staff kept outside the room when pesticides other than baits, pastes or gels are applied?		

Administrator Checklist

All Maine schools are required by state regulations to implement an Integrated Pest Management (IPM) program to reduce risks of pests and pesticides on school properties. Administrators play a key role in your schools' IPM program.

- ❑ *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. Annually report IPM Coordinator's name and contact information, including e-mail address to the Maine Board of Pesticides Control through an approved reporting system (see www.maine.gov/schoolipm.)
- ❑ *Develop an official IPM policy. A sample policy statement is provided in the Appendix.
- ❑ Establish an IPM Advisory Committee to provide guidance and input from staff, students, and the community and to regularly review and provide input.
- ❑ Conduct a thorough inspection of school buildings and grounds to assess needs for pest prevention maintenance and sanitation, pest monitoring, and pest management (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 establishing protocols for pest prevention, monitoring, management, record-keeping, and evaluation. Include specific goals, timelines, and responsibilities. Include communication protocols.
- ❑ Distribute IPM Action Packets to appropriate staff.
- ❑ Provide adequate staff training (check www.maine.gov/schoolipm for workshop announcements and training materials).
- ❑ Provide regular IPM and hazardous substances training opportunities for the staff.
- ❑ Verify that staff members who apply pesticides are trained and if required, have a current commercial pesticide applicators license with appropriate certifications.
- ❑ 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.
- ❑ Engage students in the school's IPM program, Students can assist with pest monitoring, reporting, sanitation and non-pesticide pest management activities.
- ❑ Establish written requirements, including bid specifications, for contractors who apply pesticides.

IPM Advisory Committee Checklist

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

- ❑ Review the schools' IPM policy annually. If no policy exists, work with administration to develop it.
- ❑ 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 receives appropriate training.
- ❑ Promote and support opportunities to actively engage students in learning 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 section for a sample IPM policy or obtain one from Maine School Management Association).
- ❑ *Publish a notice describing school's IPM policy and program in the school's policy manual or handbook. The notice must state that pesticides may be periodically applied, where pesticide application 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. (See Planning and Notification Templates section for sample notice)
- ❑ *Authorize, in writing, before each pesticide application (See Pest Management Activity Log in Record Keeping and Monitoring Forms section for sample authorization form)
- ❑ *Notify parents and staff five days before planned pesticide applications (See sample notices in Planning and Notification section).
- ❑ *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 section for sample signs)
- ❑ *Keep an Pest Management Activity Logbook with detailed pest monitoring and pest management records, including all pesticide applications, for two years. Record all IPM actions taken to manage pests and prevent re- infestation. Records must be made available for review by the public and Maine Board of Pesticides Control inspectors. (See Record Keeping and Monitoring Forms section for sample forms)
- ❑ *Ensure that pesticide applications are not made at a time when planned school and community activities will not occur before the re-entry interval stated on the product label has elapsed. Ensure that pesticides are only applied in compliance with the school's IPM policy and state regulations.
- ❑ *Complete all required training including 1) Initial Training Module, 2) Comprehensive IPM Workshop, and 3) one hour per year of IPM Continuing Education.
- ❑ *Ensure that the IPM Coordinator's name and contact information including e-mail address is reported annually to the Maine Board of Pesticides Control via approved reporting system (see www.maine.gov/schoolipm
- ❑ *Coordinate and approve all pest monitoring, prevention, and management activities including the method, material, timing, and site of every pesticide application.

- ❑ 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 for sample IPM plan).
- ❑ Assign responsibilities identified in the IPM plan and the IPM policy (with support from administration and/or IPM advisory committee) to school staff and any contracted service providers.
- ❑ Prepare and distribute IPM Action Packets to appropriate staff and apply the strategies proposed in the IPM plan.
- ❑ 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 with the framework of the IPM plan and IPM policy (see Planning and Notification Templates section for sample IPM contract).
- ❑ Develop a response protocol for common pests such as mice, weeds, ants and yellowjackets.
- ❑ Develop a response protocol for possible human health threat pests such as ticks, mosquitoes, and stinging insects.
- ❑ Develop a response protocol for possible pesticide exposure or spill incident. Train staff on what to do if an incident occurs.
- D Ensure that contractors, staff, and students receive timely and accurate communication about pests, pest management actions and record-keeping.
- ❑ Ensure staff and students receive appropriate training and/or instruction needed to implement IPM.
- ❑ Thoroughly inspect school buildings and grounds at least annually to identify and correct pest-inviting conditions such as broken door-sweeps, missing window screens, or poor condition of turf, shrubs and trees.
- ❑ Evaluate all aspects of the IPM program annually to determine if management objectives are being met. Work with IPM advisory committee to modify as needed.
- ❑ Implement an indoor air quality (IAQ) prevention and monitoring program.

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 a Pest Management Activity logbook at the school and keep a duplicate set of records in the IPM coordinator's office. **Maine schools are required by state regulations to keep all pest monitoring logs, pesticide application records, and pesticide labels and SDSs, 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, beverage dispensers, vending 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 when pest activity is anticipated.

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 pests seeking winter harborage, including rodents, cluster flies, western conifer seed bugs, multicolored Asian lady beetles, and yellowjacket 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 section. 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 Pest Management Activity 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 Pest Management Activity Logbook for two years.
❑	❑	Product labels and SDS for all pesticides applied on/in school grounds or buildings are kept in the school's Pest Management Activity 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 warmer 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 responsibilities 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 floor plan 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 (usually 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, moldings, and floors are sealed.
❑	❑	Openings around electrical conduits, pipe chases, and ducts are sealed or covered with escutcheon plates.
❑	❑	No standing water.
❑	❑	No standing water.
❑	❑	Floor mats are removed for floor cleaning, washed and hung to dry at end of each day. Mats are not put down until floor is dry.
❑	❑	Floor drains covers are in good repair and are lifted and cleaned regularly.
❑	❑	Floor drains are cleaned regularly with a long-handled brush and cleaning solution. No grease build-up, debris or other material blocking drainage.
❑	❑	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 and there is no accumulation of food products or grease on counters, floors or appliances.
❑	❑	Cabinets are clean and well organized. All food sealed in pest-proof containers.
❑	❑	Microwaves, refrigerators, and vending machines are maintained and clean inside and out.
❑	❑	Wiping cloths are disposable or laundered daily.
❑	❑	Mops and mop buckets are properly dried and stored (mops upside-down, buckets emptied).
❑	❑	Overflow water trays in refrigeration units are cleaned and emptied as often as necessary to prevent water leaks.

Kitchen and Cafeteria (cont.)

Yes	No	
❑	❑	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).
❑	❑	Out-of-date charts or paper notices are removed from walls monthly.
❑	❑	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, leak-proof 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.
❑	❑	Free of clutter.

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

Food Storage Areas

Yes	No	
❑	❑	Area is clean, organized and free of clutter.
❑	❑	Shelving units are clean and in good repair. Hollow spaces are sealed (no missing endcaps on shelving units, etc). Made of non-porous, easily cleanable material (eg metal or plastic). Open-design wire shelves that permit inspection and prevent accumulation of food spills preferred.
❑	❑	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 refrigerated or transferred to pest-proof containers within 24 hours.
❑	❑	Packing and shipping materials (cardboard boxes, bags, 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 stored at least 6" off the floor and at least 6" away from walls, allowing access for inspection.
❑	❑	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, dry pasta, rice, plant seeds, pet food and bedding, grain-filled sachets and pillows, rice tables, 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.
❑	❑	All snacks are stored in tightly sealed pest-proof containers.
❑	❑	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.
❑	❑	Areas behind, under and around computers, modems, routers and other heat-generating equipment are regularly inspected for pest evidence, such as gnawing, spots and droppings.
❑	❑	No evidence of pest activity in rooms, under sinks, in closets and cabinets, on windows or sills (no rodent droppings, gnawed food packages, mouse holes, odors, mold, insects, or unhealthy-looking plants).
❑	❑	Furniture such as desks, bookcases, and filing cabinets are thoroughly cleaned on, around, and under at least annually.
❑	❑	New furniture purchases are on wheels or castors to permit them to be easily moved.
❑	❑	Furniture is easily cleanable and easy to inspect for bed bugs or other pests. Upholstered couches and chairs that can readily harbor pests are discouraged or prohibited. Used furniture brought from home, is disallowed, or thoroughly inspected for pests before being allowed 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 to dry, 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.
❑	❑	Bulk good are stored off the floor and at least 6" away from walls.
❑	❑	Custodial closets, work spaces and storage areas are neat and organized.
❑	❑	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 feet (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 well-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.
❑	❑	Pesticides are not applied for pests causing aesthetic damage only.
❑	❑	A notice is published in the policy handbook (for example, student and staff handbooks) describing 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.
❑	❑	Staff and students are instructed in approved pest prevention, management, and pest reporting procedures.
❑	❑	Lower 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 a unique identification code and maps showing the location of each device are included in the Pest Management Activity 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 safety data sheets (SDS) 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 according to label directions.
❑	❑	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 up to dry, 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 around 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 are organized to permit inspection 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 on exterior doors are in good condition.
❑	❑	Exterior doors are well sealed, with no gaps equal or greater than ¼".
❑	❑	Openings around electrical conduit, plumbing, cracks in foundation, and other potential access sites are sealed.
❑	❑	Rain gutters, downspouts, and splash guards 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.
❑	❑	Pest conducive conditions reported by pest control service contractors are addressed in a timely manner.
❑	❑	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.
❑	❑	Dumpsters are kept clean, in good repair. Lids are in good repair and are kept fully closed.
❑	❑	Dumpsters are emptied at least weekly, and more frequently if needed to avoid overfilling.
❑	❑	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	
❑	❑	Returnable beverage containers and recyclable items are washed before placing in recycling bins. If returnables are not rinsed, they are stored in bins with tight fitting lids that are emptied at least weekly.
❑	❑	All returnables and recyclables are taken off site at least weekly.
❑	❑	Recycling and returnable 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 section 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 and beverage waste behind.
❑	❑	Outdoor trash cans (preferably metal) have self-closing lids, are kept clean, and are emptied daily. Cracked or broken cans, or those with evidence of rodent activity, such as gnawed holes, are promptly replaced with a metal one.
❑	❑	Trash receptacles with an open design, such as wire mesh, have openings less than 1/4" in diameter or are retrofit with a sheet metal liner to keep rodents out.
❑	❑	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. At season-end, all food is removed and all equipment and surfaces are thoroughly cleaned to remove all grease and food residues.

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

Water Management

Yes	No	
❑	❑	Water drains away from buildings and does not pool for any period of time on school grounds.
❑	❑	Gutters and drainpipes downspouts and splash guards are regularly cleaned and in good condition.
❑	❑	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).
❑	❑	Trees and shrubs are trimmed to allow at least 12 inches of clearance between foliage and the ground and 12 inches from foliage to building.
❑	❑	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.
❑	❑	Building foundations are kept free of leaves, debris and weeds.
❑	❑	Walls and fence lines 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 section 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 Pest Management Activity Logbook.
❑	❑	Pests are identified before any control actions are taken. Control actions are recorded in the Pest Management Activity Logbook.
❑	❑	Turfgrass 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.
❑	❑	Turfgrass is mowed when the grass is dry and soil is not excessively moist.
❑	❑	Mowing height is set to 2½-3 inches; mowed lower only when and where needed for sports requiring it.
❑	❑	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 1-3 years, depending on level of use, pH is adjusted and fertilizer is added as indicated by test results.
❑	❑	High-use turfgrass is fertilized at least twice each year with slow-release fertilizer. Low maintenance turfgrass is fertilized once a year.

- ❑ ❑ Bare spots and damaged turf are over seeded and top-dressed as necessary
- ❑ ❑ High-use turf is aerated at least once each year, preferably more often if needed to reduce compaction.
- ❑ ❑ High-use turf is overseeded in fall to increase grass thickness and fill in bare spots.
- ❑ ❑ 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 all of us. Together we can help reduce pest problems and pesticide use. Pesticides may only be applied by a licensed professional and only as part of our IPM program. Sanitation, maintenance and good food handling and storage practices are the first line of defense. You can have a positive impact 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.

Pest Monitoring

Yes	No	
❑	❑	Staff are trained to recognize and report signs of pest activity
❑	❑	Any evidence of pests (rodents, insects, droppings, gnawing, webbing, etc.) observed as part of routine work is reported and documented promptly.
❑	❑	Kitchen, food pantry, and cafeteria are inspected for evidence of pests (droppings, webbing, insects, odors, gnawing, etc.) at least monthly. Inspection findings and corrective actions taken are documented and reported promptly to the IPM coordinator.
❑	❑	Insect monitoring traps and glue boards or mouse traps are used to monitor for crawling insects and rodents at least monthly. If a mouse or rat is captured, check traps daily until no more are captured for a week and there is no evidence of continuing activity.

Facilities Inspection and Maintenance

Yes	No	
❑	❑	Kitchen and cafeteria are clean, clutter-free and well-organized.
❑	❑	Unscreened exterior doors and windows are kept closed; never propped open.
❑	❑	Screens on windows and doors are in good repair.
❑	❑	Weather stripping and door sweeps are present and in good condition on exterior doors.
❑	❑	Cracks and crevices in walls, moldings, floors and ceilings are sealed.
❑	❑	Plumbing is kept in good repair. Drips, leaks, sweating pipes, slow drains, etc are reported promptly. 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.
❑	❑	Floor drains are cleaned regularly. Drain covers are kept clean and unblocked. Drain traps are kept full of water.
❑	❑	Sewer lines are in good repair.
❑	❑	Openings around electrical conduits, pipe chases, and ducts are sealed or covered with escutcheon plates.
❑	❑	All equipment is regularly serviced and kept in good repair.
❑	❑	Refrigerators, ovens, stoves, steam tables and microwave ovens are kept clean and in good repair.
❑	❑	Vending machines are maintained in clean condition inside and out.
❑	❑	Food serving line equipment is kept clean and in good repair. All hollow elements are sealed (eg. no missing endcaps; cracks or openings to hollow structural components are sealed).
❑	❑	Paper charts, posters and notices on walls are kept to a minimum, preferably mounted on a bulletin board. Out-of-date charts or paper notices are removed from walls monthly.
❑	❑	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)**

Cleaning

Yes	No	
❑	❑	All food is tightly sealed in pest-proof storage by end of day.
❑	❑	All kitchen areas are cleaned thoroughly before end of each day in use.
❑	❑	Floor mats are lifted off floor before floors are cleaned and not replaced until floor is dry.
❑	❑	Floor mats are cleaned and hung to dry daily.
❑	❑	All used dishes and utensils are cleaned by the end of the day.
❑	❑	All surfaces and equipment are cleaned and dry by the end of the day. Steam tables are emptied and dried daily.
❑	❑	Food preparation and handling equipment such as slicers and mixers are disassembled and cleaned daily.
❑	❑	Wiping cloths, aprons, and other linens are laundered daily.
❑	❑	Mops and mop buckets are properly dried and stored after each use.
❑	❑	Surfaces in food preparation and serving areas are regularly cleaned of any grease deposits.
❑	❑	Portable items such as food carts and tray racks are cleaned frequently and kept free of food debris. Steam cleaning is preferable.
❑	❑	Pits below dumb waiters are checked and cleaned daily.
❑	❑	Cabinets are kept clean and well-organized, free of food debris, spills or crumbs. All food stored in pest-proof containers.
❑	❑	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	
❑	❑	Shipments are inspected upon delivery and rejected if pests are found.
❑	❑	Boxes are unpacked promptly. Cardboard and other shipping material is taken off site promptly.
❑	❑	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.
❑	❑	Any food or food packages found with evidence of pest damage or infestation, such as webbing, insects, droppings, or perforated or gnawed packaging is sealed into a pest-proof container, removed from pantry and reported. Keep a sample of the pest or damage until it is identified, then discard. Follow up to ensure that additional corrective action is taken eliminate the pests.
❑	❑	Food is not left uncovered or exposed overnight.
❑	❑	Food products are stored in pest-proof containers.
❑	❑	Pantry is used only to store food and supplies used regularly by nutrition staff. Other materials and unused or broken equipment are not stored in pantry.
❑	❑	Food and non-food items are stored separately to facilitate inspection and pest prevention.
❑	❑	Torn or broken food packaging is repaired as soon as possible or, if damaged, the food is repacked in new containers.
❑	❑	Spills are cleaned up promptly.
❑	❑	Foodstuffs and dry goods are stored at least 12" off the floor in tightly sealed, pest-proof containers such as plastic storage boxes.
❑	❑	Shelving units made of non-porous, easily cleanable materials such as metal or plastic. Open-design wire shelves that permit inspection and prevent accumulation of food debris is preferred.
❑	❑	Shelving units are clean and in good repair. Hollow spaces are sealed (no missing endcaps, etc).
❑	❑	Shelving units are kept away from walls to allow for inspection
❑	❑	Inspection aisles (at least 6" x 6") are maintained around bulk stored products.
❑	❑	Shelf paper is not used.

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

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 ask school staff to apply pesticides. Pesticides may only be applied by a licensed professional and only as part of our IPM program. Sanitation, maintenance, monitoring and good food handling and storage practices are the first line of defense You can have a positive impact 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 school-approved and trained staff are allowed to use wasp sprays. Use of ant bait stations or mouse poisons is only allowed by licensed pesticide applicators.
❑	❑	District policies concerning storage and use of disinfectants, cleaners, and sanitizers are adhered to by all staff. Staff do not purchase or bring own cleaning or other chemical products from home. Chemicals (including cleaning products) are kept out of reach of children.
❑	❑	Clogged or leaking plumbing, lavatories, sinks, water fountains, heating/ventilation 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.

Yes	No	
❑	❑	Spills on carpets are reported to maintenance and cleaned and dried 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. Damaged screens are reported.
❑	❑	Windows without screens in good repair are kept closed.
❑	❑	Exterior doors that could allow pests to enter are kept closed, not propped open.
❑	❑	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 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.
❑	❑	Potted plants are discouraged. If they are allowed, avoid overwatering. Keep a tray underneath to prevent water leaks. Clean and dry the tray regularly. Inspect plants regularly for pests, mold and odors.
❑	❑	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.

- ❑ ❑ Upholstered furniture is avoided. Used furniture is discouraged. Any used furniture is inspected thoroughly for pests and/or steam-treated before being brought into school.
- ❑ ❑ 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

❑ **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.

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.

Yes	No	
❑	❑	School nurse is a member of the school's environmental, safety, IPM, and indoor air quality teams.
❑	❑	School nurse has access to Safety Data Sheets for all pesticides, disinfectants and sanitizers used on school property.
❑	❑	School nurse can recognize signs and symptoms of pesticide exposure.
❑	❑	The school nurse is knowledgeable about potential impacts of pests and pesticides on human health and is involved in decisions regarding selection and use of pesticides and cleaning products.
❑	❑	School nurse educates school staff, students, and parents on the links between pests, pesticides, indoor air quality, and human health.
❑	❑	School nurse understands and educates staff, students and families appropriate personal hygiene and facility sanitation measures to help prevent or reduce the spread of pests such as bed bugs, head lice, scabies mites, and ringworm.
❑	❑	School nurse is knowledgeable about and communicates with students and staff, appropriate measures to prevent and/or reduce encounters with pests of health concern such as mosquitoes, ticks, and stinging insects (European red ant, stinging caterpillars, hornets, honeybees) on school

Yes	No	
❑	❑	School nurse is involved in decisions, policies and procedures regarding furred and feathered pets in classrooms.
❑	❑	School nurse is knowledgeable about bed bugs and assists school administration to develop protocols for responding to bed bugs introduced into the school on people and belongings.
❑	❑	School nurse is knowledgeable about and communicates with other staff best practices and protocols for preventing the school from being a transfer hub for pests such as fleas, cockroaches and bedbugs.
❑	❑	School nurse provides guidance to families to prevent introduction and spread of bedbugs, fleas, lice, and cockroaches.
❑	❑	School nurse understands and educates students, staff and families that insect and spider bites alone are insufficient to identify a pest; rather, a specimen of the suspected pest must be collected to obtain an accurate identification.
❑	❑	School nurse emphasizes to parents the importance of reading and following the instructions on lice-control products if a parent chooses to use these products.
❑	❑	School nurse can explain the limitations and actual effects of over-the-counter and prescription treatments on head lice at their different life stages.
❑	❑	School nurse maintains school policies and procedures addressing the use of insect repellents on school grounds.

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

Fact Sheets

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 Maine School IPM regulation, *Standards for Pesticide Applications and Public Notifications in Schools*?

- All schools must adopt and implement an integrated pest management (IPM) policy.
- A staff member must be appointed IPM coordinator, the name and contact information must be reported annually to the Maine Board of Pesticides Control, and the IPM Coordinator must complete specific training.
- A notice about the school's IPM policy must be published in the policy manual or handbooks.
- Each pesticide application must be approved by the IPM Coordinator and parents and staff must be notified in advance.

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.

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

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

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.maine.gov/schoolipm/ or by calling 207-287-2731.

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 section 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 section 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!

Maine School Integrated Pest Management Regulation

01 DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY

026 BOARD OF PESTICIDES CONTROL

Chapter 27: STANDARDS FOR PESTICIDE APPLICATIONS AND PUBLIC NOTIFICATION IN SCHOOLS

SUMMARY: This rule establishes procedures and standards for applying pesticides in school buildings and on school grounds. This rule also sets forth the requirements for notifying school staff, students, visitors, parents and guardians about pending pesticide applications.

Section 1. Definitions

A. **Integrated Pest Management**. For the purposes of this rule, 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, and

(5) Systematically evaluating the pest management approaches utilized.

B. **School**. For the purposes of this rule, School means any public, private or tribally funded:

(1) Elementary school,

(2) Secondary school,

(3) Kindergarten or

(4) Nursery school that is part of an elementary or secondary school.

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

D. **School Grounds**. For the purposes of this rule, 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, and

(2) Any other outdoor area used by students or staff including property owned by a municipality or a private entity that is regularly utilized for school activities by

students and staff. School grounds do not include land utilized primarily for non-school activities, such as golf courses and museums.

E. **Integrated Pest Management Coordinator**. An employee of the school system or school who is knowledgeable about integrated pest management and is designated by each school to implement the school pest management policy.

F. **School Session.** For the purposes of this rule, school is considered to be in session during the school year including weekends. School is not considered to be in session during any vacation of at least one week.

Section 2. Requirements for All Schools

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 on school grounds.

B. Each school shall appoint an IPM Coordinator who shall act as the lead person in implementing the school's Integrated Pest Management policy. The IPM Coordinator shall be responsible for coordinating pest monitoring and pesticide applications, and making sure all notice requirements as set forth in this rule are met. In addition, the IPM Coordinator shall:

(1) Complete Board-approved IPM Coordinator overview training within one month of his/her first appointment as an IPM Coordinator and obtain Board documentation thereof;

(2) Complete Board-approved IPM Coordinator comprehensive training within one year of his/her first appointment as an IPM Coordinator and obtain Board documentation thereof;

(3) Obtain at least one hour of Board-approved continuing education annually;

(4) Maintain and make available to parents, guardians and staff upon request:

a. the school’s IPM Policy,

b. a copy of this rule (CMR 01-026 Chapter 27),

c. a “Pest Management Activity Log,” which must be kept current. Pest management information must be kept for a minimum of two years from date of entry, and must include:

i. the specific name of the pest and the IPM steps taken, as described under Section 5C of this rule; and

ii. a list of pesticide applications conducted on school grounds, including the date, time, location, trade name of the product applied, EPA Registration number, company name (if applicable) and the name and license number of the applicator. If the product has no EPA Registration number, then a copy of the label must be included.

(5) Authorize any pesticide application not exempted under Sections 3A(2), 3A(3), 3B, 3C, or 3D made in school buildings or on school grounds and so indicate by

completing and signing an entry on the Pest Management Activity Log prior to, or on the date on which the minimum notification requirements must be implemented; and

(6) Ensure that any applicable notification provisions required under this rule are implemented as specified.

C. By September 1, every school shall inform the Board of the identity and the contact information for the IPM Coordinator. This requirement can be fulfilled through a Board approved reporting system.

Section 3. Exemptions

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

(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 visitor,

(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, and

(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 rule:

(1) Pesticides injected into cracks, crevices or wall voids,

(2) Bait blocks, gels, pastes, granular and pelletized materials placed in areas inaccessible to students,

(3) 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.

C. When the Maine Center for Disease Control has identified arbovirus positive animals (including mosquitoes and ticks) in the area, powered applications for mosquito control are exempt from Section 4B(1) and 5C. Applicators should post the treated area as soon as practical, in a manner consistent with Section 4B(2).

D. School education facilities utilized for agricultural or horticultural education, and not normally used by the general school population, such as, but not limited to, greenhouses, nursery plots or agricultural fields, are exempt from the application limitations contained in Section 5E and notification provisions contained in Section 4B(1) provided that parents, staff and students are informed about the potential for pesticide applications in such areas. The posting requirements contained in Section 4B(2) must be complied with. In addition, students entering treated areas must be trained as agricultural workers, as defined by the federal Worker Protection Standard.

Section 4. Notification

A. A notice shall be included in the school's policy manual or handbook describing the school's IPM program including 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 Section 4B hereof. This notice shall describe how to contact the IPM Coordinator and shall also state that the school's IPM Policy, a copy of the *Standards for Pesticide Applications and Public Notification in Schools* rule (CMR 01-026 Chapter 27), and the Pest Management Activity Log, are available for review.

B. When school is in session, schools shall provide notice of pesticide applications in accordance with Sections 4B(1)and 4B(2). When school is not in session, notice shall be accomplished by posting of signs as described in Section 4B(2) of this rule.

(1) The school shall provide notification of each application not exempted by Section 3 performed inside a school building or on school grounds to all school staff and parents or guardians of students. Notices given shall state, at 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 at least five days prior to the planned application.

(2) 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 rule satisfies the posting requirements of Chapter 28 of the Board's rules (CMR 01-026 Chapter 28).

a. The signs shall:

i. be light colored (white, beige, yellow or pink) with dark, bold letters (black, blue, red or green).

ii. bear the word CAUTION in 72 point type,

iii. bear the words PESTICIDE APPLICATION NOTICE in 30 point type or larger,

iv. state any reentry precautions from the pesticide labeling in at least 12 point type,

v. state the approximate date and time of the application in at least 12 point type, and

vi. state the name of the company or licensed applicator making the pesticide application and a contact telephone number in at least 12 point type,

b. The signs for indoor applications must:

i. be at least 8.5 inches wide by 11 inches tall,

ii. state the trade name and EPA Registration number(s) of the pesticide(s) to be applied in at least 12 point type,

iii. state the location of the application in at least 12 point type, and

iv. state the reason(s) for the application in at least 12 point type.

c. The signs for outdoor applications must:

i. be at least 5 inches wide by 4 inches tall,

ii. be made of rigid, weather-resistant material that will last at least ninety-six (96) hours when placed outdoors,

iii. bear the Board designated symbol (see appendix A), and

iv. state a date and/or time to remove the sign.

Section 5. Integrated Pest Management Techniques

A. All pest management activities shall be undertaken with the recognition that it is the policy of the State to work to find ways to use the minimum amount of pesticides needed to effectively control targeted pests in all areas of application. In all cases, applications should be conducted in a manner to minimize human risk to the maximum extent practicable using currently available technology.

B. 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. Pest management activities should also be conducted in accordance with the Best Management Practices for Athletic Fields & School Grounds, or other applicable Best Management Practices approved by the Board.

C. 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, and

(4) Utilize non-pesticide control measures that have been demonstrated to be practicable, effective and affordable.

D. When a pesticide application is deemed necessary, the applicator must comply with all the requirements of CMR 01-026 Chapter 31–Certification and Licensing Provisions/Commercial Applicator. The applicator must also 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 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.

E. Indoor pesticide use must be limited to placement of baits and wall void or crack and crevice and pool and spa disinfectant 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. Pesticide applications must not be conducted when people are in the same room to be treated except that applicators may set out bait blocks, pastes or gels when only informed staff members are present. When space, spot, surface or fumigation applications are conducted the ventilation and air conditioning 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.

G. Outdoor applications should be scheduled so as to allow the maximum time for sprays to dry and vapors to dissipate and shall not occur when unprotected persons are in the target area or in such proximity as to likely result in unconsenting exposure to pesticides. Applications must also be conducted in accordance with all other applicable Board rules designed for minimizing pesticide drift and posting of treated sites. Spot treatments should be considered in lieu of broadcast applications.

Section 6. Requirements for Commercial Pesticide Applicators Making Applications in School Buildings or on School Grounds

A. Prior to conducting a pesticide application not exempted in Section 3 in a school building or on school grounds, commercial pesticide applicators shall obtain written authorization from the IPM Coordinator. Authorization must be specific to each application and given no more than 10 days prior to the planned application.

B. Commercial pesticide applicators shall, within one business day of each pesticide application, provide the IPM Coordinator with a written record of the application including the date, time, location, trade name of the product applied, EPA Registration number and the name of the licensed applicator. If the product has no EPA Registration number then the applicator will provide a copy of the label.

C. Commercial pesticide applicators shall inform the IPM Coordinator about any pest monitoring activity and results. If it is acceptable to the IPM Coordinator, this may be achieved by recording them in the Pest Management Activity Log.

STATUTORY AUTHORITY: 7 M.R.S.A. §§ 601-625 and 22 M.R.S.A. §§ 1471-A-X

EFFECTIVE DATE:
August 30, 2003, filing 2002-408 accepted October 24, 2002.

AMENDED:
July 5, 2005 – filing 2005-266
March 4, 2007 – Section 3(C), filing 2007-67
August 29, 2013 – filing 2013-188 (Final adoption, major substantive)

Appendix A

Board Designated Symbol for Posting Outdoor Pesticide Applications to School Grounds

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. For all other pesticide usages including but not limited to weed killers (including weed and feed turf care products), rodent and ant toxic baits, algae treatments, insecticides, and fungicides, the applicator must have a commercial pesticide applicator's license, certified in the proper category, and be under the direct, on-site supervision of a Master Applicator. Some schools choose to have a staff member become licensed as a Master Applicator. All other schools may only use non-exempted pesticides by hiring a properly licensed professional applicator. Contact the Maine Board of Pesticides Control (207-287-2731; pesticides@maine.gov) or visit www.thinkfirstspraylast.org to find out how to become licensed or to find a licensed applicator.

A commercial license is required for any one of the following situations:

- Application of **any** restricted/limited use pesticide for purposes other than producing an agricultural commodity
- Use of **any** pesticide as a service for which compensation is received. Examples include lawn and landscape care; water damage restoration; mold remediation; tree and shrub care; and home pest control.
- Use of **any** pesticide on sites **open to public use**. Property is considered open to use by the public when the owner permits routine access by the public, even if a fee is charged for such use. Examples include office and apartment buildings and grounds; golf courses, campgrounds and other outdoor recreation facilities; hospitals and nursing homes; retail and commercial spaces.
- Use of any pesticide in a licensed food or eating establishment.
- Use of **any** pesticide by a government employee as part of their job duties. Government employees include but are not limited to **school**, **town**, county, housing authority, water district, State, Federal and Defense officials.

The commercial applicator/operator certification is the minimum license requirement for individuals employed as technicians under supervision of a licensed master applicator. The operator's license is in effect only if the employing company or organization has at least one licensed master applicator.

The commercial applicator/master certification is required for one individual within each company, organization or agency and at every branch office of that company. This license is generally intended for the owner, supervisor or manager as long as it is the person responsible for major pest control decisions, for establishing policies related to proper pesticide use, and for employee training and overall work practices.

How to Earn a Commercial License Certification

Persons wishing to obtain either level of commercial applicator certification must pass two or more written, closed book examinations with the exception of mold remediation and water damage restoration applicators who must pass only one test. The two minimum tests are the Core Exam which covers general pesticide information and the Category Exams which test knowledge of pest

management practices pertinent to the specific profession where pesticides are used, such as in forestry, lawn care services or structural pest control. The core exam and category exams cost $10.00 each. **(exam fees are waived for school and governmental employees)**

Master-level applicants must also successfully complete a test on pesticide regulations and pass an oral examination conducted by the BPC staff. These exams cost an additional $50.00. **(exam fees are waived for school and governmental employees)**

Tests must be scheduled by submitting a completed application form and the proper fee to the BPC. Exam applications are available by visiting the online Download Library or from the BPC. Exams are generally held weekly at the BPC offices in Augusta **(usually on Wednesdays)** or in Presque Isle by special arrangement **(usually on the last Friday of each month)**. Self-help study materials are available through the UMCE Pest Management Office, 491 College Avenue, Orono, ME 04773; telephone 800-287-0279 or, outside Maine, 207-581-3880, or at UMCE's training manual Web pages.

Staying Certified

A commercial certification is valid for six years; however, the commercial license must be renewed biennially. So that applicators remain current in the latest technologies and regulations while they are certified, the BPC requires holders to attend continuing education courses. The number of credits (1 credit = 1 hour of training) needed for recertification varies according to the license level. Commercial-Master Applicators need 18 credits every 6 years; Commercial-Operator Applicators need 12 credits every 6 years. As with recertification for private license holders, commercial applicators participate in category specific training sessions made available through the BPC, UMCE, industry and trade organizations both in Maine and out of state.

For more information

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

School IPM Fact Sheet

Pest-proofing

A straight forward pest control solution is simply to change the conditions that allowed the offender 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. Pest-proofing 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 pest-proofing yourself, and you may make pest-proofing recommendations to school administrators, maintenance staff, or outside contractors.

Pest-proofing 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 Right 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 in buildings, and proper watering, mowing, and fertilization practices to reduce turf and weed problems on 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 chemical that claims to kill, repel, control or mitigate a living organism is a pesticide. Any product with an EPA Registration number on the label is a pesticide, however, some pesticides do not have an EPA Registration number. Verify that the person doing the application is properly licensed.

2. **Choose least-toxic pesticides.** Carefully read the pesticide product label which can be obtained in advance from the pest control company, found on-line or by contacting the Board of Pesticides Control (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 SDS for other human health risks. Chronic toxicity and environmental impact are also important. Check the label and SDS for mentions of these hazards, especially if wellheads, ponds or streams or pollinators 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 so less product may be needed.

3. **Choose an effective product.** Identify the pest and 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 thuringiensis* (Bt) can control some caterpillars and 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, granules, or ready-to-use formulations present less exposure potential than broadcast applications.

5. **Choose a product with fewer odors 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 for vapors and residues to dissipate or dry 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 SDS 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 who 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 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

University of Maine Extension Pest Management Office: 800-287-0279 or 207-581-3880. <https://extension.umaine.edu/ipm/> . Pest diagnoses, pesticide information, IPM, product recommendations.

Maine Forest Service: 207- 287-243l. <http://www.maine.gov/dacf/mfs/forest_health/>. Tree and forest pest diagnoses and management recommendations (including browntail moth).

Board of Pesticides Control: 207-287-2731 <*http:/www.thinkfirstspraylast.org*>. Labels, SDS, information about pesticide products, regulations and applicator licensing.

National Pesticide Information Center: 800-858-7378. *http://npic.orst.edu/.* Reliable resource for information about pesticides and pest management.

ExToxNet: <*http://extoxnet.orst.edu/*>. A web resource for comparing product toxicities. Compiled by Extension offices nationwide

U.S.EPA: Pesticide-specific information and labels. <*http://www.epa.gov/pesticides*>.

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.

Pests of Buildings and Grounds

School IPM Fact Sheet

Ants

Ants can be a nuisance, but because the most common species do not pose a threat to human health or property, a common sense approach emphasizing good sanitation and maintenance is often effective.

Prevention

- Clean up food and drink spills promptly.
- Keep all food in pest-proof containers. This includes snacks, pet foods, and edible materials used for classroom instruction.
- Empty waste containers at the end of the day so that food is not left in the building overnight. Use liners for waste containers and replace them daily.
- Rinse and store recyclable and returnable cans and bottles in pest-proof containers.
- Trim trees, shrubs and other vegetation at least 12 inches away from buildings.
- Keep grass around buildings mown low.
- Rake back or remove bark mulch from building foundations.
- A 12 to 18 inch-wide crushed stone strip underlain by a weed barrier around the building foundation discourages ants and other pests.
- Repair leaks and condensation problems promptly.
- Seal cracks and crevices in walls, foundation and around windows.
- Keep screens, weather-stripping, and door sweeps in good repair.
- Keep gutters, downspouts, and splash guards debris-free and in good repair.
- Position exterior lighting to avoid attracting insects to building entryways at night. Sodium vapor and yellow bulbs are less attractive to insects.

Management

- If ants have not previously been identified, collect several, and save them in a labeled vial of rubbing alcohol for identification by an expert.
- Determine what the ants are attracted to and remove the food source.
- Remove ants with vacuum, or wipe them up with a sponge dampened with soapy water.
- Wash surfaces where ants are active with soapy water or other school-approved general cleaner to remove ants' invisible odor trails.
- Locate entry points and seal them with caulk or other appropriate sealant material.

Pesticides

- Under Maine law, pesticides including ant 'cups', bait stations, granules, powders and sprays are may only be used in schools by a licensed pest control professional.
- If pesticides are used, bait formulations that foraging ants carry back to their nest are preferred and are usually more effective. Sprays should be avoided.
- Sprays and loose granules should never be used indoors for ant control.
- Pesticides applied to the ground and/or building exterior as a 'perimeter treatment' are generally not recommended.

Some Ants Found in and Around Schools

Pavement ants may forage in buildings throughout the year, feeding on grease, meat, live and dead insects, sweets, roots and seeds of plants. 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. Although they nest primarily outdoors it is common to find them indoors, along with small mounds of soil, along edges of walls where they enter through slab or foundation cracks. Occasionally they will nest in a hollow space inside the building. 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 length-wise parallel grooves.

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. They rarely nest indoors. 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.

Carpenter ants: L-R: queen (winged when young), male, major worker, minor worker.

Carpenter ants may cause considerable damage to wooden structures, particularly moisture-damaged. 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.
- Nests in buildings should be located and removed, and damaged wood should be repaired by a carpenter. Any moisture problems must also be addressed. If nest cannot be located or is inaccessible, strategic application of a pesticide by a licensed pest management professional may be necessary.

European red ants (also called European fire ants) are found in some mostly coastal areas in Maine. 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.

<u>Non-chemical Management:</u>

- These ants can hitchhike on plant and nursery materials, soil, compost, wood chips and logs. Inspect potted plants, tree

balls, soil, compost, wood chips and logs for ants and other insects prior to installing them on school grounds. If ants are found, have them identified by a specialist if European red ants are suspected (they sting! You'll usually know if they are present!). Minimize potential nesting sites on school grounds such as leaves, mulch, stones and logs.

- Ants prefer moist areas, so keep tall grasses and shrubby areas cut to reduce moisture in potential nesting areas.

Pesticides

- Infestations are difficult to manage and nearly impossible to completely eliminate once established, but an application of a bait-formulation type of pesticide by a licensed applicator in early to mid-summer can substantially reduce their numbers.

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".

Resources for Managing Ants

Action Plan for Tramp Ants. http://articles.extension.org/pages/20993/ipm-action-plan-for-tramp-ants

Groden, E., F. Drummond, & L. Stack. 2004. **European Fire Ant: A New Invasive Insect in Maine.** Bulletin #2550. University of Maine Cooperative Extension. https://extension.umaine.edu/publications/2550e/

University of Maine Fire Ant website: http://fireants.umaine-biology.org/management/

University of Maine Cooperative Extension Pest Management Office: Telephone: 207-581-3880; https://extension.umaine.edu/ipm/.

Maine IPM Council: www.gotpests.org

Action Plan for Carpenter Ants: http://articles.extension.org/pages/61824/ipm-action-plan-for-carpenter-ants

School IPM Fact Sheet

Bats

Bat encounters in or around schools can occur in spring and summer, when a stray bat enters a building or a colony may be roosting in the building. Although they are beneficial—helping to keep insects such as mosquitoes in check—bats can be infected with rabies virus, thus presenting a potential and serious health risk to people. If you think that you or another person has been in contact with a bat, call Maine Center for Disease Control and Prevention (CDC) immediately at 800- 821-5821.

Bats that come into contact with a person or domestic pet must be tested for rabies. If possible, capture and containerize the bat and contact Maine CDC for guidance. Always wear leather gloves while capturing and containing the bat. If there has been no human or pet contact with the bat, it can be released or allowed to exit the building. If possible, isolate it in a room, open a window or door and allow the bat to find its way out. If the bat is stationary, place a can or small box over it, slip a piece of cardboard underneath and take it outdoors. For assistance with stray bats see Resources below.

Prevention: Inspect building for possible entryways. Seal all gaps around doors, windows, eaves and roof. Some common bat entrance points include chimneys; joints between window frames and siding; joints around large exterior beams; building corners; where pipes or wires penetrate the ceiling or walls in attics; between porches or other additions; at roof edges, ridge caps, soffits, and fascia boards; where walls meet eaves at the gable ends of an attic; in gaps under shingles. Mount exterior lights on posts rather than on the building or turn them off at night to avoid attracting insects, which attract bats. Sodium vapor lights and yellow bulbs attract fewer insects.

If a Bat Colony Roosts in a School Building: Bats can roost in natural areas such as caves and hollow trees, or in built structures such as bridges and buildings. Bats roost during the day. At dusk, they fly out of their roosting site to feed. Bats migrate to winter hibernation sites by mid-October, but a colony can return to its summer roosting site year after year. If bats roost in school buildings, identify and mark their entrance sites while they are present. Seal the marked entryways after the colony has migrated away for winter and before bats return by mid-March. To find their entrance/exit sites, stand away from the building at dusk and watch to see where they come out. If possible, enter the attic during daylight hours to look for light shining through cracks and holes. To evict bats before winter, a one-way bat excluder can be installed after mid-August when young can fly. For guidance contact a wildlife control professional or Maine Inland Fisheries and Wildlife (see contact information below).

For Rabies and Medical Guidance

- Maine Center for Disease Control and Prevention: 800-821-5821

Resources for Help with Bat Removal

- Local animal control officer (contact your town office for contact information)
- Local game warden (listed at www.maine.gov/ifw/aboutus/contactus.htm)
- ME Department of Inland Fisheries and Wildlife, 207-287-8000, www.maine.gov/ifw/wildlife/human/lww_information/bats.html
- USDA Wildlife Services, 207-629-5181
- Licensed wildlife control professional (search for ‘bat’ at www.gotpests.org for list of companies)

School IPM Fact Sheet

Bed Bugs

Many areas of the country are experiencing a significant increase in bed bug infestations in residences, hotels, college campuses and schools. Many people associate bed bugs with unsanitary conditions, as often is the case with pests like cockroaches. However, bed bug infestations occur across the spectrum of social and economic settings and are not necessarily an indication of unsanitary conditions. Experts have speculated that the increase is more likely due to a number of factors such as to be more related to increased travel, changes in tactics used for controlling pests such as cockroaches, and an increasing resistance by bed bugs to the most commonly used insecticides.

Bed Bug (Cimex lectularius)

Identification and Biology

Bed bugs adults are reddish-brown, oval, flattened insects about 3 /16" long and up 1 /8" wide that feed on the blood of people while they sleep. Blood-fed adults are swollen and dull red. Though wingless, adult bed bugs do have small wing pads. The dark colored eyes stand out and the sides of the collar-like pronotum curve slightly around the head and is covered with long hairs. The nymphs (immatures) resemble the adult but are smaller in size. Newly hatched nymphs are almost colorless whereas engorged nymphs are reddish and swollen. Bed bug eggs are white, oval, and about1 mm long.

Although the bite does not hurt at the time, it may develop into an itchy welt similar to a mosquito bite. Bed bugs do not transmit disease, but they can cause significant itchiness, anxiety, and sleeplessness. Bed bug infestations are also very difficult and expensive to control. Usually, bed bugs will hide during the day and only come out to feed during the night. Unlike head lice, they do not live on a person. However, they can hitchhike from one place to another in backpacks, clothing, luggage, books and other items.

Bed bugs do not bore into the skin; instead, they pierce their mouthparts into the host's skin and suck out blood. As bed bugs feed, they inject saliva which can trigger an allergic reaction that may appear as swelling, itching, and irritation. Some people may not react and exhibit the bite marks, while others may have a 1-2 day delay before bite marks appear. The marks may take a week or more to fade. Large infestations of bed bugs may have a noticeable "sweet" odor.

Life Cycle and Habits

When conditions are favorable, bed bugs can feed and breed all year. They typically hide during the day on (or in) mattresses/box springs or in cracks and crevices no thicker than an ordinary credit card. Each female can lay 200 to 500 eggs. When the insects feed regularly, eggs are laid in batches of 10 to 50 at 3 to 15-day intervals. Bed bugs lay more eggs when the temperature is above 70°F and usually stop when temperatures drop below 50°F. A sticky substance covers the egg when it is first laid. After it dries, it allows the egg to stick to its host surface. Eggs hatch in about 10 days in warmer temperatures and at lower temperatures may take as long as 28 days. Newly hatched bugs feed at the first opportunity. They molt five times before reaching maturity and must eat at least one blood meal between each molt. Immature stages can survive more than two months without feeding; however, most nymphs usually develop into adults within 2 to 6 weeks. One may find all stages of bed bugs in well-established infestations. Bed bug adults can survive up to a year or more without feeding, which means that infestations may continue to survive even if a house was left vacant for several months.

Bed bugs cannot fly or jump but they can crawl. They spread primarily through human activity- people may unintentionally move them from one place to another in luggage, laundry, etc. Piles of nymphs' shed skins often accumulate in and around bed bug hiding places.

How to Have an Insect Identified

If a suspicious bug is found in school, it should be collected for identification. To collect the specimen, use a piece of tape, tissue or tweezers, and place the specimen in small leak-proof vial, such as a pill bottle or film canister containing a small amount of rubbing alcohol. Do not crush the specimen. Do not mail or transport live specimens as they may escape during transit. Have the specimen identified by your contracted pest management service or by the University of Maine Pest Management Office (*https://extension.umaine.edu/ipm/*. 800-287-0279).

Introduction versus Infestation

Actual bed bug infestations in schools are uncommon. More commonly, a few bed bugs will hitchhike to school from an infested home by hiding in a student's clothing or backpack. Bed bugs introduced into the school in one student's backpack could be carried home by another student, making the school a potential hub for bed bug spread. This is not a minor concern – bed bugs are very expensive and difficult to eradicate.

Eliminating Bed Bugs

When a bed bug is found, it can be difficult to determine the source. A bed bug found on a student or student's belongings may have come from another student or a staff member rather than from the student's home. Similar to head lice, it is very important to address the issue with care and sensitivity. There is no association between cleanliness, socioeconomic status and bed bug infestations. Anyone can experience an infestation.

Bed bug bites

Evidence of blood spots

Bed Bug Eggs

Photo Credits: Whitney Cranshaw, Colorado State University, Bugwood.org Gary Alpert, Bugwood.org

Additional Resources

- Maine Center for Disease Control and Prevention: www.mainepublichealth.gov/bedbugs
- Maine Department of Agriculture School IPM Program: www.maine.gov/schoolipm
- Maine Landlord/Tenant Regulations: http://www.mainelegislature.org/legis/statutes/14/title14sec6021-A.html
- University of Maine Cooperative Extension: https://extension.umaine.edu/ipm/

The following is from 'Bed Bugs and Schools' Maine Center for Disease Control and Prevention and Maine Department of Education guidance document.

What are bed bugs? Bed bugs are small, brownish, flattened insects that feed on the blood of people while they sleep. Although the bite does not hurt at the time, it may develop into an itchy welt similar to a mosquito bite. Bed bugs do not transmit disease, but they can cause significant itchiness, anxiety, and sleeplessness. Bed bug infestations are also very difficult and expensive to control. Usually, bed bugs will hide during the day and only come out to feed during the night. Unlike head lice, they do not live on a person. However, they can hitchhike from one place to another in backpacks, clothing, luggage, books and other items.

Could my classroom be infested? Actual bed bug infestations in schools are uncommon. More commonly, a few bed bugs will hitchhike to school from an infested home by hiding in a student's clothing or backpack. Bed bugs that hitch a ride into the school in one student's backpack could be carried home by another student, making the school a potential hub for bed bug spread. This is not a minor concern – bed bugs are very expensive and difficult to eradicate. All Maine schools are required under Maine law to have an integrated pest management (IPM) policy in place. If a bed bug infestation is suspected or a number of students are bitten during class, the school should contact the district IPM Coordinator who can contact a licensed pest control professional for assistance.

What if I find a bed bug on a student? Have the specimen identified by your contracted licensed pest control professional or the University of Maine Cooperative Extension Pest Management Office (1-800-287-0279). If a bed bug is found on a student, it may indicate that the student has bed bugs at home. However, bed bugs can crawl onto or off of a person (or their belongings) at any time, so it is also possible that the bed bug was brought to school by someone else. If a suspected bed bug is found on a student or a student's belongings, the following procedures should be followed:

- The student should be discreetly removed from the classroom so that the school nurse or a qualified individual can examine the student's clothing and other belongings. Any bugs found should be removed and collected for identification. Try to keep the specimens as intact as possible.
- If a confirmed bed bug was found on a student, then the school principal or nurse should contact the student's parents or guardian to inform them of the bed bug presence on their child. Consider sending a bed bug inspection form home, a sample is provided at the end of this fact sheet. Educational materials, such as those available at http://www.mainepublichealth.gov/bedbugs should also be provided to the family.
- The school principal or nurse or center program director should consider notifying the affected class or classes. A sample notification letter is provided at the end of this document.
- Students should not be excluded from school due to bed bugs unless repeated efforts have been made to remedy an infestation. Schools should not be closed due to bed bug presence; if pest management is necessary it will normally be targeted to certain areas of the schools.
- Ongoing pest management that includes the use of pesticides should be overseen by the school IPM Coordinator, and must conform to the schools' integrated pest management policy and the Maine Board of Pesticides Control's Chapter 27 rule.

What can I do to eliminate bed bugs from my classroom?

- DO NOT allow untrained staff to apply pesticides on school property. By law, only licensed

applicators can apply pesticides (even ready-to-use products like sprays) in schools, and in compliance with the school's IPM policy.

- Backpacks, lunchboxes, and other items that travel back and forth to school can also be inspected daily and sealed in plastic containers to prevent bed bugs from getting into them at home.
- Vacuum all cracks and crevices and dispose of the vacuum bag.
- Hard surfaces can be cleaned with standard cleaning products.
- If bed bugs have been found repeatedly in a particular classroom, have the room inspected by a licensed pest control professional or other trained staff.

What if one of my students has an infestation at home?

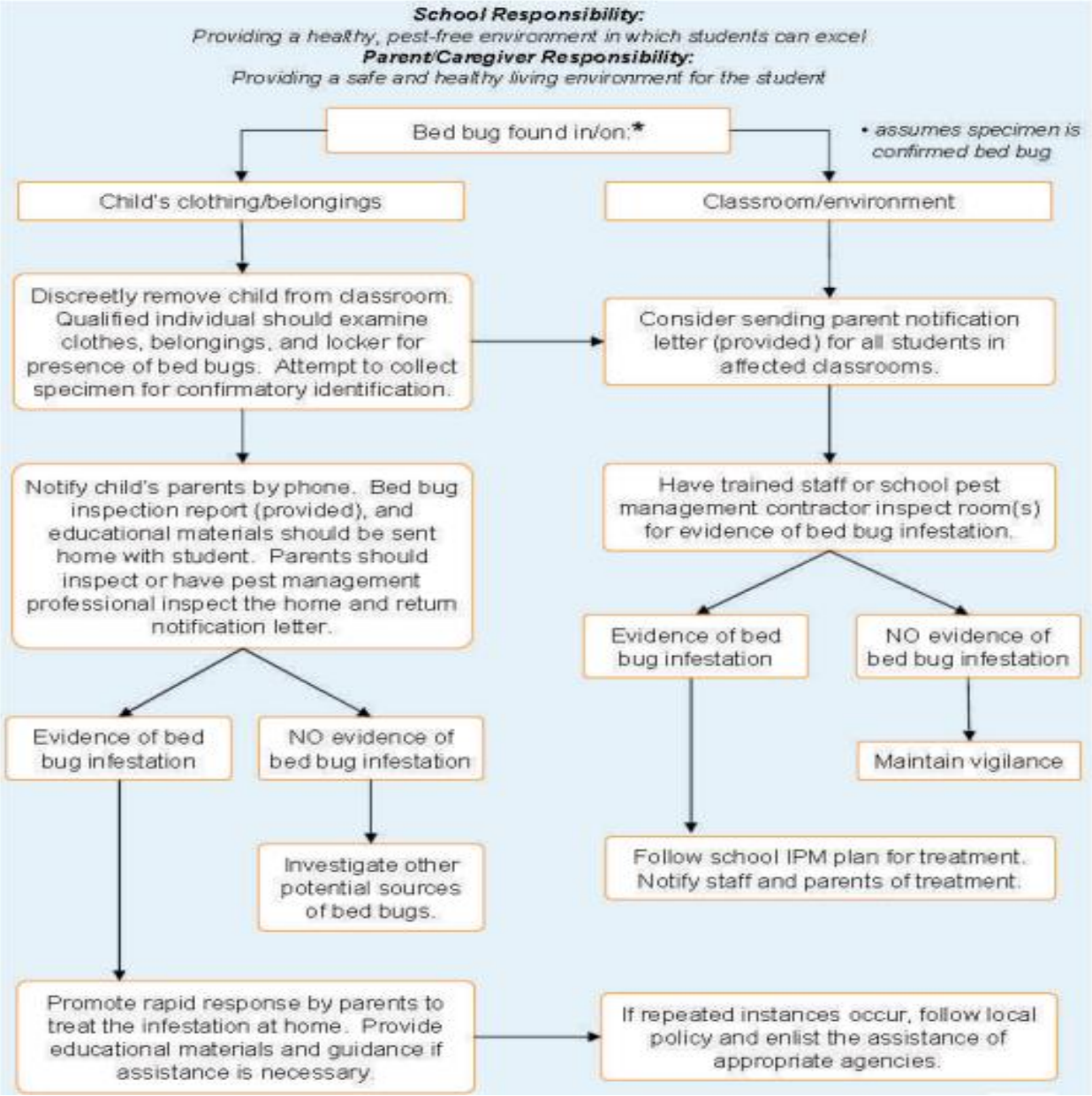
When a student is dealing with an infestation at home, it is important to be sensitive to their problem. Although bed bugs have nothing to do with cleanliness or socioeconomic status, there is still a stigma that can come with having bed bugs. As a result, parents may be hesitant to admit to having bed bugs, and students may not want others to know they have an infestation at home. Students living in an infested home may also feel anxious or tired during the school day. Schools should work with the parents of any student living in an infested home to develop strategies for preventing the further spread of bed bugs.

- Determine if the infested home is being treated. Home remedies and do-it-yourself treatments are usually insufficient and could cause negative health effects or produce potential hazards in the home.
- In an infested home, parents should store their child's freshly laundered clothing in sealed plastic bags until they are put on in the morning. This prevents bed bugs from hiding in the clothing and being carried to school.
- Backpacks, lunchboxes, and other items that travel back and forth to school can also be inspected daily and stored in sealed plastic containers at home to prevent bed bugs from getting into them.
- At school, the students could be provided with plastic bags or bins in which to store their belongings in order to prevent any bed bugs from spreading to other students' belongings.
- If bed bugs are finding their way into the school, consider notifying the affected classes. A sample notification letter is provided at the end of this fact sheet.
- Continue to use these measures until successful treatment of the home has been verified.

School IPM Policy and State Law

Bed bug management must be done according to the school's Integrated Pest Management (IPM) policy. Although bed bugs elicit a lot of emotions, schools should not overreact to an encounter. Each school must have an IPM policy in place and should follow it carefully when deciding how to control a confirmed bed bug problem. The school's IPM Coordinator must approve any pesticide applications and make sure the regulations in **CMR 01-026, Chapter 27, Standards for Pesticide Applications and Public Notification in Schools**, are followed. Any pesticide application must be performed by licensed pesticide applicators.

Flow Chart for School Response



Flowchart courtesy of Michigan Bed Bug Working Group's "Bed Bugs: What Schools Need To Know" document

Sample

Bed Bugs Found in a Classroom Parent Notification Letter (on school letterhead)

Dear Parent or Guardian,

We recently found a bed bug in your child's classroom. Bed bugs are a nuisance and can cause considerable discomfort, but their bites are not known to spread disease. Bed bugs are usually active at night and feed on human blood. The bite does not hurt at first, but it may become swollen and itch, much like a mosquito bite. Watch for clusters of bites on exposed areas of the body. If you have medical concerns for you or your child, please contact your doctor. The source of bed bugs often cannot be determined, as bed bugs may be found in many places including hotels, planes, and movie theaters. Even though it is unlikely for bed bugs to infest a school, *(Fill in School Name here)* will conduct an inspection and, if needed, will implement our integrated pest management plan in the area where the bed bug was found. *(Fill in School Name here)* will continue to work to identify bed bugs, provide thorough inspections of schools and have licensed pest control specialists assist with pest management if necessary. If you have any questions regarding bed bugs in your school, please contact (*add contact name here)*. If you have any questions regarding bed bugs found in your home, contact your local health officer or visit http://mainepublichealth.gov/bedbugs.

Sincerely,

_____ _____

School Nurse Principal

Sample

Bed Bug Inspection Form

Dear Parent,

Today, a bed bug was found on your child or in your child's belongings. While this does not necessarily mean that the bed bug was brought to school by your child, it is important to your child's health and to the school community that you inspect your home for signs of bed bugs. Enclosed you will find information about bed bugs. It is recommended that you or a licensed pest management professional inspect your home for bed bugs. Once you have inspected your home, please fill out the form below and return to the school office by _____ (*date*).

Sincerely,

_____
Name

I have been informed that a bed bug was found on my child at school. I have read and understood the educational materials provided to me regarding bed bugs, and have:

- ☐ Carefully checked my family and home for signs of bed bug infestation myself or
- ☐ Hired a pest management professional to check my family and home for signs of bed bug infestation. Name of pest control company: _____

After completing a careful inspection,

- ☐ I certify that to the best of my knowledge: I or a pest management professional found signs of bed bugs in my home, and I will take the following actions to eliminate this infestation:

- ☐ I or a pest management professional did not find signs of bed bugs in my home at this time. If I find evidence of bed bugs in the future, I will notify the school immediately and take action to address the infestation.

I understand that bed bugs can be spread to other homes if they are brought to school in backpacks, clothing, and other belongings. I understand that if bed bugs are repeatedly found on my child, that the school may take additional actions to protect the school community from bed bugs.

Signature_____ Date_____

Pest management professional's signature_____Date_____

School IPM Fact Sheet

Browntail Moth

Source: *Maine Forest Service Factsheet*

The browntail moth was accidently introduced into Somerville, Massachusetts from Europe in 1897. By 1913, the insect had spread to all of the New England states, New Brunswick and Nova Scotia but later receded until there was just a residual population limited to Cape Cod and a few islands off the Maine coast in Casco Bay. Occasional outbreaks occurred on the mainland during twentieth century until the 1990's when browntail became a perennial problem along the southern Maine coast.

Browntail Moth larvae

Browntail Moth adults

Nest structure

Photo Credits: Milan Zubrik, Bugwood.org; Gyorgy Csoka, Bugwood.org

Damage

The larval stage (caterpillar) of this insect feeds on the foliage of hardwood trees and shrubs including: oak, shadbush, apple, cherry, beach plum, and rugosa rose. Larval feeding causes reduction of growth and occasional mortality of valued trees and shrubs. While feeding damage may cause some concern, the primary human impact from the browntail moth is the result of contact with poisonous hairs found on the caterpillars. Contact of these hairs with human skin causes a rash similar to poison ivy that can be severe on some individuals.

Life History

The browntail moth produces one generation a year. It has four life stages; egg, larval, pupal, and adult. The larval stage lasts for nine months, from August through June. In the fall, colonies of larvae build nests in trees constructed from a single leaf wrapped tightly with large amounts of white silk. A colony consists of 25 to 400 or more larvae. The larvae overwinter within webbed nests that are two to four inches long and are situated on branch tips. Fall webworm nests, often confused with the browntail moth winter webs, are loose, further in on the branches and more often found in ash trees then oak or apple. Eastern tent caterpillar tents are found in crotches and forks of apple and cherry tree branches during the spring.

In the spring, as soon as the earliest leaf buds open, the larvae become active and crawl out of their nests to feed on the tender foliage. They may devour the foliage as fast as it develops. For a time the larvae crawl back into the web at night, but as they become larger they remain out on the leaves. By late June, larvae are full grown. Large larvae, about 1 1/2 inches long, are dark brown and have a broken white stripe on each side of the body and conspicuous, unpaired, reddish spots on the posterior end of the back. These should not be confused with larvae of the eastern tent caterpillar which has a single, solid, white stripe down its back or the gypsy moth which has paired blue and red spots on its back.

In late June, the larvae spin rough cocoons in which to pupate. Pupal cocoons are full of toxic hairs and should be removed from buildings or trees only with great caution. The pupae develop into moths which emerge from the cocoons in July. The moths have a wingspread of about 1 1/2 inches. Wings and midsection are pure white. The abdomen (rear part of the body) is brown with a conspicuous tuft of brown hairs at the tip.

After emerging, the females lay eggs in masses on the underside of leaves and cover the eggs with brown hairs from their bodies. Each female lays 200 to 400 eggs. The eggs hatch during August or early in September and the young larvae feed for a short time on the leaves before building their winter webs. This fall feeding does little damage to the trees.

Precautions

The browntail moth caterpillar has tiny (0.15 mm) poisonous hairs (setae) that cause dermatitis (skin rash) similar to poison ivy on sensitive individuals. People may develop dermatitis from direct contact with the caterpillar or indirectly from contact with airborne hairs. The hairs become airborne from either being dislodged from the living or dead caterpillar or they come from cast skins when the caterpillar molts. Most people affected by the hairs develop a localized rash that will last for a few hours up to several days but on some sensitive individuals the rash can be severe and last for several weeks. The rash results from both a chemical reaction to a toxin in the setae and a physical irritation as the barbed setae become embedded in the skin. Respiratory distress from inhaling the hairs has been reported (11% of the population in one health survey) and can be serious.

The following precautions may help people living or visiting browntail moth infested areas during June-August:

- Avoid places heavily infested by caterpillars. Campers should plan their stays on un-infested islands. Take a cool shower and change clothes after any activity that might involve contact with browntail moth hairs.
- Dry laundry inside during June and July to avoid having the hairs become impregnated in clothing. Wear respirator, goggles and coveralls tightly closed at neck, wrists and ankles when performing activities that stir up caterpillar hairs such as mowing, raking, weed whacking, or removing pupal webbing from eaves and boats.
- Perform the above tasks above on damp days or wet down material with a hose as moisture helps keep the hairs from becoming airborne, thereby minimizing contact.
- Use caution cleaning debris left by caterpillars because the toxin is extremely stable and remains a hazard for a number of years. Summer residents should bear this in mind when opening cottages that have been closed all winter as the hairs frequently settle over the winter and may be contacted when spring cleaning. Wet mopping prior to vacuuming or dusting is advised.
- Consult your physician if you develop a severe reaction to the browntail moth.
- Be aware that the chances of contacting browntail hairs increases during dry windy conditions.

Control

Non-chemical: Control of browntail moth populations in isolated areas may be obtained by clipping the overwintering webs and destroying these webs by soaking in water or burning them. This control should be undertaken in the winter and very early spring - September to mid-April.

Chemical: Undertake control measures as early as possible to reduce the exposure to the irritating caterpillar hairs. Pesticides should be applied when caterpillars are present and feeding, from early May through the end of June. There are special regulations regarding control of browntail larvae within 250 feet of marine waters. Only registered fruit tree formulations should be used on apple and other fruit trees.

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

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-absorbent, 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

German

Brown-banded

Cockroach Egg Case

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 (especially 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 Pest Management Activity 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 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".

Additional Resources

Integrated Pest Management for Northeast Schools.2002. Hollingsworth et al (eds.). Natural Resource, Agriculture, and Engineering Service. NRAES-33. p.28-33. Available in pdf at: http://www.maine.gov/dacf/php/integrated_pest_management/school/tools/documents/Hollingsworthfor_viewing_only_ipmns.pdf

Cockroaches and Schools. US EPA. https://www.epa.gov/managing-pests-schools/cockroaches-and-schools

Action Plan for German Cockroaches. eXtension. http://articles.extension.org/pages/22045/ipm-action-plan-for-german-cockroaches

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

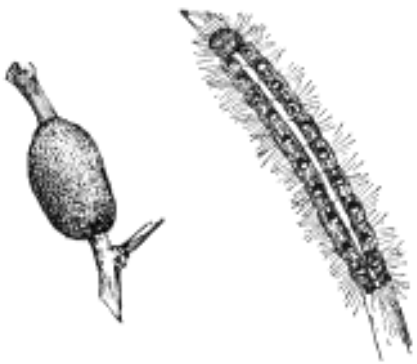
Tent caterpillars spend the winter as dark, collar shaped egg masses about 1 inch long on branches and twigs. Each egg mass contains 150-300 eggs. Eggs hatch in spring, when tree buds begin to open. Young caterpillars construct tent-like silken masses near the trunk in branch crotches. They feed for 6-8 weeks before transforming 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

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 light 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 odors 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 moth like 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 maggots 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

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.

Additional Resources

Maine Department of Education School Health Manual.
http://maine.gov/education/sh/contents/index.html.

IPM Action Plan for Head Lice. eXtension. http://articles.extension.org/pages/20989/ipm-action-plan-for-head-lice

Parasites. US Centers for Disease Control and Prevention:
http://www.cdc.gov/parasites/

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 final wipedown with an approved disinfectant may be advisable. Always wear gloves and eye protection and provide proper ventilation when using chemical cleansers and disinfectants. 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.

Additional Resources

A School's Guide to Dealing with Mold using Integrated Pest Management Wisconsin Department of Agriculture, Trade, and Consumer Protection.
http://ischoolpestmanager.org/docs/227.0.pdf

Mold Remediation in Schools and Commercial Buildings Guide.
https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide

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, 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.

Repellents

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

Repellents 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, or IR3535. Pure oil of lemon eucalyptus (e.g. essential oil) is not registered and, therefore, not recommended. Repellents containing 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 repellents 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. How- ever, if there is extensive mosquito breeding areas on school property, considers 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".

Additional Resources

Insect Repellents: USEPA https://www.epa.gov/insect-repellents

IPM Action Plan for Mosquitoes: eXtension.
http://articles.extension.org/pages/20999/ipm-action-plan-for-mosquitoes

Maine Centers for Disease Control and Prevention.
http://www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/index.shtml

School IPM Fact Sheet

Ornamental Pest Prevention

Written by Dr. Lois Berg Stack, University of Maine Extension

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 installation 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 variety 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 over fertilize. 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 on-line resources. Turfgrass programs at universities are often a good source of up-to-date recommendations and information. Cornell University, University of Massachusetts, University of Michigan, and Pennylvania State University have active turfgrass IPM programs.
    - List of Maine native plants for landscape use: <http://www.umext.maine.edu/onlinepubs/htmpubs/2500.htm>.
    - Maine Yardscaping: <http://www.yardscaping.org/http://www.yardscaping.org/>.

School IPM Fact Sheet

Pantry Pests

From: Ogg, Clyde L. and Erin C. Bauer, 2012. Integrated Pest Management in Sensitive Environments, a How-to Guide. University of Nebraska–Lincoln Extension.

Various pantry pests may infest stored foods. They commonly infest flour, cereals, cracked grains, baking mixes and processed foods, crackers, macaroni, cured meats, powdered milk, dried fruits, nuts, popcorn and spices, making them a serious problem for schools to prevent. Insects that feed on these products may also infest other grain-based items such as pet foods, birdseed and ornamental corn. Dried flower arrangements may also be attacked.

Indian Meal Moth
(Plodia interpunctella)

Identification and Biology

Indian Meal Moth (*Plodia interpunctella*) is the top-most common food-infesting moth found in schools, homes, grocery stores and any place where dried pet foods are produced or stored. It feeds on a large variety of stored food products, but infestations often are started through dried pet food or birdseed. Nuts are a favorite breeding source; infestations have been found in nut caches of squirrels in attics and chimneys.

The larva prefers coarse grades of flour, whole grains, cereal, dried fruits, seeds and spices. Foods infested with these insects will have the larva's silk webbing present; look to find it at or near the food surface. Adult moths are about ½-inch long and have distinctive wing markings. The base of the forewing is pale grey and the outer two thirds is reddish-brown with a coppery luster. They have a unique way of folding their wings while 'resting' at an angle against a wall. The larvae are generally creamy-white with shades of yellow, pink, brown or green. Mature larvae, which are about ½-inch long, usually move away from the feeding site and spin a silk cocoon in which to pupate.

Indian meal moth larva
(Plodia interpunctella)

Indian meal moth adult

Dermestid Beetles are common pests that scavenge and feed on animal matter like dried meats, dead insects, hides and woolens. The species that feed on wool and other natural fibers or blends are sometimes called carpet beetles. Closely related species, such as the warehouse beetle, varied carpet beetle and larder beetle have adapted for other foods and now also feed on grain and grain-based products. They are especially common in flour and cereals but also are found in candy, cocoa, cookies, corn meal, nuts, pasta, dried spices, and many other dry foods.

Black carpet beetle

Carpet beetle larva

Larder beetle

Usually only larvae can be found in infested food. After pupating, the adults will leave the food to feed on pollen. Sometimes only the larval "skins' will be found. Dead adults are often found in windowsills because they fly to the light, trying to get outside.

Because some of these species feed on woolens and cloth, infestations in the pantry may spread and damage valuable clothing and furs. Proper cleaning and storage of woolen and cloth products will help prevent damage.

Sawtoothed Grain Beetle (*Oryzaephilus surinamensisis*) is another very common pantry pest. It does not feed on intact whole grains but feeds on many processed food products. This may include breakfast food, dried fruits, nuts, sugar, chocolate, and macaroni. It especially likes to eat oatmeal and birdseed. Their flattened body gives them the ability to get into sealed boxes.

Adults are nearly ¼-inch long, slender, with brownish red coloring. They are normally very active. Their name comes from the six sawlike teeth on either side of the thorax behind the head. After finding some potential food, the female will lay white, shiny eggs that hatch into cream colored larvae. There can be as many as seven generations in a given year, but sawtoothed grain beetles often stop breeding in the winter unless buildings are heated and moisture is sufficient. Adults are very long lived and remain active in the winter.

Sawtoothed Grain Beetle

Cigarette Beetles (*Lasioderma serricorne*) **and Drugstore Beetles** (*Stegobium paniceumare*) small, stout beetles are common in kitchens where they will eat cereals, spices, and other packaged foods. Since they closely resemble each other, they are often confused. The heads of both beetles are tucked under the prothorax and are not visible from above. Both are brown and about the same size.

The two beetles can be distinguished by their wing covers. The wing covers of the drugstore beetle have rows of longitudinal grooves while those of the cigarette beetle are smooth. Another distinguishing feature is the antenna. The drugstore beetle has a three-segmented club while the cigarette beetle has an antenna that looks a little like a saw blade. Both the cigarette and drugstore beetles belong to the family Anobiidae and can be confused with some wood-boring beetles of the same family. It is important to have the beetle identified because wood-boring beetles have greater damage potential than the cigarette and drugstore beetle. However, if the beetles are found in food or grain products, it is most likely a cigarette or drugstore beetle.

Drugstore Beetle

Cigarette Beetle and Larva

Other Pantry Pests

Flour Beetles (*Tribolium spp*) contain many species of tiny beetles that infest flour, but the two most common flour beetles are the confused and red flour beetles. These beetles are scavengers because they must wait for other insects to damage grain kernels before they can attack. In schools, they can be found feeding on flour, cracked grains, cake mixes, beans, peas, dried fruits, nuts, chocolate, and spices.

They can be distinguished from one another by inspecting the antennae. On the red flour beetle, the antennae has three-segmented club on the end. The antenna of the confused flour beetle gradually enlarges toward the tip, ending in a four-segmented club. In addition, the sides of the red flour beetle's thorax are curved while the confused flour beetle's thorax has straighter sides.

Granary and Rice Weevils (*Sitophilus spp*) damage whole grains or seeds. They do not usually feed on flour or cereals unless it has become caked.

Grain Mites (*Acarus siro*) are pests of food products like cereals, dried vegetable materials, cheese, corn and dried fruits. These mites are often found in conjunction with fungal growth- this is because they reproduce quickly in habitats with high humidity. Severe infestations result in brownish tinge over the commodity, called "mite dust" because of the light brown coloring of the mite legs. This "mite dust" gives off a "minty" odor if the mites are crushed. The life cycle from egg to adult takes only about two weeks at normal room temperatures.
Mites will migrate to other food sources in times of overcrowding.

Damage

Several stages (egg, larva, pupa and adult) of these insects may be present at the same time in infested products. Since schools are generally kept warm, these insects may continually reproduce and many stored product infestations can be found nearly any time of the year.

Prevention

Once a pantry pest infestation is suspected, attempt to identify the pest and locate the source.
Occasionally, the source of an infestation can be very hard to find. Remember that it may be in an unopened package. Look behind appliances where food may have been spilled. Mice will sometimes collect seeds and hoard them in walls, under cupboards or dishwashers where the infestations are nearly impossible to find.
The following tips may be useful.

- Purchase food in package sizes that can be used up in a short time. Do not store food products more than two to four months, if possible.
- When purchasing packaged foods, be certain containers are not damaged, and seals are intact.
- Use older packages before newer ones and opened packages before unopened ones.
- Store dried foods in insect-proof containers such as screw-top glass, heavy plastic or metal containers. This will prevent entry or escape of insects. Cardboard, paper or plastic wrapping will not prevent insect infestations.
- Keep food storage areas clean and do not allow crumbs or food particles to accumulate, as exposed food will attract insects. Cleanliness is especially important in areas where pet foods and birdseed are stored.

Management Options

Inspection and identification of all potential food sources is essential to controlling the infestation. Control

requires locating and discarding all infested items. Do not forget to check unopened boxes or containers because many insects can chew their way into cardboard and foil.

Infested items can be salvaged by freezing three to four days or by being heated in a 140ºF oven for an hour. Empty and thoroughly vacuum cupboards or shelves holding infested food items, especially the cracks and corners. Vacuuming picks up hiding insects and spilled or infested material. To prevent reinfestation, empty the vacuum cleaner or discard the vacuum cleaner bag after use.

Do not use insecticides for controlling these or other insects in pantry areas. Washing shelves with detergent, bleach, ammonia or disinfectants will not have any effect on these pests since these insects lay their eggs on suitable food. Removing infested items and thoroughly cleaning with a vacuum is usually sufficient. As a precaution against reinfestation, store susceptible foods in tightly sealed glass, metal or heavy plastic containers or in the refrigerator or freezer.

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Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org Joseph Berger, Bugwood.org

School IPM Fact Sheet

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.

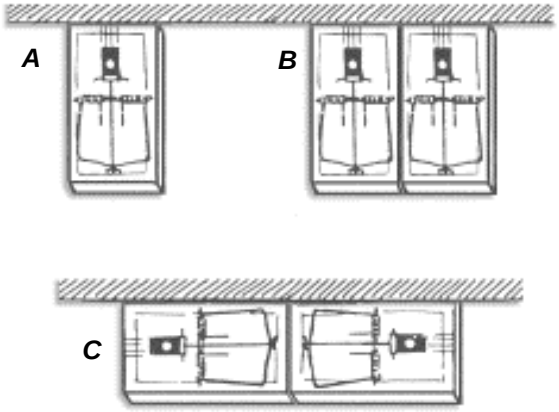
Rodent proofing

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 does 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.

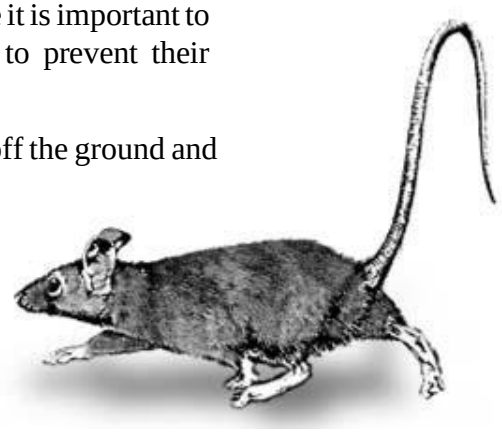
White-footed and deer mice have white feet, usually white undersides, and brownish upper surfaces. They have larger eyes and ears than house mice and most people find them more "attractive." These mice are seed eaters. They also consume fruits, insects, fungi, and possibly some green vegetation. They 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.

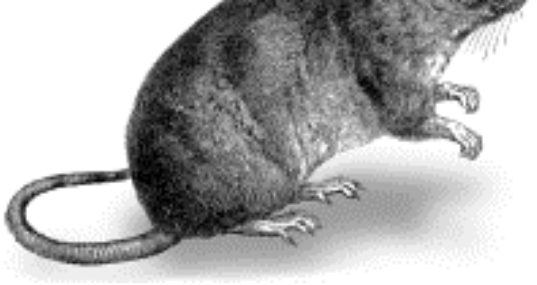
Voles create an extensive system of surface runways 1-2 inches in width with numerous burrow openings. A single burrow system may contain several adults and young. Vegetation near well-traveled runways may be clipped close to the ground. Feces and small pieces of vegetation are found in the runways. 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

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.

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.

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.

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

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

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 include: 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 enable 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 blood meal in order to lay her eggs. Ticks have been known to survive for one year without a blood meal.

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.

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 organism 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.

Recommended Landscape Management Practices for Schools

School grounds can be modified to reduce human encounters with ticks and discourage wildlife hosts of ticks (deer, small mammals and some birds) the landscape more inhospitable to wildlife hosts of ticks (deer and small mammals) and. It is impractical and expensive to institute tick control measures and landscape management practices in all areas of the school grounds, therefore efforts should be focused on frequently used areas such as playgrounds, ball fields, frequently used trails, and areas immediately surrounding the school buildings.

- Keep grass mowed.
- Trim trees and shrubs on the school properties and at the woodland edges to permit more sunlight.
- Remove leaf litter, brush, and weeds at the edge of the lawn to create dry environment in areas where ticks are likely to be found. Avoid planting groundcovers such as pachysandra in areas frequented by people.
- Rake leaf litter and use wood chips or plant shade-tolerant grass under shade trees to reduce tick abundance.
- Reduce cover for mice. Eliminate wooded, brush-covered habitat, prune lower branches of bushes, clean-up storage areas, woodpiles and junk piles. Cleanup and seal stone walls and small openings on school properties.
- Reduce deer habitat or erect deer-exclusion fencing. Avoid landscape plantings that attract deer or use deer-exclusion fencing to keep deer off school properties.
- Move bird feeders away from school buildings.
- Keep playground equipment away from woodland edges and place them on wood-chip or mulch-type foundation.
- Create 3’ or wider wood chip, mulch, or gravel border between turf and woods.
- Widen woodland trails/walkways to permit trail-users to avoid contact with woody vegetation and tall grasses.

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Monitoring for Ticks

Tick populations can be monitored by dragging or flagging. 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.

Personal Protection

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

- Wear light-colored clothing with long-pants tucked into socks when going into tick-infested areas.
- Educate students, families, and school staff about ticks, tick-vectored diseases, and the proper use of repellents.
- Keep to the center of trails to minimize contact with brush and tall grasses.
- Wash and dry clothing at the highest temperature setting upon returning from a tick-infested

area.

- Work with school nurse and administration to develop and implement a school policy regarding student use of repellents at school if students encounter ticks on school properties. Repellents should not be applied under clothing and should be washed off when indoors.
- At the end of the day after being outdoors, carefully inspect the entire body. Carefully remove any attached ticks using fine-tipped tweezers to gently grasp the tick as close to the skin as possible. Pull the tick straight upward with steady even pressure. Save the tick for future identification by placing it in a waterproof, crush-proof container with alcohol.

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.
- Place the tick in a small vial containing rubbing alcohol. Write the date on a piece of paper with a pencil and place it in the vial. Ticks can be identified by University of Maine Extension https://extension.umaine.edu/ipm/tickid/. 207-581-3880 or 800-287-0279 (in Maine).
- Apply rubbing alcohol to the bite and wash hands with soap and water.

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

If tick-vectored disease risk is high, a targeted barrier treatment can reduce tick populations along wooded property edges where human activity is also high, such as along edges of sports fields, along cross-country running trails, and at margins of playgrounds. A single springtime application of an acaracide (tick pesticide) timed to target peak occurrence of deer tick nymphs can be effective. Restrict application 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.

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".

Additional Resources

Tick Safety in Schools. USEPA. https://www.epa.gov/sites/production/files/2014-11/documents/tick-safety-in-schools.pdf

IPM Action Plan for Eastern Ticks. eXtension. http://articles.extension.org/pages/24666/ipm-action-plan-for-eastern-us-ticks

University of Maine Cooperative Extension Tick Identification Service https://extension.umaine.edu/ipm/tickid/. 207-581-3880 or 800-287-0279 (in Maine).

Maine Center for Disease Control and Prevention http://maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/index.shtml

Tick Management Handbook. Stafford, K. 2004. The Connecticut Agricultural Experiment Station. http://www.ct.gov/caes/lib/caes/documents/publications/bulletins/b1010.pdf

Tick Encounter Resource Center. University of RI. www.tickencounter.org

School IPM Fact Sheet

Managing Tree Squirrels

Tree squirrels are occasional pests in urban areas including school buildings. In Maine, there are two spe-cies 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.

Resources for Help with Squirrel Removal

- USDA Wildlife Services, 207-622-8263
- Maine Department of Inland Fisheries and Wildlife, 207-287-8000.
- Maine Warden Service Dispatch Center nearest you,
- Local game warden (listed at ww.maine.gov/ifw/aboutus/contactus.htm) or animal control officer
- Private wildlife control professional

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.

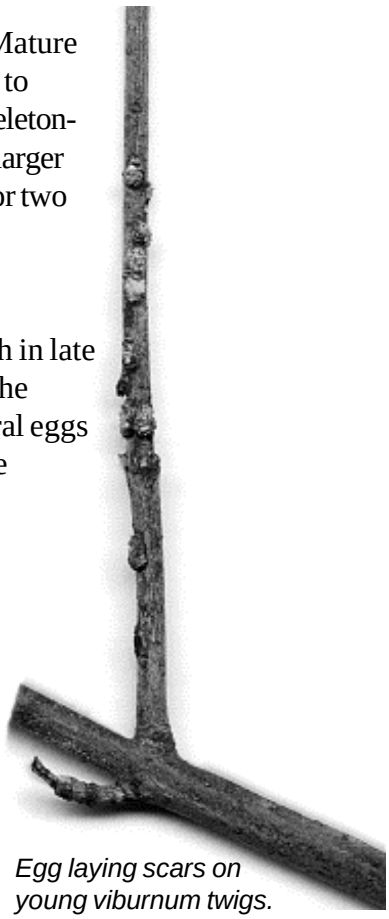
Adults are about 3/8 of an inch long and yellowish to light brown. Mature larvae are larger than the adults (about 1/4 inch), shiny, greenish-yellow to white, and covered with dark dots. The first sign of infestation is young, skeletonized leaves. Both larvae and adults feed on foliage between the midrib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

Life Cycle

Viburnum 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 genera- tion 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 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

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 con- trol. 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 pre- ferred 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. Irrigat- ing 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 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, mugo 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.

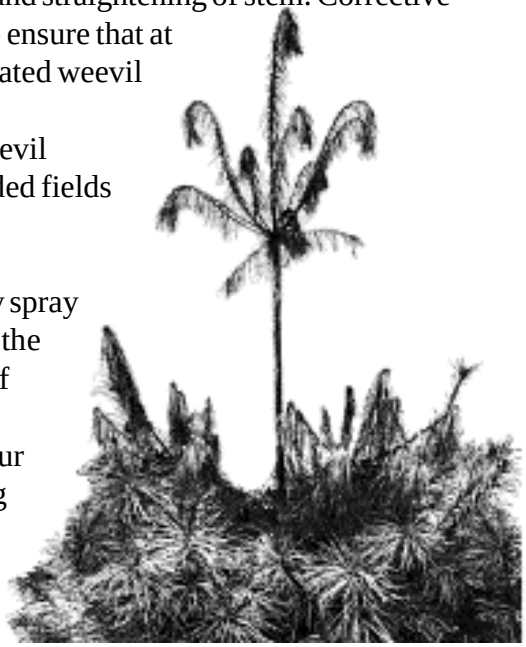
Management

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

Yellow Jackets, 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 yellowjacket 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.

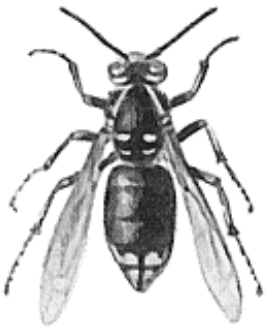
Yellowjackets will nest in the ground (often under shrubs, logs, or rock piles); in hollow trees; among branches of trees or shrubs; under eaves; in hollow fencing, playground structures, and meter boxes; and inside walls. Look for wasps entering and exiting from one of these locations.

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 yellowjackets. If a nearby field of blooming goldenrod is mowed, expect an increase in the number foraging yellowjackets around school buildings and playgrounds.



Baldfaced Wasp

Yellow jacket

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, and 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.

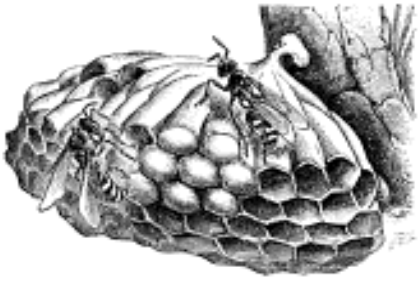
To avoid the risk of stings to students and staff, hire a professional to remove nests. Experienced professionals can vacuum nests located indoors or in sensitive areas where pesticides should not be used.

Using pesticides

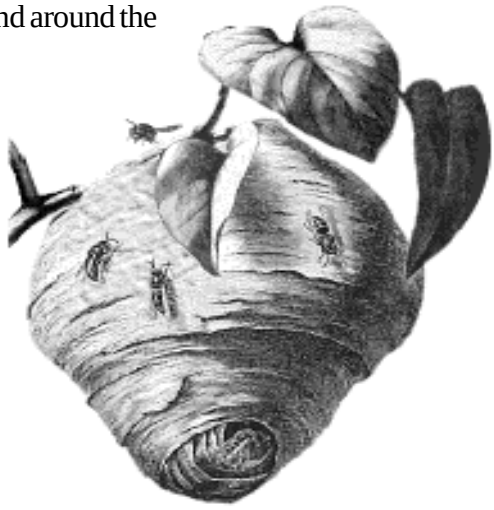
Large paper wasp nests and those in hard to reach locations require a low-toxic spray containing pyrethrin, mint oil, or eugenol. The pesticide treatment kills wasps at the nest as well as the foraging workers who will rebuild the nest on their return. Maine law permits a non-licensed school employee 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".

Turf Management

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.
- Over seed 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.
- Over seed 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.

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".

Best Management Practices for Athletic Fields and School Grounds

#1 Goal—Reduce human pesticide exposure!

- Minimize pesticide use
- Maintain healthy plants
- Choose pest resistant plant varieties
- Apply spot treatments whenever possible
- Choose products proven to be effective at low application rates
- Choose products that leave little or no residue
- Apply when school is not in session or over extended vacations
- Keep people off treated areas for as long as possible
- Check product label for minimum reentry time

Introduction

In 2011, The Maine Legislature directed the Board of Pesticides Control to evaluate the use of pesticides on school grounds and to develop Best Management Practices (BMPs) for pesticide use with a goal of minimizing human exposure to pesticides. This brochure explains how schools should implement these BMPs. Applying these recommendations should also help schools keep maintenance costs down while improving the safety and appearance of school grounds.

Getting Started

Schools should identify the employees who are involved in school grounds maintenance decisions, including the IPM coordinator, the facilities manager, the athletic director and varsity coaches. The IPM coordinator must be included so that management decisions involving pesticides will be consistent with state law and all notification requirements will be followed.

These grounds maintenance decision makers should assign a Grounds Maintenance Priority Level to all school grounds.* How fields are classified will vary by school and by district, based on use, priorities and available funds.

Assigning Grounds Maintenance Priority Levels

The grounds care BMPs are separated into four levels that roughly correspond to the intensity of use and aesthetic importance of each area. High impact varsity athletic fields may be Level 1 or Level 2.

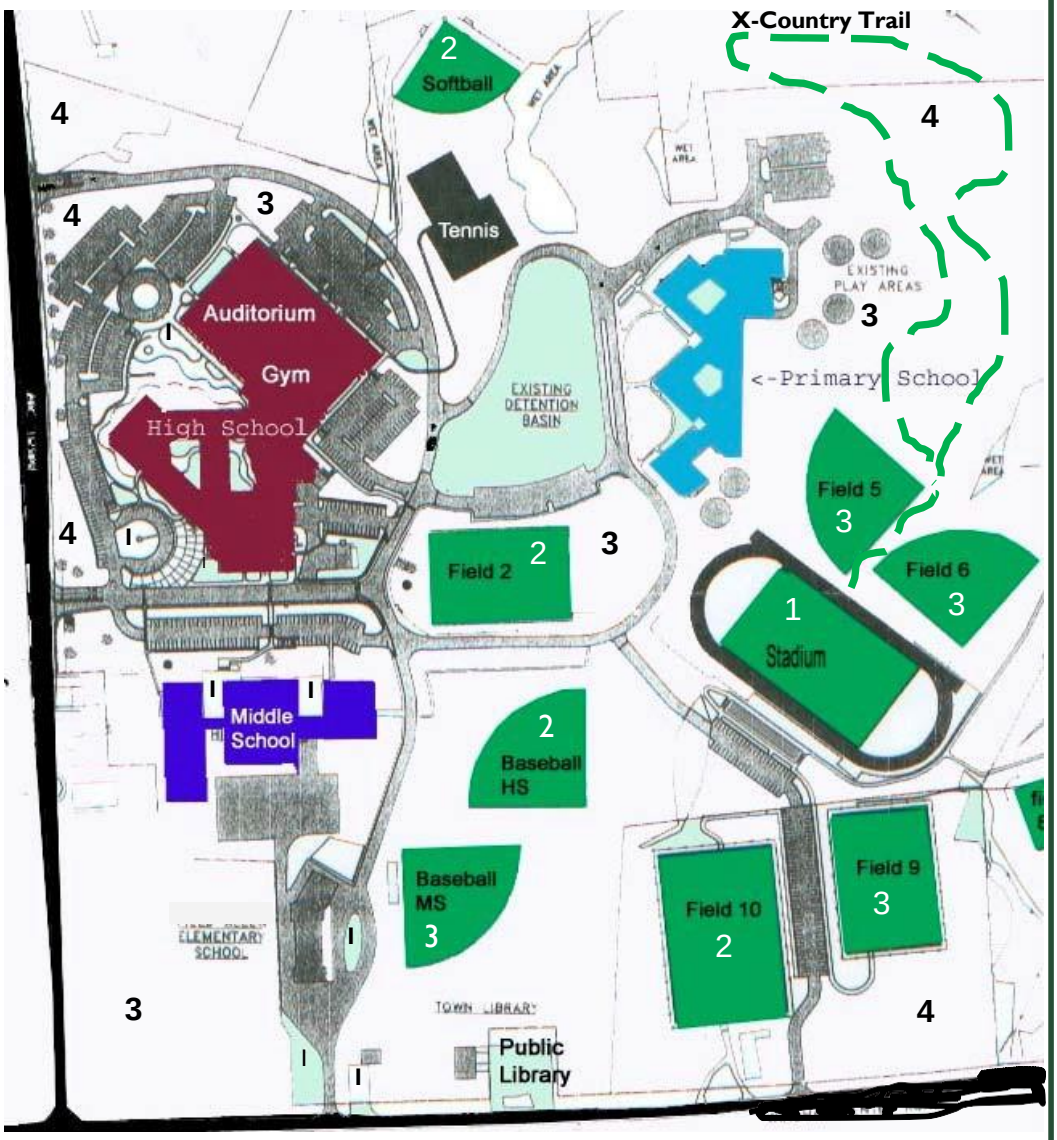
Due to the intensity of use, practice fields that need a high level of maintenance are usually designated Level 2 or 3. Lawn areas and playgrounds generally won't warrant a high level of maintenance and will be assigned to Level 3 or 4. Making a simple map of the maintenance levels for future reference will be helpful to both maintenance personnel and the decision makers (*see map example on opposite side and attached Level-Specific BMPs*).

Other Key Points for Maintaining Quality Grounds and Reducing Risks

- Maintain good communication between staff and contractors involved in grounds maintenance and the IPM coordinator
- Emphasize practices that improve turf density and help minimize need for pesticides
- Identify pests specifically and confirm a pest exceeds threshold levels before authorizing any treatments
- Make sure all pest control products (weed, insect, rodent or plant disease controls) are labeled for use on school grounds and applied by licensed commercial pesticide applicators
- Confirm that all contracts for grounds maintenance services follow these BMPs and the guidelines shown on the opposite side of this bulletin
- Develop a maintenance schedule for the more intensively managed areas so that key steps aren't missed
- Keep detailed records of soil tests, aeration, seeding, top dressing, nutrients and pesticides applied for at least two years

**School grounds means: land associated with a school building including playgrounds, athletic fields and agricultural fields used by students or staff of a school and any other outdoor area used by students or staff including property owned by a municipality or a private entity that is regularly utilized for school activities.*

Grounds Maintenance Priority Levels



Numbers indicate the grounds maintenance priority level

Grounds Maintenance Priority Levels

Level 1—Highest care areas, e.g., some varsity playing fields

Level 2—High care areas, e.g., practice fields or multipurpose fields. May include varsity fields or high visibility lawn areas depending on the school

Level 3—Moderate care areas, e.g., playgrounds, low-use areas, common areas. May include practice fields and some lawn areas depending on the school

Level 4—Lowest care areas, e.g., most lawn areas, natural areas, fence lines, property edges, slopes, utility areas, ditches or trails

Other Important Guidelines

Informed Product Choice

- Read labels and MSDS thoroughly prior to making a choice
- Choose products with proven efficacy at low use rates
- Choose products that pose the lowest exposure potential (watered into the soil, little to no surface residues, low volatility & low drift potential)
- Choose selective products that affect a narrow range of organisms
- Avoid products like weed and feed that require broadcast application

Grounds maintenance 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-risk 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 responsibility of the school district

FOR MORE INFORMATION:

Maine Department of Agriculture, Conservation and Forestry

- Maine Board of Pesticides Control
  thinkfirstspraylast.org
- Maine School IPM Program
  www.maine.gov/schoolipm
  207-287-2731
  28 State House Station, Augusta, ME 04333-0028
- **University of Maine Cooperative Extension**
  extension.umaine.edu/ipm/
  207-581-3880
  491 College Ave, Orono, ME 04469-5741

Adopted by BPC 2/24/2012

Level Specific BMPs for Athletic Fields and School Grounds

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
	High impact athletic game fields, e.g. varsity football, soccer, field hockey fields	• Low impact athletic game fields, e.g. baseball, softball • Multipurpose fields • Athletic practice fields	• High visibility lawns • Moderate use areas • Playground fields	• Utility areas, slopes, ditches • Natural areas • Fence lines/property edges • Lawns
Field Use Restrictions	• Whenever possible restrict field use when soils are saturated and surface water is present • If field size allows, move goal areas regularly			
Soil Test	At establishment and before renovation and every 1-3 years when pH needs to be adjusted Every 2 – 5 years otherwise Soil test should determine: • Nutrient levels • pH • Level of compaction • Soil texture and structure (Level 1 only) • Percent organic matter • Thatch depth • Rooting depth		At establishment and before renovation or repair and every 1-3 years when pH needs to be adjusted Every 3 – 5 years other wise • test for nutrient levels and pH	At establishment and before renovation test for nutrient levels and pH
Irrigation for Maintenance of Established Turf	• Supplement rainfall when needed to provide a total of 1" of water per week when grass is actively growing (April – November) • Water turf early in the morning	• As needed to promote active turf growth and prevent summer dormancy • Water turf early in the morning	Only required during renovation or repair, otherwise allow summer dormancy	
Aeration	• 2-6 times/year at a depth of 3-12 inches using a combination of hollow core, solid tine, or shatter aeration • At least one of the aerations should be deep tine or shatter to a depth of at least 8 inches • Intense use areas require the most aeration • Avoid spring aeration when seeding of crabgrass or other summer annuals is a threat	• 1-2 times/year as needed • Use a combination of hollow core, solid tine, or shatter aeration at a depth of 3 – 8 inches • Avoid spring aeration when seeding of crabgrass or other summer annuals is a threat	• Once every two years or as needed • Avoid spring aeration when seeding of crabgrass or other summer annuals is a threat	Never

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Fertilization and Nutrients	• Only apply amendments and nutrients as indicated by soil test, including phosphorus and potassium • Follow soil test recommendations when establishing new seed • Apply N at a rate of 2-4 lbs per 1,000 sq.ft per year in several applications rather than all at once • Fertilize frequently (7 to 10 applications) throughout the season • Apply no more than 0.5 pound of soluble nitrogen per 1,000 square feet per application • Slow release nitrogen (N) fertilizers that are 40-60% water insoluble can be applied at higher rates and less often • Fertilizer rate should be reduced or fertilization eliminated during hot and dry periods unless irrigation is available • Sand based fields may require additional fertilizer • Apply calcitic or dolomitic limestone in spring and/or fall to maintain soil pH within the 6.0 – 6.5 range and to meet soil	• Only apply amendments and nutrients as indicated by soil test, including phosphorus and potassium • Follow soil test recommendations when establishing new seed • Apply N at a rate of 1-3 lbs per 1,000 sq.ft per year with 2/3 in the fall and 1/3 in the spring • Apply in several applications rather than all at once • Apply no more than 0.5 pound of soluble nitrogen per 1,000 square feet per application • Slow release nitrogen (N) fertilizers that are 40-60% water insoluble can be applied at higher rates and less often • Apply calcitic or dolomitic limestone in spring and/or fall to maintain soil pH within the 6.0 – 6.5 range and to meet soil test requirements for calcium or magnesium	• Only apply amendments and nutrients as indicated by soil test, including phosphorus and potassium • Follow soil test recommendations when establishing new seed • If the turf begins quality is not acceptable, apply N at a rate of 1-2 lbs/1,000 sq.ft per year with 2/3 in the fall and 1/3 in the spring • Apply no more than 0.5 pound of soluble nitrogen per 1,000 square feet per application • Slow release nitrogen (N) fertilizers that are 40-60% water insoluble can be applied at higher rates and less often • Apply calcitic or dolomitic limestone in spring and/or fall to maintain soil pH within the 5.5 – 6.5 range and to meet soil test requirements for calcium or magnesium	• Follow soil test recommendations when establishing new seed • Seldom to never after establishment
Mowing	• Proper mowing height and frequ ency prevents weeds • Mow to greatest height tolerable for the sport, e.g. 1 to 3 inches depending on type of sport and required playing schedule • Mow to 3 inches or higher durin g off-season and gradually lower to desired height for play over s e veral mowings • Do not remove more than 1/3 of plant height at each mowing • Keep mower blades sharp • Unless the turf has an active fun gal disease or play will be interrupted, return the grass clip pings • Use a mulching mower		• Proper mowing height and frequency prevents weeds • Mow to a height of not less than 3 inches • Do not remove more than 1/3 of plant height at each mowing • Keep mower blades sharp • Whenever possible return the grass clippings • Use a mulching mower	• Mow as needed to maintain function of area • Do not remove more than 1/3 of plant height at each mowing when appropriate for the site, use and grasses present • Keep mower blades sharp • Whenever possible return the grass clippings • Use a mulching mower • Utility and low maintenance turf areas need only be mowed in late fall

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Seeding	• Depending on level of management available, athletic fields should be either a 100% blend of Kentucky bluegrass cultivars, or a 100% blend of improved turf-type tall fescue cultivars, or a mix of Kentucky bluegrass and perennial ryegrass • Maintain vegetative cover by repeated seeding any time soil is exposed. This may be 4-8 times/year • Mid-August-early October is ideal timing • Mid-April-early June to repair worn areas • Select hardy, wear-, pest-, and drought-tolerant grass seed species and cultivars including: tall fescues, perennial ryegrass and Kentucky bluegrass • Use a variety of seeding strategies: ▪ Drill seed in 2 to 4 directions ▪ Use pre-germinated seed and sand mix to fill worn areas and divots ▪ Broadcast seed before each game to allow players to "cleat-in" the seed ▪ Broadcast seed prior to dragging aeration cores	• Lawns should be primarily mixtures of fine fescue or tall fescue with limited Kentucky bluegrass or perennial ryegrass • Higher traffic areas should be seeded with mixes that contain a low percentage of fine fescues • Mid-August through early-October as needed • April to repair worn areas or establish new grass areas • Drill seed or broadcast seed and drag in combination with aeration • Select hardy, wear-, pest-, and draught-tolerant grass seed mixture including tall fescues, perennial ryegrass and Kentucky bluegrass	• Lawns should be primarily mixtures of fine fescue or tall fescue with limited Kentucky bluegrass or perennial ryegrass • Higher traffic areas should be seeded with mixes that contain a low percentage of fine fescues • Repair as needed to maintain turf density and prevent erosion • Without irrigation, seed only September to mid-October when adequate moisture is anticipated	• Lawns should be primarily mixtures of fine fescue or tall fescue with limited Kentucky bluegrass or perennial ryegrass • Higher traffic areas should be seeded with mixes that contain a low percentage of fine fescues • Utility areas can be seeded with native conservation grasses, forbs or perennial flowering plants • Repair as needed to maintain turf density and prevent erosion • In September when adequate moisture is anticipated
Seeding continued	• Irrigation is essential during germination and establishment of new seed • Choose seed mixtures based on soil type and intensity of use • Rescue seeding can be done with high quality perennial ryegrass blends • For seed selection use the National Turf Evaluation Program spreadsheet[++]			
Re-sodding	• Intense use areas, such as soccer goals and between the hash marks on football fields, every 1 to 3 years as needed • Irrigation is essential at installation and during grow-in period	• Intense use areas, such as around pitcher's mound or baseball infields • Irrigation is essential at installation and during grow-in period	Never	Never

[++]http://apps.hort.iastate.edu/turfgrass/extension/InteractiveNTEPSpreadsheet.xlsm

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Topdressing	• Apply in combination with aeration to prepare seed bed, modify soil and smooth field • Use finished composts with low nitrogen and phosphorus content, or • Use a soil mix that is similar to the existing soil in the root zone • In all cases avoid forming soil layers which may cause shallow rooting depth and interfere with water movement in the soil		Never	Never
Weeds	• Following the previous BMPs will establish a healthy, thick turf which will outcompete broadleaf weeds • Depending on weed species present, accept up to 15 - 20% weeds	• Following the previous BMPs will establish a healthy, thick turf which will outcompete broadleaf weeds • Depending on weed species present, accept up to 20 - 30% weeds	• Hand-pull weeds, use a weed whacker or use heat or steam to kill weeds • Use mulch in flower beds and around landscape plantings to reduce weeds • Use landscape fabric under playground shock absorption materials • Depending on weed species present, 50% weeds or more is acceptable in most lawns • Use broadleaf herbicides only when needed, based on monitoring, to reduce weed populations to acceptable levels • Use targeted spot treatments whenever possible and avoid broadcast applications	• Hand-pull weeds • Use a weed whacker, heat or steam around fences and other structures • Spray fence lines only when necessary and schedule when students will not be in the area for several days • Use herbicides to control invasive and noxious plants when necessary • Use targeted spot treatments whenever possible and avoid broadcast applications
	• Use broadleaf herbicides only when needed, based on monitoring, to reduce weed populations to acceptable levels • Use targeted spot treatments whenever possible and avoid broadcast applications • Coordinate any herbicide use with annual over-seeding program so desirable turf seed is not damaged • Apply pre-emergent herbicide in spring primarily for crabgrass if needed, based on weed monitoring during the previous year • Broadleaf weed control every 2-3 years, only as needed • Broadleaf weed control in spring or fall is more effective, but to reduce student exposure applications may be more acceptable during the summer when school is not in session • Summer herbicide applications should only be done when the weeds are actively growing • When weeds are drought stressed, water the area to be treated for a few days prior to herbicide application • Herbicides should not be applied in temperatures above 85° F to avoid turf damage and reduced efficacy • Effective post-emergent crabgrass control is available and may be used as an alternative to routine pre-emergent crabgrass applications when areas of crabgrass are limited			

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Insect Pests • **White Grubs** are the larvae of Japanese beetles, May/June beetles, European Chafers, Asiatic garden beetles, Oriental beetles and other scarabs. Turf injury occurs from late July through November and from April - June and is often localized. A site-specific strategy should be practiced • **Action Thresholds** for non-irrigated turf (grubs/sq.ft.) Action thresholds may be increased 30% with irrigation • **European chafer: 4 to 6/sq.ft.** • **Japanese beetle: 6 to 12/sq.ft.** • **Oriental beetle: 6 to 12/sq.ft.** • **Asiatic garden beetle: 10 to 20/sq.ft.**	• Monitor July-September • Beginning of spring and fall sports seasons coincides with peak turf injury from white grubs • Action threshold levels are species dependent (see cell to left) • Irrigate as needed to promote grass root growth throughout the growing season • Insect parasitic nematodes can be very effective when applied properly[%%] • Consider preventative grub control applications on fields that are infested more than 2 – 3 years in a row	• Monitor July-September • Action threshold levels are species dependent (see cell to far left) • Irrigate as needed to promote grass root growth throughout the growing season • Action thresholds may be doubled with irrigation • Insect parasitic nematodes can be very effective when applied properly[%%]	• Monitor July-September • Scarab beetles (adult white grubs) often avoid laying eggs in low maintenance non-irrigated turf • Action threshold levels are species dependent (see cell to far left) • Action thresholds may be doubled with irrigation • Insect parasitic nematodes can be very effective when applied properly[%%]	Pesticide treatment never required
Insect Pests • **Chinch Bugs**	• Supplement rainfall when needed to provide a total of 1" of water per week during summer • Avoid over-fertilizing to prevent thatch build-up. Dethatch and/or core aerate if thatch exceeds ¾ inch • Pesticide applications only as needed when damage is evident and more than 5-10 chinch bugs per sample using coffee can-float monitoring method[&&] • If seeding, select resistant, endophytic varieties of tall fescue, perennial ryegrass or fine fescue suitable for athletic fields		• If seeding, select resistant, endophytic varieties of tall fescue, perennial ryegrass or fine fescue suitable for athletic fields	• If seeding, select resistant, endophytic varieties of tall fescue, perennial ryegrass or fine fescue suitable for athletic fields
Turf Diseases[@@] • **Brown Patch** • **Dollar Spot** • **Leaf Spot**	• Apply no more than 0.5 pound of quick release nitrogen per 1,000 square feet per application • Time fertilization and liming to avoid disease critical periods (e.g. avoid fertilization in early spring and just before hot, humid weather) • Remove dew from fields early in the morning, by dragging with a bar • Improve air circulation over turf areas • Irrigate early in the morning only			
Turf Diseases[@@] • **Snow Mold**	• Avoid fertilizing turf after mid-October • Continue mowing until growth ceases and gradually increase or reduce mowing height to achieve 2 inches at last mowing • Overseed with tolerant grasses and resistant cultivars, especially if damage has been severe			

[%%]http://www.yardscaping.org/lawn/documents/Beneficial_Nematodes.pdf
[&&]http://www.gardening.cornell.edu/lawn/lawncare/pestpro.html
[@@]http://extension.umass.edu/turf/publications-resources/best-management-practices

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Other Pests • **Mice, Rats or Other Rodents**	• Seal or fill in all potential nesting sites • Reduce potential food sources by maintaining covered and sealed dumpsters and trash cans • Clean up all food scraps and waste left out by students, staff or visitors • Avoid installation of bird feeders • Compost piles or bins should be inaccessible to rodents			

• **Stinging Insects**
  • **Yellowjackets**
  • **Wasps**
  • **Hornets**
  • **Bees**
	• Beginning in early spring, monitor for stinging insect hives or nests and remove before they become established
	• Fill in abandoned animal dens (including rodent burrows) in areas students use
	• Seal cracks and crevices within walls of buildings and on play structures
	• Restrict outdoor eating and drinking in the late summer/fall when yellowjackets are foraging
	• Keep garbage cans covered
	• Install stinging insect traps outside of areas that people frequent
	• Use RTU aerosol sprays in emergency situations			

• **European Red Ants** are stinging insects found primarily along the coast. Nests in a variety of habitats including bark mulch, lawns, forested areas, leaf litter, and under rocks and human debris	Contact the University of Maine Cooperative Extension (1-800-287-0279) to confirm suspected infestations and obtain current management recommendations			
• **Mosquitoes**	• Eliminate sources of standing water and keep all roof gutters free flowing • When monitoring indicates the potential for mosquito vectored disease, restrict outdoor activities to mid-day • Encourage students, staff and visitors to use insect repellents during activities that expose them to biting mosquitoes • When the Maine CDC determines there is a credible threat for mosquito-borne disease near a school, consider hiring a licensed commercial pest management company to apply mosquito controls			
• **Ticks**	• Move all play structures or class areas at least 3 yards away from forest or brushy edges of school yards • Install a 3 foot wide strip of mulch or crushed rock next to any forest or brushy edges of school yards • Do not allow students to walk into forest or brushy areas next to schools • Keep trails cleared to at least a 6 – 8 foot width to prevent students from brushing up against brushy areas • Remove stone walls or other structures that provide harborage for squirrels, mice and other small mammals • Do not feed birds or other animals on school grounds • Encourage students, staff and visitors to use insect repellents during activities that might expose them to tick habitats • Encourage proper attire to prevent ticks from accessing skin areas • Encourage tick checks each time students and staff enter tick habitats • Keep play areas mowed • Avoid any pesticide application to control ticks unless students or staff must frequently use forest or brushy areas that provide suitable deer tick habitat and deer tick numbers are high			

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Artificial/Synthetic Turf	• **Do not** apply disinfectants or sanitizers to the field on a routine basis • Use disinfectants only when necessary to clean up blood/body fluids; follow specific label directions to clean and decontaminate against HIV on surfaces soiled with blood/body fluids • To remove mold, dirt or dust, clean field with detergent and surfactant • To remove small leaves, seeds or other small debris, use leaf blowers, rakes or sweepers, being careful not to displace large amounts of infill material • To remove gum, freeze it with ice cubes or aerosol freezing agents • Inspect all equipment for leaks before operating on the field • Monitor and maintain proper infill depth by topdressing just prior to sweeping and grooming • Follow manufacturer guidelines for sweeping and grooming • Go over the field with a magnet periodically to pick up stray metals • For static, apply wetting agents to the infill • Use extreme care when removing snow or ice from the field so not to move the infill or tear seams • Keep all sources of fire or ignition away from the field surface • Never fill gasoline tanks on the field • Aerate infill materials to maintain G-Max value for every test point at less than 200g's (as measured in accordance with ASTM Standard F355-A and ASTM Specification F1936			

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 sea- son, 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 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

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

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 turfgrass 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 fungus, which 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

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.

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' Pest Management Activity Logbooks.

IPM Contact Information

School District:_____

Address _____

_____

Telephone: _____

School IPM Staff	Name/Position	Telephone/Fax	Schedule
IPM Coordinator:			
Administrative Contact:			

Contracted Pest Management Company Name_____

Address:_____

Office Telephone:_____

Primary Technician Name and Phone:_____

Contracted Turf Care Company

Name_____ Phone_____

Other Contacts (eg contracted custodial service, maintenance service, etc)

Name_____ Phone_____

Pest Management Activity Log
Page 1—Pest Sighting/Monitoring/IPM

Use this page for monitoring and general IPM steps taken. Assign a unique number in the last column to reference to Page 2—Trap and Bait Station Monitoring or Page 3—Pesticide Application

Site_____(can be building, room, field, playground, etc)

Date/ Time	Pest(s) or Evidence Seen/ Extent of Infestation	Specific Location (under sink, west goal soccer field, etc.)	By Whom	Company	IPM Steps Taken*	Ref.. No. **

**Including monitoring for pest presence or conditions conducive to a pest outbreak, pest identification, and non-pesticide control measures taken. See Chapter 27 Section 5C*

*** Assign a unique Reference Number and match to traps and bait station monitoring on page 2 or a pesticide application on page 3.*

Pest Management Activity Log
Page 2—Trap and Bait Station Monitoring

Use this page when Traps and Bait Stations are used. The Reference number should connect to the last column on Page 1—Monitoring/IPM

Site_____(can be building, room, field, playground, etc)

Ref. #	Trap Type	Room # or Name	Location Description	Date Trap Checked	Trap Missing?	# of Specimens

Pest Management Activity Log
Page 3—Pesticide Application Authorization and Record

Use this page when pesticide applications are necessary. Use the chart to determine if authorization, notification and/or signage is required. The Reference Number refers to a matching pest sighting entry on Page 1—Monitoring/IPM in the logbook.

Site_____(can be building and room, field, playground, etc)

Reference Number from Monitoring/IPM page _____

1) What is the pest? How was the pest identified?

2) How was it determined that a pesticide application was necessary? Include information about the safety, economic or aesthetic threshold reached (see Chapter 27 section 5C)

3) Application information:

Date/Time _____ Applicator Name _____

Product Trade Name _____ Applicator License # _____

EPA Reg # _____ Company _____

Specific Location (under sink in room 100, west goal JH soccer field, etc) _____

4) Identify the type of application from the chart and continue to the required sections below.

Check one	*See BPC Chapter 27 Section 3 for details about specific pesticide applications*	**IPM coordinator authorization**	**5 day prior notice to parents, guardians, staff**	**Signs posted 2 days prior to application**
	For urgent control of stinging or biting insects	required (go to 5)	NA	NA
	General use antimicrobial products for cleaning	NA	NA	NA
	Paints, stains or wood preservatives	NA	NA	NA
	Injected into cracks, crevices or wall voids	NA	NA	NA
	Bait blocks, gels, pastes, granular and pelletized materials in areas inaccessible to students	NA	NA	NA
	Indoor application with no re-entry or restricted entry interval, but entry is restricted for at least 24 hours	NA	NA	NA
	Mosquito control when Maine CDC has identified arbovirus positive animals in the area	NA	NA	required (go to 7)
	In facilities used for agricultural or horticultural education (see Chapter 27 section 3D)	NA	NA	required (go to 7)
	Any other applications made while school **is not** in session*	required (go to 5)	NA	required (go to 7)
	Any other application made while school **is** in session*	required (go to 5)	required (go to 6)	required (go to 7)

(Use the chart above to determine which of the following are required. For further clarification consult BPC Chapter 27)

5) Authorization by IPM coordinator _____
signature date

6) Date notification sent to parents, guardians and staff: _____

7) Date and locations of signs posted: _____

*School is considered to be in session during the school year including weekends. School is not considered to be in session during any vacation of at least one week. *Revised 5/15/15*

Indoor Pesticide Application Records

School_____

Note: For outdoor applications use the form on the following page.

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

Outdoor Pesticide Application Records

School Name_____

PESTICIDE APPLICATOR LOG

Company Name:

Applicator Name(s):

License Number (s):

1.

Date	Start Time	Finish Time	Address, Town/ Field Location[1]	Size of Treated Area[2]	Sensitive Area[3] Yes/No	Site or Crop	Target Pest	Wind Speed & Direction	Weather Conditions Temp	Weather Conditions Cloud Cover	Weather Conditions Time Noted[4]	Pesticide(s) and Diluent Applied[5]	Rate Description Undiluted	Rate Description Mix	Rate Description Mix Ratio	Application Method

1 - Be specific, street address, etc. Use abbreviations if needed.
2 - Acres or other unit of measure you normally use, eg. 1000 sq ft, tree-volume, acre-ft., linear miles, etc.
3 - If sensitive areas are present, a description or map is required.
NOTES:

4 - Note weather conditions every two hours, more often if conditions change.
5 - Use the pesticide key at the front of this Logbook to record pesticide brand name, active ingredient, EPA registration number and restricted entry interval or air concentration interval.
If you make an incorrect entry - DO NOT ERASE - cross out the error and write in the correction

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 kitchen Areas			
Dishwashing areas			
Garbage/Trash areas			
Tray return area			
Storage areas for pots/pans/plates			
Other_____			
Utility Areas and Bathroom			
Sinks and toilets			
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:		

Planning and Notification Templates

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IPM Policy Statement

All Maine schools are required to adopt and implement a written IPM policy. Customize the following (can be downloaded at www.maine.gov/schoolipm) or obtain a sample IPM Policy from Maine School Management Association.

Sample IPM 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 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 and Signage Requirements

1. **A notice about the school's IPM policy and pesticide use must be provided in the student/parent and staff handbooks** (see sample notice on following pages) **which includes the following information:**
   - That an IPM policy exists and where it can be viewed,
   - That pesticides may be periodically applied in buildings and on grounds,
   - That the school will provide notification of specific pesticide applications (unless the type of application to be made is exempt from this requirement),
   - Where the a) IPM policy, b) a copy of the Standards for Pesticide Applications and Public Notification in Schools rule (CMR 01-026 Chapter 27), and c) the Pest Management Activity Log (pest monitoring and pesticide application records) are available for review
   - How to contact the school's IPM Coordinator

2. **For each non-exempt pesticide application*, notice must be provided to parents and staff at least five days prior to the application which includes the following:**
   - Trade name and EPA Registration number of the pesticide to be applied,
   - Approximate date and time of the application.
   - Location of the application.
   - Reasons for the application.
   - Name and phone number of the person to contact for more information about the application.

   The following pesticide uses are exempt from 5-day prior notice requirement:
   - Non-powered application of ready-to-use pesticide to control or repel stinging or biting insects is urgently needed to protect health or safety of occupants.
   - Non-powered application of general-use antimicrobial products for routine cleaning.
   - General-use paints, stains or wood preservatives.
   - 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 application of a pesticide with no re-entry or restricted entry interval specified on its label when entry to treated area is restricted for at least 24 hours.
   - When Maine Center for Disease Control has identified arbovirus positive animals (including infected ticks and mosquitoes) in the area.
   - Agricultural and horticultural education facilities, if parents, staff and students are informed about the potential for pesticide application in such areas and students are trained according to federal Worker Protection Standards.

3. **Signage requirements**

- For non-exempt pesticide applications (see ‘5-day exemptions’ above), a sign must be posted at each point of access to treated area and in common area of schools at least two working days in advance (see sample signs on following pages).

All Maine schools are required to publish a notice about their IPM policy in the schools' policy manuals or handbooks such as student and staff handbooks (downloadable template available at www.maine.gov/schoolipm)

Notice Regarding School Integrated Pest Management (IPM) Policy

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. 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 notification signs will also be posted in school and on school grounds. Notification may 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 _____at _____. 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.maine.gov/schoolipm.

Sincerely,

Sample Notice of Planned Pesticide Application

Customize and distribute to parents and staff five days in advance of pesticide application (*Download this form at www.maine.gov/schoolipm*)

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 _____ (*specific location*)

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 the 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 _____.

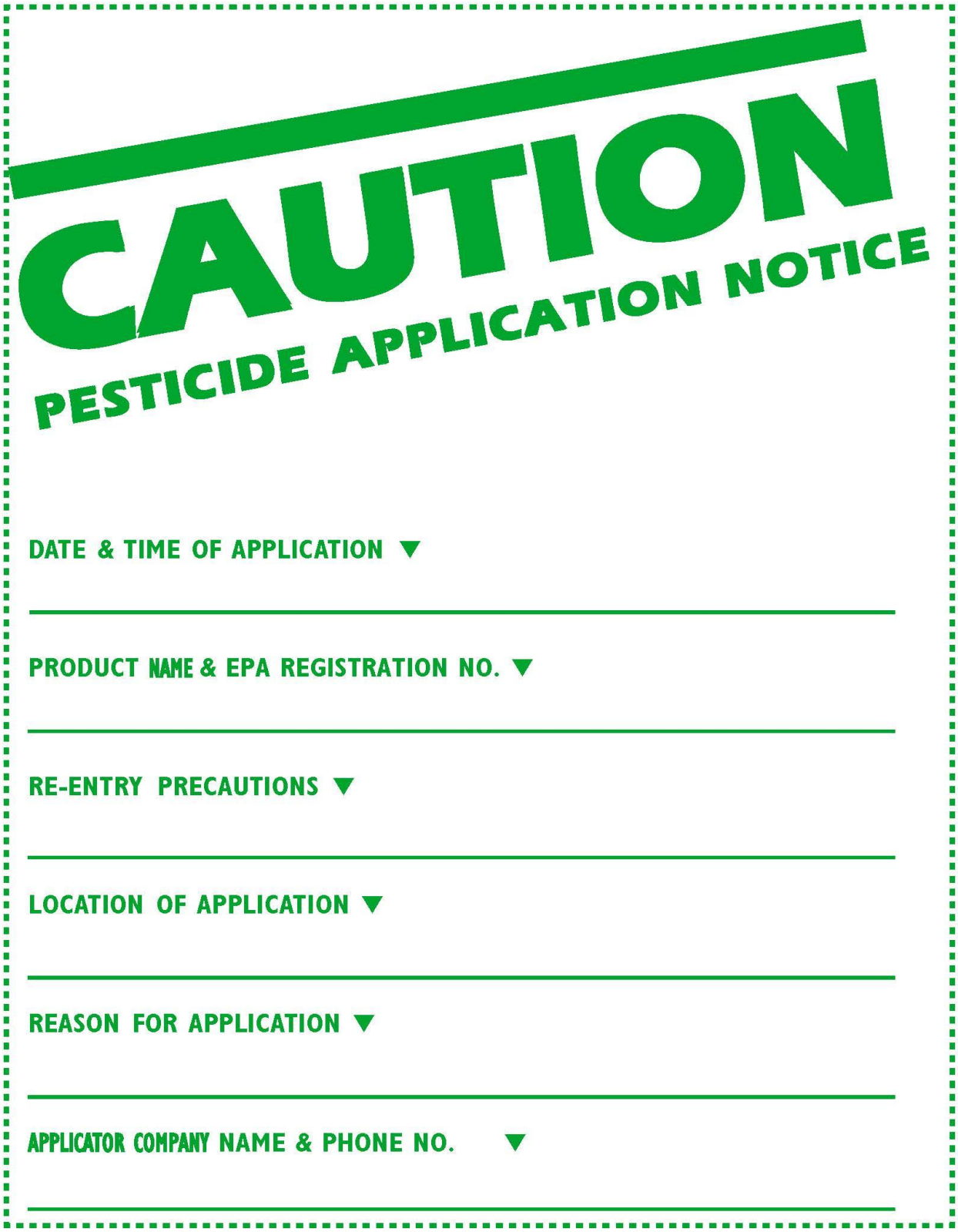
Sincerely,

Outdoor Pesticide Application Notice Sign

Post at access points of area to be treated outdoors and at a central communication point at the main office of the school. Sign must be at least 5 inches wide by 4 inches tall, made of rigid, weather resistant material, bear the Board designated symbol (child, adult, and dog in crossed circle) and state a date and/or time to remove the sign.

Indoor Pesticide Application Notice Sign

Post at each point of access to treated area and at common area of the school at least two working days prior and 48 hours after the application. Sign must be at least 8.5 inches wide by 11 inches tall.



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
Groundskeeper
School Nurse
Teacher
Student
PTO Representative
Pest Control Contractor
Lawn Care 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 teacher's room, and the boy's locker room.
- House mice - kitchen, pantry, and basement.
- German cockroach - kitchen, teacher's 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 EPA 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 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

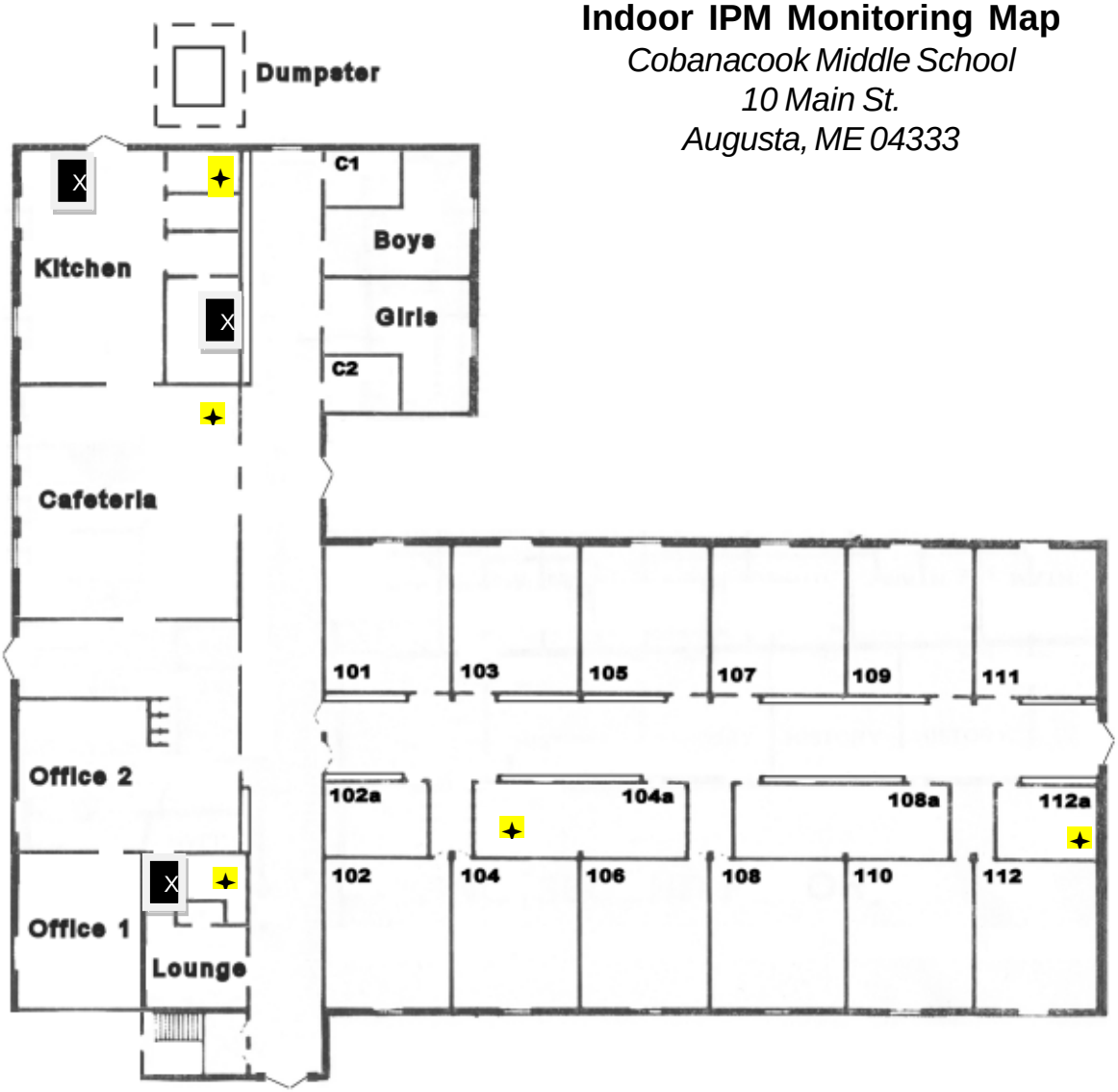
Whenever practical, the Cobanacook Middle School will minimize the use of pesticides to control or limit pests. Along with sanitation and maintenance actions to eliminate food, water, shelter, and entryways for pests, non-pesticide traps will be used to reduce pests when practicable and effective. Proper 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



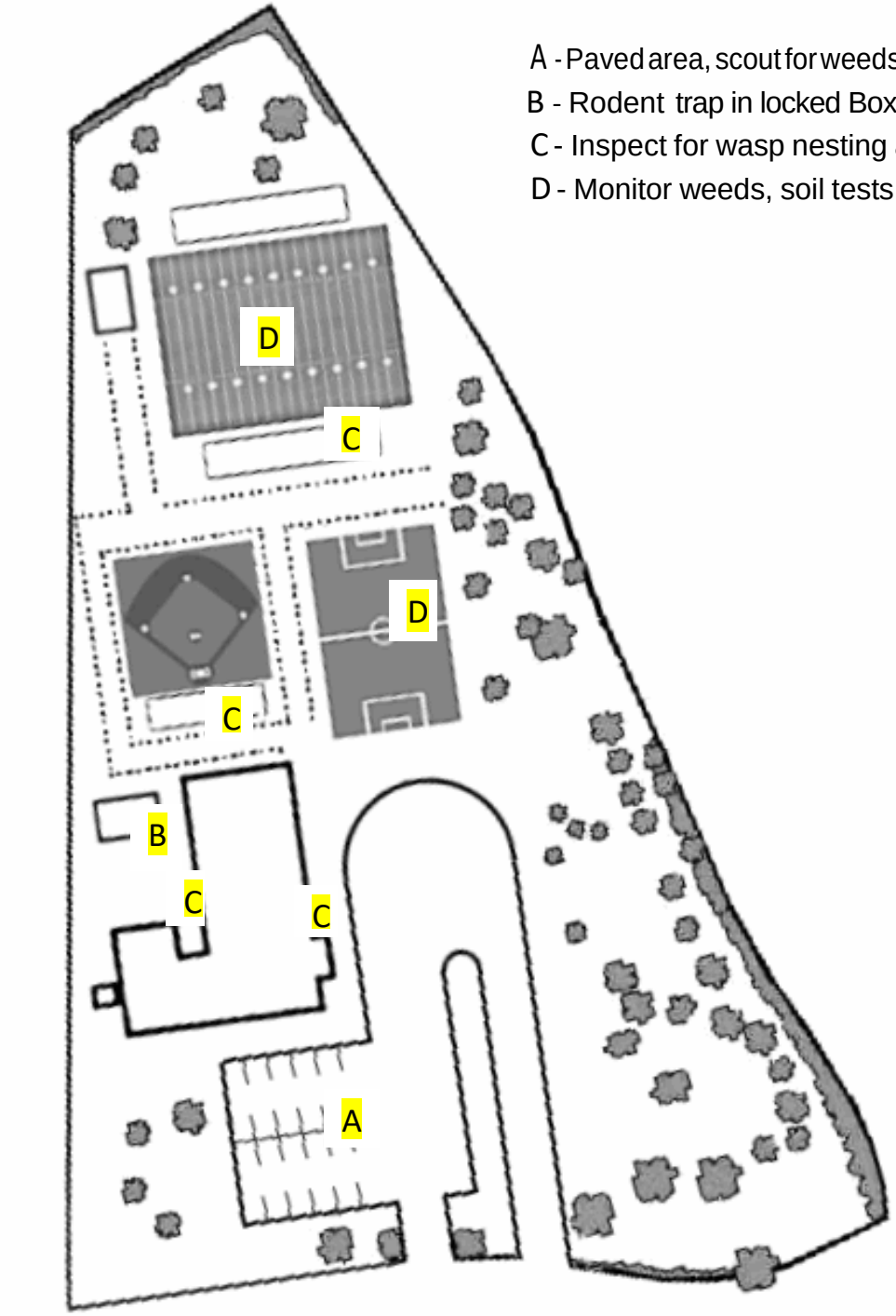
Monitoring traps:

Mouse 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.

Outdoor IPM Monitoring Map

Cobanacook Middle School
10 Main St.
Augusta, ME 04333



A - Paved area, scout for weeds bimonthly
B - Rodent trap in locked Box
C - Inspect for wasp nesting activity
D - Monitor weeds, soil tests

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 Integrated Pest Management—a sensible and proactive approach. 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 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.
- Assist your child in keeping his/her backpack clean and organized.
- Leave pets at home.
- If you find fleas, bed bugs or cockroaches at home, talk with school about procedures to prevent pests hitchhiking to school on clothing and backpacks.
- Notify the school of any other pest-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 responsibility 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.

F. Proposed materials and equipment for service: The contractor shall provide current labels and safety data sheets (SDS) 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. **IPM Policy and Plan**: A copy of the contractor's approved pest management plan, including labels and Safety Data 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 contractor 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 non-approved 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 non-pesticide methods:** The contractor shall use non-pesticide 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.

Appendix

Maine School IPM Resources

Location	Resource Area	Phone	website
Maine Department of Agriculture, Conservation and Forestry School IPM Program	School IPM: manuals, guidelines, fact sheets, training and more	207-287-7616	www.maine.gov/schoolipm
University of Maine Extension Pest Management Office	Identification and management recommendations for Insects, ticks, plant diseases, weeds	800-287-0279	extension.umaine.edu/ipm/
Maine Forest Service	Tree pests, browntail moth	207-287-2431	www.maine.gov/dacf/mfs/forest_health/
Maine Board of Pesticides Control	Pesticide questions and pesticide applicator licensing and training	207-287-2731	www.thinkfirstspraylast.org

Pesticide Applicator Training Manuals

Available through the University of Maine Pest Management Office, 1-800-287-0279

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

Manuals for School IPM

Available at www.maine.gov/schoolipm

Outdoor Integrated Pest Management for Maine Schools

Integrated Pest Management for Northeast Schools (Indoor Pests)

Pesticide Resources

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

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

And

Maine Department of Environmental Protection
207-287-7688
800-452-1942
<http://www.maine.gov/dep/index.shtml>

Report hazardous substance inventory to:

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.maine.gov. *This list does not constitute an endorsement of any company or product listed, nor is it intended to be a comprehensive listing.*

Beneficial Insects and Nematodes (for control of pests in turf, greenhouses, agriculture)

See: Association of Natural Biocontrol Producers for suppliers and guidance <*http://www.anbp.org*>

Bird Control

Bird-X <*http://www.bird-x.com*>

Drain Cleaners

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

Biostim Inc. <*http://www.biostim.com*>

Door Sweeps, Weather Stripping and Sealants

Aubuchon Hardware <*http://www.aubuchonhardware.com*>

SealEze <*http://www.sealeze.com*>

Grainger <*http://www.grainger.com*>

Pest Monitors, Traps, and Inspection Tools

Atlantic Paste & Glue, Inc. <*http://www.catchmaster.com*>

Biocontrol Network <http://www.biconet.com>

Do-it-yourself Pest Control <*http://www.doyourownpestcontrol.com*>

Gempler's <*http://www.gemplers.com*>

Residex <*http://www.residex.com*>

Victor <*http://www.victorpest.com/*>

References and Websites

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

California Department of Pesticide Regulation. **IPM for Schools video series** (https://www.youtube.com/playlist?list=PLgU4sA8HrUfrRUcWSr1ZcXrZL9zXsrJ0e)

City of Seattle. 2004. **Landscape and Grounds Management Guidelines.** (Available at http://www.seattle.gov/Documents/Departments/OSE/landscape.pdf)

Dreistadt, S.H. 2016. **Pests of Landscape Trees and Shrubs, 3rd. ed.** 437 pp. University of California Division of Agriculture and Natural Resources. Publication No. 3359. $37 (Order it at: http://anrcatalog.ucanr.edu/Details.aspx?itemNo=3359)

EPA. 1993. **Managing Pests in Schools.** US Environmental Protection Agency. Washington, D.C. (https://www.epa.gov/managing-pests-schools.)

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. ($118).

IPM Institute of N.A. 2003. **IPM Standards for Schools** (Available at http://ipminstitute.org/pdf/ISS%20V3.1%20060603.pdf>)

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

University of Florida **National School IPM Information Source.** (<http://schoolipm.ifas.ufl.edu/>).

Maine Department of Agriculture, Conservation and Forestry. **Maine School IPM Program.** 207-287-2731 <http://www.maine.gov/schoolipm>.

Maryland Department of Agriculture. 1995 (revised 2006). **Guidelines for Integrated Pest Management (IPM) in Schools.** 14 pp. (Available at <http://mda.maryland.gov/plants-pests/Documents/ipmguide.pdf >).

Midwest Pesticide Action Center. **Resource Guide for Integrated Pest Management in Schools/Daycare**s. (http://midwestpesticideaction.org/wp-content/uploads/2013/10/MPAC-Resource-Guide-for-IPM-in-Schools-and-Childcares.pdf).

National Clearing House for Educational Facilities. (< http://www.ncef.org/>).

Olkowski, W., S. Daar, and H. Olkowski. 1991. **Common-Sense Pest Control: Least-Toxic Solutions for your Home, Garden, Pets and Community.** Taunton Press, Newtown CT. 715 pp.

PennState Extension. **Pennsylvania School IPM**. (<http://extension.psu.edu/pests/ipm/schools-childcare/schools /).

Sachs, P. 2004. **Managing Healthy Sports Fields**. John Wiley & Sons, Hoboken, NJ. 244 pp.

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

Cornell University New York State IPM. **Resources for Schools and Daycare Centers**. (<https://nysipm.cornell.edu/community/schools-and-daycare-centers>).

Texas A&M AgriLife Extension. **Integrated Pest Management in Schools.** ((<http://schoolipm.tamu.edu/ >).

University of California Statewide IPM Project. **Home, Garden, Turf, and Landscape Pests.** <http://www.ipm.ucdavis.edu/PMG/menu.homegarden.html>).

University of Maine Cooperative Extension. **Pest Management Office**. 207-581-3880, 1-800-287-0279 (in Maine). (<https://extension.umaine.edu/ipm/>)

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. (<https://extension.tennessee.edu/publications/Documents/pb1603.pdf>)

Classroom Resources for Teaching about Insects and Integrated Pest Management (IPM)

Lessons, Games and Other Teaching Tools

Maine School IPM Program. Download free lessons, assessments, activities and more. www.maine.gov/ipm (click on Teacher Resources).

Teach ME Food and Farms. Lessons and resources aligned with Maine Learning Results and Common Core Standards. http://teachmefoodandfarms.org/

Environmental Protection Agency teacher resources for environmental education including IPM Free resources such as games, lessons, and more: https://www.epa.gov/students

IPM in Schools Activity Book. Purdue University Cooperative Extension. 20 pp. Download this at: http://www.entm.purdue.edu/entomology/outreach/schoolipm/pdfs/Act_book.pdf

IPM Super Sleuth Game: http://eric.ed.gov/?id=ED471143

Backyard Pest Patrol Activity Guide. Pennsylvania IPM Program. http://extension.psu.edu/pests/ipm/schools-childcare/schools/kids/brochures/pestpatrol/pestpatrol

University of Illinois on-line narrated self-study lesson about insects. http://extension.illinois.edu/insects/01.html

Pest Private Eye Game and other resources, University of Nebraska: http://pested.unl.edu/pestpi

Programs and Events

Bug Maine-ia. All day educational event held annually in September at the Maine State Museum in Augusta, ME. http://www.mainestatemuseum.org/learn/bug_maine-ia_and_maine_earth_science_day/. 207-287-6608.

Edith Patch Center for Entomology, the Environment and Education, Orono. Educational programming and resources to teach about insects and the environment. www.edithmarionpatch.wordpress.com. Contact edithmarionpatch@yahoo.com.

Maine Agriculture in the Classroom program. Grants, lessons, and teacher training. http://www.agclassroom.org/me/ maitca@maine.gov.

Maine Entomological Society. www.colby.edu/MES. Offers field trips (open to everyone, non-members welcome).

Maine School Gardens Network. www.msgn.org. E-mail: info@msgn.org

University of Maine Cooperative Extension Pest Management Office. 1-800-287-0279. http://extension.umaine.edu/ipm/. Offers insect identification help and more.

Additional Resources for Pest Prevention and Management

Maine School Integrated Pest Management Program. Resources for pest prevention and management in school greenhouses, gardens, buildings and sports fields. www.maine.gov /schoolipm 207-287-7616.

US EPA Managing Pests in Schools. Information and resources, webinars, fact sheets, checklists. https://www.epa.gov/managing-pests-schools

iSchool Pest Manager. Resources and training modules for schools. http://ischoolpestmanager.org/.

IPM Institute of North America. School IPM standards, checklists, and comprehensive resource listing at http://ipminstitute.org/school-ipm-directory/

What's that Bug? Websites for Insect, Plant and Spider Identification and Information

www.gotpests.org

www.bugguide.net

www.insectidentification.org

www.maine.gov/dacf/mfs/forest_health/index.htm

www.maine.gov/agriculture/pi/pestsurvey/pestinfo/index.htm

www.bugwood.org/

www.invasive.org

Maine School Integrated Pest Management Program
Maine Department of Agriculture, Conservation and Forestry
28 State House Station, Augusta, ME 04333
207-287-7616
www.maine.gov/ipm

Why Teach IPM?

Engage your students in learning about their natural world! IPM encourages environmentally friendly methods of managing pests, an issue that is relevant and current.

- Includes basic science learning that connects K-12 students to the real world
- Covers topics such as invasive species, food webs, and school gardens.
- Teaches problem solving and critical thinking skills while demonstrating how human actions have impacts on the environment
- Provides practical knowledge that students and teachers can use in school gardens, greenhouses, agricultural/ horticultural programs, vocational/technical education programs, and in their own homes
- IPM will help the next generation of earth's stewards attain safer, long term solutions to common pest issues.

According to the EPA, people use about 5.1 billion pounds of pesticides each year. Traditional, pesticide-based pest control approaches threaten human health and cause environmental disruption. The next generation of earth's citizens must be informed about sustainable, least-risk pest management practices to protect our food and fiber supply, safeguard the environment and promote human health.

For More Information:

For Lessons, Teaching Resources, and Activities, Visit
www.gotpests.org
Click on the blue Teachers' Box

Find Curricula and Other Resources at
www.northeastipm.org/
Click on IPM Resources

United States Department of Food and Agriculture

Northeastern IPM Center

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Photo credits: Tom Coleman, Bugwood.org; Paul Bolstad, Bugwood.org; advocatesforhealthinaction.com; Close to Home, Dec 8, 2011

Are you teaching your students about…

Ecology?

Insects?

School Gardens?

Let Izzy the Praying Mantis Help!

What is IPM?

IPM, or **Integrated Pest Management**, is not a product but a strategy and decision-making process that manages pests while safeguarding people, pets, and the environment. It joins common-sense practices with knowledge of pest biology to create an effective approach to pest management. When we understand the relationships within an ecosystem, we can be better stewards of the land. IPM is a great way to use our natural resources more sustainably.

Effective use of IPM requires that we learn a bit about why nature sometimes becomes a pest. When is a plant considered a weed? Why do carpenter ants play an important role in maintaining forests, but are feared pests in our homes? Armed with a basic understanding of pest biology and ecology, we can keep pests from causing us harm without disrupting the natural environment. When we learn the conditions leading to pest problems, we can often eliminate pests simply by changing those conditions.

IPM Methods Include:

Biological Control – utilizing a pest's natural enemies: predators and parasites

Mechanical/Physical Control – using traps, barriers, fly swatters, change of temperature, or other physical means

Cultural Control – changing the pests' environment to limit its access to food, water, or shelter

Chemical Control – using the least toxic product; it is used as a last resort in IPM

We are online! Find hundreds of **free** IPM lessons on our website available for download. They are **easy to use** and many have supplemental materials.

Visit our School IPM Curricula Page:

www.gotpests.org
Click on the blue Teachers' Box.

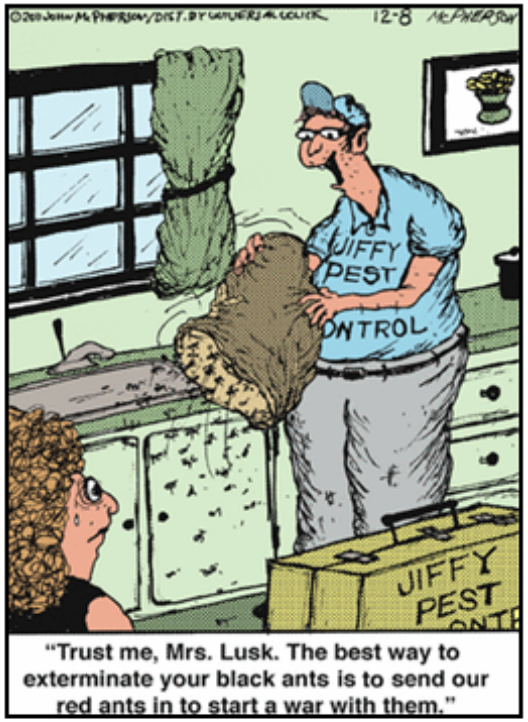
Or **www.maine.gov/ipm**
Click on "Classroom Resources"

Find us on Facebook!

"No More Pests! IPM for Teachers and Kids."
www.tinyurl.com/7wlsazo

IPM Curriculum Offers...

- Hands-on science learning
- Engaging, relevant activities that teach IPM concepts
- Environmental stewardship education
- Critical thinking and problem-solving skills
- Inquiry-based lessons
- Lessons for all grades K-12



"Trust me, Mrs. Lusk. The best way to exterminate your black ants is to send our red ants in to start a war with them."

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
extension.andsag@maine.edu

Aroostook
34 Armory Road, Suite 101
Fort Kent, ME 04743-7131
Phone: (207) 834-3905
or 1-800-287-1421 (in Maine)
FAX: (207) 834-3906
extension.northa@maine.edu

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

25 School St., Suite 210
Houlton, ME 04730-0008
Phone: (207) 532-6548
or 1-800-287-1469 (in Maine)
FAX: (207) 532-6549
extension.southa@maine.edu

Cumberland
UMaine Regional Learning Center,
75 Clearwater Drive, Suite 104, Falmouth, ME 04105
Phone: (207) 781-6099
or 1-800-287-1471 (in Maine)
FAX: (207) 780-4382
extension.cumberland@maine.edu

Franklin
138 Pleasant Street, Suite #1,
Farmington, ME 04938-6403
Phone: (207)778-4650
or 1-800-287-1478 (in Maine)
FAX: (207)778-3982
or 1-800-287-1478 (in Maine)
extension.franklin@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
extension.hancock@maine.edu

Kennebec
125 State Street, 3rd Floor
Augusta, ME 04330-5692
Phone: (207) 622-7546
or 1-800-287-1481 (in Maine)
FAX: (207) 621-4919
extension.kennebec@maine.edu

Knox and Lincoln
377 Manktown Road
Waldoboro, ME 04572
(207) 832-0343
or 1-800-244-2104 (in Maine)
FAX: (207) 832-0377
extension.knoxlincoln@maine.edu

Oxford
9 Olson Road,
South Paris, ME 04281-6402
Phone: (207) 743-6329
or 1-800-287-1482 (in Maine)
FAX: (207) 743-0373
extension.oxford@maine.edu

Penobscot
307 Maine Ave.,
Bangor, ME 04401-4331
Phone: (207) 942-7396
or (800) 287-1485 (in Maine)
FAX: (207) 942-7537
extension.penobscot@maine.edu

Piscataquis
Court House Complex,
165 East Main St.,
Dover-Foxcroft, ME 04426
Phone: (207) 564-3301
or 1-800-287-1491 (in Maine)
FAX: (207) 564-3302
extension.piscataquis@maine.edu

Somerset
7 County Drive,
Skowhegan, ME 04976-4209
Phone: (207) 474-9622
or 1-800-287-1495 (in Maine)
FAX: (207) 474-0374
extension.somerset@maine.edu

Waldo
992 Waterville Road,
Waldo, ME 04915-3117
Phone: (207) 342-5971
or 1-800-287-1426 (in Maine)
FAX: (207) 342-4229
extension.waldo@maine.edu

Washington
34 Center Street
Machias, ME 04654
Phone: (207) 255-3345
or 1-800-287-1542 (in Maine)
extension.washington@maine.edu

York
21 Bradeen St., Suite 302
Springvale, ME 04083
Phone: (207) 324-2814
or 1-800-287-1535 (in Maine)
FAX: (207) 324-0817
extension.york@maine.edu

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