IPM Standards for Schools
Tactics and Resources for Reducing Pest and Pesticide Risks in Schools and Other Sensitive Environments

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Version 3.2 is available in html and PDF format from the IPM Institute’s Web site. Version 3.2 includes minor updates to web site urls that have changed since Version 3.1 was released in June of 2003. Version 3.0 had been revised to become a companion document to the IPM STAR® certification program. Your comments and suggestions are welcome.

About the IPM Institute

The IPM Institute of North America, Inc. is a non-profit membership organization formed in 1998. The Institute’s mission is to accelerate adoption of IPM in agriculture and communities through consumer education and development of IPM standards for self-evaluation and IPM certification. The Institute’s Board of Directors includes IPM experts from Land-Grant Universities and representatives from industry and environmental organizations. To join the Institute, please visit our Web site at http://www.ipminstitute.org or contact us at the address below.

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by the IPM Institute of North America, Inc.
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Dedicated to Ronald J. Prokopy who is responsible for my IPM foundation. – The Editor
Introduction

Integrated Pest Management (IPM) maintains a high standard of pest control while reducing reliance on pesticides. IPM includes:

- regular monitoring to detect problems early;
- acting against pests only when necessary;
- choosing the most effective option with the least risk to people and the environment; and
- applying biological knowledge about pests to create long-term solutions.

Routine pesticide applications, made on a regular calendar-based schedule, are not part of IPM. Allowing pests to flourish, increasing health risks to building occupants and others, is also not part of IPM.

Why IPM in Schools?

By improving pest control, reducing reliance on pesticides and incorporating least-risk control options, IPM reduces both pest and pesticide risks. Using IPM in the school environment is especially important. Children spend a great deal of time in schools and face greater potential for health effects resulting from pest and pesticide exposure. By reducing risks, IPM can also reduce potential liability to school systems from accidental poisoning, allergies or other harmful effects of pests and pesticides on children and adults.

Depending on your school system’s current practices, IPM has 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 achieving excellent pest control.

Finally, IPM has a critical role to play in agriculture, our homes and throughout our communities. Schools adopting IPM set an important example and can be instrumental in teaching staff, students and parents about the practice and benefits of IPM.

Children Face Greater Risks from Pests and Pesticides

“Pound for pound of body weight, children not only breathe more, eat more, and have a more rapid metabolism than adults, but they also play on the floor and lawn where pesticides are commonly applied. Children have more frequent hand-to-mouth contact as well. Children generally are more susceptible than adults to environmental toxics because they are growing and developing. Also, their enzymatic, metabolic and immune systems are immature, allowing in some cases for less natural protection than that of adults.”


“…pests are more than a nuisance. They can pose a serious health threat to young children who are unaware of the danger. Consider these statistics:

- Rats bite more than 45,000 people annually, mostly infants and children.
- Seven to 8 percent of the U.S. population is allergic to cockroaches. Studies of inner-city children in Atlanta with chronic wheezing, runny eyes and noses revealed that 44 percent were allergic to cockroaches.
- Rodents are responsible for, or implicated in, the spread of numerous diseases, including hantavirus, plague, acute food poisoning, rat-bite fever and typhus.
- Lyme disease, transmitted to humans by the deer tick, infects thousands of Americans annually — and the numbers are rising.
- Cockroaches transmit a variety of digestive tract disorders, including food poisoning, dysentery and diarrhea.
- Mosquitoes are prime carriers of several types of encephalitis, a devastating illness that attacks the central nervous system of humans.”

- Excerpt from “Why Children are Especially at Risk,” Responsible Industry for a Sound Environment
**IPM Standards for Schools**

How do you know if the pest management practices in your school are the least risk, most effective available? Are you doing as much as possible to prevent and avoid pest problems? How many of the available IPM practices is your school implementing? *IPM Standards for Schools* serve as checklists of IPM practices for school buildings and grounds. Use them to help you answer these questions.

In agriculture, the use of IPM checklists is increasing. Farmers using IPM checklists are implementing a greater number of IPM practices than non-participants. *IPM Standards for Schools* have the same potential for increasing both the number of schools implementing IPM and the level of IPM practiced.

These IPM standards for schools are designed to function as a:

1. **Learning Tool.** Review *IPM Standards* to learn about the many options available to you. Follow up by reviewing the references listed and discussing practices appropriate for your school with your IPM committee, professional pest control provider, in-house professional pest control staff, administration and interested parents and teachers.

2. **Self-Evaluation and IPM Planning Tool.** Use the Standards to score your school. What additional IPM practices can you implement to improve your performance over the next year? The next three years? Use the practices you have identified as priorities to justify pest control budget requests.

3. **Become Certified as an IPM STAR School.** By meeting certain minimum requirements, your school can become certified as an IPM STAR school by the IPM Institute. Learn more about the IPM STAR certification program and process at [http://www.ipminstitute.org/ipmstar.htm](http://www.ipminstitute.org/ipmstar.htm).

**IPM STAR Certification for Schools**

By implementing IPM, your school can improve pest management results and reduce liability and risks from both pests and pesticides. Certification clearly establishes your school’s IPM achievement in a way that is readily recognized by others both in and outside of your community.

By working towards and achieving IPM STAR Certification, your school will:

- establish a formal schedule for IPM evaluation, planning and training including site visits and comprehensive program review by a qualified outside IPM professional every three years;
- receive regular feedback on your IPM program from a school IPM professional;
- build a professional image and create goodwill with staff, parents and other community members;
- create an ongoing focus on pest and pesticide risk reduction, ensuring that your school continues to meet the highest standards for effective, reduced-risk pest management; and
- access a package of professionally prepared materials, including a brochure, certificate and window stickers to communicate your accomplishment.

Your school can use these materials to inform parents, teachers, students and others in the community about your IPM program, saving time for busy school professionals, reducing costs and duplication of effort, and facilitating clear and accurate transfer of information.

Certification may also exempt schools from certain legislative mandates or administrative requirements, as a clear demonstration that your school has an effective, state-or-the-art IPM program in place.

Implementing IPM can involve startup costs for training and pest preventative measures to improve sanitation or exclude pests. Although these measures can reduce costs over the long term, these
expenses may exceed a school's available budget for pest control in the first years. The IPM Institute is working to recruit community members interested in promoting IPM to provide funding for these IPM startup costs. See the IPM STAR's website at http://www.ipminstitute.org/ipmstar.htm for more information.

Any school may use these IPM Standards to assist in developing and maintaining an IPM program. Certification is a voluntary step for schools or school systems.

**Becoming an IPM STAR Certified School**

To become an IPM STAR Certified School or Daycare Facility, you must contact the IPM Institute to set up an on-site evaluation. IPM STAR certification is effective for three years. After three years, your certification can be renewed by updating the application and evaluation. IPM STAR certification is also available for school and private IPM professionals working in your school. See the IPM Institute website, [http://www.ipminstitute.org](http://www.ipminstitute.org) or contact the Institute for further details.

**Other Sensitive Environments**

Many of the IPM practices listed in the *IPM Standards for Schools* can also be implemented in other sensitive environments, including day cares, nurseries, pre-schools, hospitals and nursing homes.

Many of the resources listed throughout are also useful for professionals working in these other environments. We welcome your comments on the need for Standards for these other environments, and are willing to work with you to adapt the *IPM Standards for Schools* for your industry.

**Join the IPM Institute!**

Any individual or organization can support the work of the IPM Institute by becoming a member. Members enjoy a periodic newsletter with information about IPM, certified institutions and businesses, and the knowledge that they are supporting the growth and development of IPM certification programs in schools, communities and agriculture. Join by signing on to our Web site, or by mail, phone, fax or e-mail (see contact information below).

**School IPM Success Stories**

The New York City Board of Education, representing approximately 1200 school buildings, has eliminated indoor dust formulations of every kind to reduce airborne particulates, eliminated all "pelleted" rodenticides to reduce possibility of translocation, eliminated outside rodenticide baitsets opting to bait and close existing burrows only, increased reliance on glue board monitoring as both indicator and precursory control agents, and reduced the use of one class of pesticides from 918 to 22 lbs. per year. Since 1988, the school system has used over 8000 tubes of sealing silicone glue to close potential pest entries. As of the September 2001 school opening, the New York City Board of Education has totally eliminated the use of carbamates, organo-phosphates, pyrethroids, and even pyrethrin treatments anywhere in their buildings. Also, they still use no aerosols of any kind in classrooms and use no dust products whatsoever anywhere in their schools.

A demonstration project at two public schools in Santa Barbara County CA reduced the costs by 30%, and improved effectiveness of the pest control program. More information available from 930 Miramonte Drive, Santa Barbara, CA 93109, Phone: (805) 963-0583, Fax: (805) 962-9080, Email: cecadmin@cecmail.org.

The Monroe County School Corporation, Monroe County IN, implemented a pilot IPM program that eliminated 90% of pesticide applications in three elementary schools. More at [http://www.epa.gov/oppbppd1/PESP/strategies/2004/mccsc04.htm](http://www.epa.gov/oppbppd1/PESP/strategies/2004/mccsc04.htm).

Your school can become an IPM success story too!
Resources for Starting an IPM Program at your School

These IPM Standards are intended as a guide to IPM practices available to schools. To implement these practices, you will need resources such as professional Pest Managers with a successful track record implementing IPM, Cooperative Extension personnel and information, environmental and public interest organizations active in school pest management and a broad selection of print or Web-based resources, including those listed throughout these IPM Standards for Schools.

Resources developed by Extension and others in your state and region are especially important, as these will include information specific to your region (e.g., laws, regulations, region-specific pest issues).

Resources for Starting Your IPM Program:

Boise, P., and K. Feeney, 1999. Reducing Pesticides in Schools: How Two Elementary Schools Control Common Pests Using Integrated Pest Management Strategies. S. Wright, ed. Community Environmental Council, Santa Barbara, CA. To request a copy, contact 930 Miramonte Drive, Santa Barbara, CA 93109, Phone: (805) 963-0583, Fax: (805) 962-9080, Email: cecadmin@cecmail.org.

Building Blocks for School IPM. 2002. Crouse, Becky, Ed.; Owens, Kagan, Ed. (Beyond Pesticides, Washington, DC) The manual provides comprehensive information on implementing school IPM, including a practical guide to identifying, preventing, and controlling common school pest problems. It is designed for individuals who are responsible for school pest management. It includes information on why schools should adopt IPM programs, how to develop and implement a program, pest management strategies for structural pests, school IPM experts, a model policy and contract, a non- and least-toxic product guide, and fact sheets on the toxicity of commonly used pesticides in schools. 287p. Contact Beyond Pesticides at National Coalition Against the Misuse of Pesticides, 701 E Street, SE, Suite 200, Washington, DC, 20003, Phone: 202-543-5450, Email: info@beyondpesticides.org.


Hollingsworth. 2000. Integrated Pest Management Guidelines for Structural Pests: Model Guidelines for Training and Implementation. Developed by the Structural Working Group of the Massachusetts IPM Council. Provides a systematic strategy for addressing specific structural pest situations. Serves as an educational tool for pest control professionals, building managers and homeowners who wish to practice integrated pest management. Specific pests include ants, bedbugs, cockroaches, fleas, flies, rodents, subterranean termites and more. Also includes a list of pest information Web sites. 58 pages. Contact UMass Extension Bookstore, Draper Hall, 4 Campus Center Way, Amherst, MA 01003-9244; phone (413) 545-5539; fax (413) 545-5174; email nates@umext.umass.edu.

Koehler, et al., 1999. School IPM Web Site. University of Florida. The national Web site for IPM in schools, including how to get started for parents, administration, faculty/staff, and pest managers. Technical information about school IPM, downloadable presentations in html, Acrobat and Powerpoint formats; and links to web sites for state-specific resources. IPM teaching curricula, general IPM, pest control and identification, pesticides and health, State Departments of Education and Health, national and state pest control associations, and fun WWW sites related to school IPM. Available at http://schoolipm.ifas.ufl.edu/.

Join the School IPM E-Mail List

Post your questions to a forum of school IPM professionals from around the country. Read questions and responses from school administrators, Extension specialists, pest management professionals and others working to reduce pest and pesticide risks in schools. The list is open for membership to any person interested in IPM in schools and wishes to discuss this subject with others on the list.

To subscribe, send an e-mail to listserv@lists.ufl.edu. Leave the subject line blank and in the text of the message type the following:

subscribe Schoolbugs-L Your Name

Replace Your Name with your own name. When you subscribe, you will be e-mailed a list of instructions on how to use the list. For more information, visit the Web Site at http://schoolipm.ifas.ufl.edu/listsrvr.htm.


Hollingsworth. 2000. Integrated Pest Management Guidelines for Structural Pests: Model Guidelines for Training and Implementation. Developed by the Structural Working Group of the Massachusetts IPM Council. Provides a systematic strategy for addressing specific structural pest situations. Serves as an educational tool for pest control professionals, building managers and homeowners who wish to practice integrated pest management. Specific pests include ants, bedbugs, cockroaches, fleas, flies, rodents, subterranean termites and more. Also includes a list of pest information Web sites. 58 pages. Contact UMass Extension Bookstore, Draper Hall, 4 Campus Center Way, Amherst, MA 01003-9244; phone (413) 545-5539; fax (413) 545-5174; email nates@umext.umass.edu.

Koehler, et al., 1999. School IPM Web Site. University of Florida. The national Web site for IPM in schools, including how to get started for parents, administration, faculty/staff, and pest managers. Technical information about school IPM, downloadable presentations in html, Acrobat and Powerpoint formats; and links to web sites for state-specific resources. IPM teaching curricula, general IPM, pest control and identification, pesticides and health, State Departments of Education and Health, national and state pest control associations, and fun WWW sites related to school IPM. Available at http://schoolipm.ifas.ufl.edu/.
Integrated Pest Management Policy Statement for Maine Schools. 2-page document includes thoughts on IPM techniques, pest management objectives, the IPM coordinator, record keeping, notification and posting, pesticide storage and purchase and pesticide applicators. Available in Word or PDF format at http://www.state.me.us/agriculture/pesticides/schoolipm/.


Natural Resource, Agriculture, and Engineering Service (NRAES), 2002. Integrated Pest Management for Northeast Schools. Introduction that answers the questions What is IPM? and Why Practice IPM in Schools?; Chapter on the Components of an IPM Program; Chapter on Establishing an IPM Program in Your School; Chapter on Managing Pests Found in Northeast Schools including a detailed list of common pests. Also includes appendices on School IPM Checklist, Examples of Action Thresholds and General Recommendations for Pesticide Applications. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


Pennsylvania IPM Program. 2004. Pennsylvania School IPM Manual. New edition of the manual contains sections on mosquito and tick IPM as well as more references and information on new IPM legislation. The manual also includes chapters on suggestions for setting up an IPM program in schools and developing an IPM policy and a sample policy from the Pennsylvania School Boards Association. Additionally, the manual contains a listing of commonly encountered pests in and around schools as well as information on the biology, identification and management of various types of pests. Available for purchase through the Publications Distribution Center, Penn State University, 112 Agricultural Administration Bldg., University Park, PA. Call (877) 345-0691 (toll free) to order by phone.

Purdue University. 2003. Offering Sound Pest Management Advice to the Public. (PPP-62). 40-page softcover book offers sound and simple advice targeted at retailers (pesticide consultants according to Indiana law) and others who sell pesticides and offer pesticide advice. Covers topics such as Customer Needs, Pest Identifications, Buying Pesticides, Caring for Pesticides at Home, Following Labels, Safety Equipment, Container Disposal, Spills, Hiring a Professional, and web resources. Available to be downloaded for free at http://www.btny.purdue.edu/PPP.

Rutgers Cooperative Extension. 2003. How NY & NJ Schools Can Make the Grade in School IPM. The one-page brochure details how to get started in IPM. Outlines where to get information on national and regional (New York and New Jersey) resources and contacts in School IPM. Available at http://www.pestmanagement.rutgers.edu/IPM/SchoolIPM/brochure.html.

Rutgers Cooperative Extension. 2003. IPM Report Card for School Grounds. These cards provide a series of self-assessment tools that will allow schools to measure their adoption of IPM on school grounds. There are five report cards divided into the following categories: General Requirements, Athletic Fields, Turf, Ornamental Plants and Landscape Plantings. Available at http://www.pestmanagement.rutgers.edu/IPM/SchoolIPM/reportcard.html.

Safer Pest Control Project. IPM Handbook. 38pp. This PDF document includes chapters entitled IPM and notification checklist, summary of state laws requiring IPM and notification, definition of IPM, IPM policy, IPM participants, practicing IPM, and pesticides applications notifications. Available at http://www.spcpweb.org/IPM_handbook.pdf.


University of Florida. 2001. School IPM Model Contract. Extensive outline designed to be used by officials working in schools, such as purchasing agents, who are responsible for procuring pest management services. Available at http://schoolipm.ifas.ufl.edu/doc/model_contract.htm.

Using the IPM Standards for Schools

IPM Standards are included in two parts, one for school buildings and one for school grounds. If your school grounds are managed by a separate department, such as a city or county parks office, please refer the school grounds part to the appropriate personnel. Schools may become IPM certified for their school buildings, school grounds, or both, and on an individual school or system-wide basis.

To help you set priorities for implementing IPM practices, both Buildings and Grounds sections are organized into three Modules:

**MODULE ONE: Building the IPM Foundation**

By completing MODULE ONE, you will be putting your IPM program on a firm foundation:

- meeting all legal requirements;
- identifying resources necessary for an effective IPM program;
- creating an IPM policy, committee and coordinator to guide decision-making;
- setting up basic record keeping;
- establishing community right-to-know; and
- ending routine pesticide applications.

These essential IPM practices are recommended for all school IPM programs and represent an excellent starting point for new programs. Each MODULE ONE practice should be substantially completed before moving on.

**MODULE TWO: Raising the IPM Framework**

MODULE TWO practices build on the foundation by:

- establishing roles and training for key players;
- identifying priorities and creating a pest management plan; and
- limiting pest control actions to effective, reduced-risk options.

**MODULE THREE: Achieving IPM Excellence!**

MODULE THREE practices put your IPM program on the map, systematically addressing administrative and policy as well as pest-specific issues. Implementing practices for the pests you experience problems with at your school will help you manage pests effectively with a minimum of risk. Most schools will need to complete just a few of these sections.

**Calculating Your IPM Score**

The Standards include administrative, policy and pest-specific IPM practices. Each practice is assigned a point value. By implementing a listed practice, you earn the points assigned to the practice.

**Priority Practices** are clearly marked. Priority Practices are required for certification, in addition to all MODULE ONE and TWO practices. Score 80% or more of the points available for each Priority Practice, just as you must for each practice in MODULES ONE and TWO.

**Bonus Practices** are also clearly marked. Points for these practices are not included in the total points available in each section, but if earned, should be added to your score.

**Partial Credit** can be applied to practices that are only partially implemented, or implemented on only a portion of possible sites, occasions, etc. For example, if door sweeps are placed on most but not all doors, partial credit is permitted based on the proportion of doors with sweeps. Obviously, any door without a sweep is a potential pest entry and should be scheduled for correction.
Use partial credit to signal practices that have been implemented but can be improved, and make a note of the improvement needed. For certification purposes, the verifier will determine how many points to apply, and may decline to give any credit for partial completion of a practice that is adversely affecting pest or pesticide risk management in a significant way.

**Reduced-Impact and Least-Impact Pest Control Options** are referred to throughout the Standards. These options are defined in Appendix A. Certified schools may use only materials meeting these definitions. A growing list of these options, including products and trade names, is available at the IPM Institute website.

**Pests or Practices Not Applicable (N/A).** Some sections of the Standards refer to pests that may not be a problem at your school, or may include practices that are not applicable. Mark these sections or practices as N/A (not applicable) and move on. The Scorecard provides a column to note the points available for these sections, and instructs you how to adjust your score for non-applicable sections and practices.

**IPM Scorecards.** By working through the Standards, you accumulate points towards your total score. Use the two IPM Scorecards (one for school buildings and one for school grounds) to calculate your overall score and convert your score to a percentage.

**Glossary.** Unfamiliar terms are defined in Appendix B. When these terms first appear in the text, they appear in *italics*.

**For IPM STAR Certification by the IPM Institute,** review the IPM STAR Certification Program for Schools and Daycare Facilities. An IPM professional will visit your school and evaluate your IPM program and make recommendations for improvement. A satisfactory evaluation will make your school eligible for certification. IPM STAR Certification materials are available at [http://www.ipminstitute.org](http://www.ipminstitute.org) or by contacting the IPM Institute at (608) 232-1528, FAX (608) 232-1530, E-mail ipminstitute@ipminstitute.org.
MODULE ONE: IPM FOUNDATION for School Buildings

Section 1. IPM Planning and Communication

1. Appropriate personnel (e.g., superintendent, facilities manager, principal, \textit{IPM Coordinator}) understand and ensure that the school meets all Federal, State and local legal requirements related to pest management in schools (e.g., posting, notification, pesticide management, etc.). \textit{Legal requirements that exceed or conflict with practices in these Standards supercede those listed here.}

2. Resources are identified and acquired to assist in developing and implementing IPM (e.g., state/county Extension personnel, publications and on-line resources; non-governmental organizations, pest management professionals with expertise in school IPM).

3. A written \textit{IPM policy} is adopted which
   a. states a commitment to IPM implementation;
   b. identifies overall objectives relating to pest and pesticide risk management;
   c. is used to guide decision-making; and
   d. is reviewed at least once every three years and revised as needed.

4. An \textit{IPM Committee} is formed to create and maintain the IPM policy, provide guidance in interpreting the policy, and provide oversight of the program.

5. An \textit{IPM Coordinator} is designated to provide day-to-day oversight of IPM implementation.

6. A plan is developed and implemented to provide necessary IPM training for the IPM Coordinator.

7. \textit{Pest Manager} is aware of and has access to resources to identify key pests.

8. A pesticide notification policy is implemented such that:
   a. At least 24 hours prior to pesticide application, postings are placed in a designated public area detailing locations to be treated and contact information for further information (\textit{exceptions may be made for applications made for emergencies, where an imminent threat to health exists (e.g., stinging insects), or for applications of antimicrobials and for pesticides defined as Least-Risk (Appendix A); for emergency applications, postings must be placed as soon as practical});
   b. this notice remains posted for at least 48 hours post-application; and
c. copies of the pesticide label and MSDS sheet for the material(s) to be used are available on request and maintained on file in a central location (e.g., main office).

9. Complete, legible records of each pesticide application, including product, quantity used, date and time of application, location, application method and target pests are maintained for at least three years.

10. Public access is provided on request to all information about the IPM policy, IPM plan and implementation.

Section 2. Inspection, Sanitation and Exclusion

1. At least a preliminary review of school buildings is conducted to determine nature and extent of pest problems and contributing factors. This information is used to set IPM priorities.

Section 3. Pest and Pesticide Risk Management

1. All pesticide applications are made by a person certified and/or licensed by the state to apply pesticides in commercial facilities.

2. All pesticide applications are made only after detection of a verifiable pest problem and accurate identification of the pest. Applications are not made on a routine or regularly scheduled basis (e.g., weekly, monthly applications are not made).

3. At least a preliminary review of pesticide use practices in school buildings is conducted to evaluate pesticide risks. This information is used to set priorities for reducing or replacing high-risk pesticides and use practices.

Notes:
Resources for IPM Administration and Policy

IPM Planning and Communication


Mertz, et al. Maryland Department of Agriculture, Pesticide Regulation Section publishes report entitled Contracting Guidelines for IPM Services in Maryland Public Schools. Includes an introduction to IPM in schools, general contracting components of IPM in schools, and general information on pest control, program reporting, evaluating and training. Also includes a synopsis of Maryland Pesticide Applicators Law and Regulations. Available in PDF form at http://schoolipm.ifas.ufl.edu/admn_con.htm.


Koehler et al., 1999. School IPM Web Site. University of Florida. Model IPM policy statement; model pest control service contract specifications; model IPM training and workshop agendas; model pest sightings log; model intent to apply pesticides notice; setting action thresholds; links to national and state resources for IPM in schools and IPM-related curricula resources. Available at http://schoolipm.ifas.ufl.edu.


Maine School Integrated Pest Management Program. A Model Integrated Pest Management Policy Statement for Maine Schools. 2-page document includes thoughts on IPM techniques, pest management objectives, the IPM coordinator, record keeping, notification and posting, pesticide storage and purchase and pesticide applicators. Available in Word or PDF format at http://www.state.me.us/agriculture/pesticides/schoolipm.
Maine School IPM Program. Suggested [ pest ] Notification Template. Document in the form of a letter to parent, guardian or staff form the school available with or without registry option for parents. Available in PDF or Word format at http://www.state.me.us/agriculture/pesticides/schoolipm.


Natural Resource, Agriculture, and Engineering Service (NRAES), 2002. Integrated Pest Management for Northeast Schools. Introduction that answers the questions What is IPM? and Why Practice IPM in Schools?; Chapter on the Components of an IPM Program; Chapter on Establishing an IPM Program in Your School; Chapter on Managing Pests Found in Northeast Schools including a detailed list of common pests. Also includes appendices on School IPM Checklist, Examples of Action Thresholds and General Recommendations for Pesticide Application. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


President's Task Force on Environmental Health Risks and Safety Risks to Children. 2003. Inventory of Federal School Environmental Health Activities. Inventory systematically lists all federal agencies’ school environmental health programs. Includes the U.S. Departments of Agriculture, Education, Energy, Health and Human Services, Labor, Interior as well as extensive lists of the U.S. Environmental Protection Agency's current projects and resources. In PDF at http://yosemite.epa.gov/ochp/ochpweb.nsf/content/Inventory.htm/ $file/Inventory.pdf. Also available in HTML version at http://yosemite.epa.gov/ochp/ochpweb.nsf/content/whatwe_tf_proj.htm.


Safer Pest Control Project. 4-page model school pest management policy statement for schools. Available at http://www.spcpweb.org/schpolicy.pdf.

Safer Pest Control Project. Integrated Pest Management in Schools: A Better Method. This 12-minute video is aimed at helping schools, parents, pest control operators, and other groups understand and promote School IPM. Filmed at a Chicago-area school that has practiced IPM since 1994, it features testimony and advice from the school’s pest control operator and operations manager. It addresses concerns about pesticide use, the advantages of practicing IPM, and the basic components of IPM. For more information, see School IPM Video Brochure and Order Form or call Safer Pest Control Project at (312) 641-5575.


"Sustainable Schools Minnesota: High Performance Schools for Higher Performing Students," 2000. LHB Engineers and Architects, Factor 10, LLC, Intep/AW Consulting, and Elk River Area School District. Funded by the MN Office of Environmental Assistance, this free 56-page document is aimed at school board members and other decision-makers involved in the design, construction, and management of schools, and aims to help them with pre-design decisions that can lead to higher performing schools and students. Sections of this report include: Introduction: Schools as Symbols, Highlights of High Performance School Design, Financial Implications of High Performance Schools, Process Overview, Components of High Performance School Design, and Case Examples. Free copies of the report are available from the OEA’s Education Clearinghouse at (651) 215-0232 or (800) 877-6300 or clearinghouse@moea.state.mn.us.

Texas Cooperative Extension. Model IPM Policy Statement. Includes definitions, development of IPM plans, essential IPM principles, pesticides use is school facilities, cooperation with IPM coordinator, contractual agreements with IPM providers, facilities planning, cooperation with regulatory agencies, and licensing and training for pesticide applicators. Available at http://schoolipm.tamu.edu/resources/resources/Technical_Information/model_policy_statement.pdf.

Texas Cooperative Extension. Model Contract Bid Specifications. Model of bid specifications for schools. Includes sections entitled description of services, bid requirements, scope of work, general contractor responsibilities, pest control responsibilities and list of site(s) to be treated. Available at http://schoolipm.tamu.edu/resources/resources/Technical_Information/BIDSPEC2.htm.


US EPA. 2002. EPA Guide to Protecting Children’s Health in Schools. The US EPA has created an online or downloadable guide to identifying potential hazards in schools. The guide includes planning tools, a virtual tour of a school to help identify hazards, a section on case studies as well as a list of resources and contacts. Available at http://www.epa.gov/seahome/child.html.


University of Florida. 2001. School IPM Model Contract. Extensive outline designed to be used by officials working in schools, such as purchasing agents, who are responsible for procuring pest management services. Available at http://schoolipm.ifas.ufl.edu/doc/model_contract.htm.


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**Inspection, Sanitation and Exclusion**


**Pest and Pesticide Risk Management**

American School and University. 1999. "A Bug's Life." Explains the use of integrated pest management (IPM) to help make schools safer and provide a healthier environment for students and staff. Cost considerations when implementing an IPM are discussed as are key factors in establishing a program. Available at http://asumag.com/ar/university_bugs_life/index.htm.

Attorney General of New York, New York State Dept. of Law, and Environmental Protection Bureau. 1996. Pesticides in Schools: Reducing the Risks. Based on concerns that children and staff may be unnecessarily and unwittingly exposed to pesticides in their schools, the New York Attorney General’s Office initiated a state-wide study of pesticide use in New York State in the public schools. This report describes this state-wide survey, provides information about some of the potential dangers of these chemicals, and recommends steps that schools and communities can take to minimize pesticide use. 33p. Available on http://www.oag.state.ny.us/environment/schools96.html.


California State Parent Teacher Association Newsletter. 1998. “Pesticides In Our Schools.” Newsletter discusses use of pesticides on school grounds, parking lots, tracks, play areas, cafeterias, classrooms, gymnasiums and rest rooms, causing acute and chronic health problems.


Cleaning and Maintenance Management Online. 2000. “EPA Encourages Schools to Adopt Pest-Control Option.” The Environmental Protection Agency says school administrators and facility managers who make pest control decisions for school buildings and grounds should become aware of the pest control options available to them. Schools across the nation adopting such programs have reported successful, cost-effective conversion to IPM, which can reduce the use of chemicals and provide economical and effective pest suppression. Available at http://www.facility-maintenance.com/article.asp?IndexID=6630599.


Dahlgren, S. 2000. Athletic Business. “Fowl Play.” Discusses ways some universities have dealt with eliminating insects and wildlife from their athletic fields, the types of problems to look for, the damage pests can cause, the safety issues involved, and tips on remedies are examined. Available at http://www.athleticbusiness.com/articlearchive/content/AB-0100-62.pdf.


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Heathy Schools Network, Inc. 1999. Children, Learning, and Poisons Don't Mix: Kick the Pesticide Habit. This 8-page brochure examines basic information about pesticides and their use in and around schools, how children are exposed to pesticides and their health effects, and how a school can kick the habit of using pesticides. To order, write Healthy Schools Network, Inc., 773 Madison Avenue, Albany, NY 12208; Tel: 518-462-0632, ERIC NO: ED447680.

James, A. 2000. School Planning and Management. "Keep Pests from Becoming a Problem in Your School." Examines the use of pesticides in an integrated pest management (IPM) program. The three steps to creating an IPM are discussed along with IPM personnel communication requirements and the need for written policies managed by a knowledgeable coordinator.

Minnesota Department of Children, Families and Learning. 2000. Web site provides manufacturer name, EPA Toxicity Category and Signal Words for pesticides used in school buildings and grounds; search using EPA registration number, or trade or active ingredient name. Available at http://cfls.state.mn.us/pesticide.


National Environmental Education & Training Foundation. 2003. National Pesticide Competency Guidelines for Medical & Nursing Education and the National Pesticide Practice Skills Guidelines for Medical & Nursing Practice. The National Environmental Education & Training Foundation (NEETF), in partnership with the U.S. Environmental Protection Agency, and in collaboration with the U.S. Department of Health and Human Services, the U.S. Department of Agriculture, and the U.S. Department of Labor, has published guidelines that will serve as tools for focusing schools and practicum programs on pesticide health education, provide guidance directly to nurses and physicians to advance their awareness and skill in recognizing and managing pesticide-related illness, and act as a model for faculty and administrators in integrating specific pesticide issues into education and training. These documents can be viewed and downloaded at http://www.neETF.org/Health/publications.shtml. Paper copies will be available later this year. For more information, contact: The National Environmental Education & Training Foundation, National Strategies for Health Care Providers: Pesticides Initiative; 1707 H Street, NW, Suite 900, Washington, DC, 20006-3915; 202-833-2933 x 535.


Natural Resource, Agriculture, and Engineering Service (NRAES), 2002. Integrated Pest Management for Northeast Schools. Introduction that answers the questions What is IPM? and Why Practice IPM in Schools?; Chapter on the Components of an IPM Program; Chapter on Establishing an IPM Program in Your School; Chapter on Managing Pests Found in Northeast Schools including a detailed list of common pests. Also includes appendices on School IPM Checklist, Examples of Action Thresholds and General Recommendations for Pesticide Applications. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


Northwest Coalition for Alternatives to Pesticides. 2000. Unthinkable Risk: How Children are Exposed and Harmed When Pesticides are Used at School. 50-page report includes a Summary and Introduction; Pesticide Contamination of Indoor Air and Surfaces; Pesticide Contamination of Soil, Vegetation, Tuff, and the Outdoor Environment; Breathing, Touching, Tasting: How Children can Inhale, Absorb, or Ingest Pesticide Residues and Vapors; Learning the Hard Way: Actual School Pesticide Exposure Incidents; Recommendations for Parents, Schools, States, and the Federal Government; References; List of School Pesticide Exposure Incidents; California Incidents; Idaho, Montana, Oregon and Washington Incidents; and Incidents in Other States. Available at http://www.pesticide.org/UnthinkableRisk.html.
Part I. IPM Standards for School Buildings

Pesticide Action Network. 2000. PAN Pesticide Database. Comprehensive online database on the health hazards of more than 5,100 ingredients in pesticides including whether a pesticide is a carcinogen, a reproductive or developmental toxicant or causes other harm to health and which chemicals pollute ground water or kill aquatic wildlife. Sources include the World Health Organization, National Institutes of Health, National Toxicology Program, U.S. Environmental Protection Agency and independent published and peer-reviewed research. Available at http://www.pesticideinfo.org.


United States Poison Control Center Central Hotline. Officials launched the national hotline, 1-800-222-1222, and applauded it as an overdue coordination of the country's 65 separately-run poison centers. Callers dialing the number will be automatically linked to the closest poison center.

United States Senate. 1999. Pesticides: Use, Effects, and Alternatives to Pesticides in Schools. Report to the Ranking Minority Member, Committee on Governmental Affairs. The 18-page report addresses the following questions: 1) what federal requirements govern the use of pesticides in schools? 2) what information exists on the use of pesticides in schools? 3) what data exist on the incidences of short and long term illnesses linked to exposure to pesticides in schools? 4) are the EPA and the states taking actions, where appropriate, to reduce the use of pesticides in schools, and if so, what are the results of these efforts? Available at http://www.gao.gov/archive/2000/rc00017.pdf or, to order a hard copy, contact the U.S. General Accounting Office, P.O. Box 37050, Washington, DC 20013; Tel: 202-512-6000. Report NO: GAO/RCED-00-17.


Evaluating Your Performance

Perfection is an ideal rarely accomplished in the real world. When evaluating your performance on IPM practices listed in these standards, use a critical eye to identify areas for improvement make a note of the action needed. Remember, continuous improvement in reducing pests and pesticide risks is the goal!

Resources for IPM Administration and Policy

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**MODULE TWO: IPM FRAMEWORK for School Buildings**

**Section 1. IPM Planning and Communication**

1. Pest management roles are developed for and communicated at least annually to:
   a) administrators (e.g., principals regarding posting, notification, reporting, etc.);
   b) teachers (e.g., do not bring in/apply pesticides, sanitation, etc.);
   c) custodians (e.g., pest sightings log, inspection, sanitation, exclusion, etc.);
   d) food handlers (e.g., sanitation, exclusion, etc.); and
   e) outside contractors (e.g., IPM policy, posting, pest control options to outside pest management professionals).

2. Pest management roles are developed for and communicated at least on an as needed basis (e.g., headlice incident):
   a) students (e.g., reporting, sanitation, head lice prevention, etc.); and
   b) parents (e.g., no nit policy)

3. A written IPM Plan is prepared that includes a schedule for inspection and monitoring of buildings and adjacent grounds, including a schedule for areas requiring more frequent inspection/monitoring (e.g., food storage, preparation and serving areas).

4. If outside contractors provide pest control services, a written contract is signed identifying specific IPM practices to be used including regular inspections, monitoring where appropriate, record-keeping and agreement to abide by the IPM Policy and IPM Plan, including use of only Reduced-Risk or Least-Risk Options for schools pursuing certification. If outside contractors are not used, score as N/A.

5. A Pest Sightings/Damage Log is kept in a designated area (e.g., main office). Building staff are instructed to report all pest-related incidents to the log including date, time, exact location, a description of the pest or pest damage and the name of the person reporting. Pest Manager reviews reports promptly and records and dates responses taken to each report. This log may be part of a general maintenance reporting system.

6. School notifies all students, staff and others requesting special consideration in the event of a pesticide application:
   a) school provides direct notification to those individuals at least 48 hours in advance of any pesticide application; and
   b) school communicates that this notification option is available to parents and staff at least annually.
Exceptions may be made for applications made where an imminent threat to health exists (e.g., stinging insects), or for applications of pesticides defined as Least-Risk (Appendix A), or for situations where the school will be unoccupied for five days following the application. For emergency applications, postings must be placed as soon as practical.

7. Key staff (e.g., IPM Coordinator, Pest Manager, custodians, food service) participate in IPM training at least annually. Training is adequate and appropriate to the IPM roles fulfilled by these staff members.

Section 2. Inspection, Sanitation and Exclusion

1. A comprehensive inspection of all buildings is conducted by an in-house or contracted professional Pest Manager for defects including cracks, crevices and other pest entryways; food, moisture and shelter resources available to pests; moisture, pest or other damage to structural elements; termite earthen tunnels, pest fecal matter or other signs of pest activity; etc. A report of all defects is prepared, corrective actions are identified.

2. Legible records are maintained of inspection results, pest management actions and evaluations of results and maintained for at least three years.

3. A timeline is established for completion of corrective actions and evaluation of results.

Section 3. Pest and Pesticide Risk Management

1. Pesticide inventories are maintained only if personnel properly licensed to apply those pesticides are on staff. Storage is tightly controlled to prevent unauthorized access. *If pesticide inventories are not maintained by the school, score as N/A.*

2. Baits (e.g., for ants, cockroaches, rodents), if used, are:
   a) placed in areas inaccessible or off-limits to children;
   b) placed in a locked, distinctively marked, tamper-resistant container designed specifically for holding baits and constructed of metal, plastic or wood;
   c) used in bait containers securely attached to floors, walls, etc. such that the container cannot be picked up and moved;
   d) placed in the baffle-protected feeding chamber of the bait container and not in the runway;
   e) parafinized or weatherproof if used in wet areas; and
   f) not used outdoors unless bait containers are inaccessible to children (e.g., placed underground in pest nests or on building roofs).

*If pests are managed effectively without baits, score as N/A.*
3. If dust formulations are used, these are applied only to areas that are 
sealed after treatment (e.g., wall voids) to prevent exposure of students 
to airborne dust particles. If pests are managed effectively without 
dusts, score as N/A.

4. Reduced-Risk or Least-Risk Options are the only methods used.

Note items requiring additional action:

Section 1. IPM Planning and Communication

1. **Priority:** The IPM Plan includes a list of key pests and action thresholds for each key pest (even if threshold is one, i.e., no tolerance).

2. **Priority:** The IPM Plan includes a list of management options to be used when key pest problems occur and specifies lesser risk options (e.g., sanitation, exclusion) to be used before resorting to actions with greater risk factors. (See Appendix A for discussion on risk ranking.)

3. The IPM Plan includes a list of actions to prevent and avoid key pest problems (e.g., building maintenance and repair, waste handling equipment upgrades) and a timeline for implementation.

4. If outside professional pest management contractors are used, bids are evaluated not only on the basis of cost but also on contractor:
   a) experience and performance history with an IPM approach;
   b) ability to conduct preventative inspections;
   c) ability to apply treatments after school hours; and
   d) demonstrated practice of using lowest risk control options first.

*If outside contractors are not used, score as N/A.*

5. The IPM plan specifies policies for new or renovated building design that include opportunities for Pest Manager input regarding preventative and avoidance strategies for pests.

6. School notifies staff and parents at least 48 hours in advance of the application of any pesticide not on the Least-Risk Pest Control Option List. Such notification may be incorporated in any notice being sent to staff or parents meeting the 48-hour advance timing. **Exceptions may be made for applications made for emergencies, where an imminent threat to health exists (e.g., stinging insects). For emergency applications, notification must be made as soon as practical.**

7. **Bonus:** Teachers incorporate school building IPM, or general IPM concepts into curricula and/or class projects.

Section 2. Inspection, Exclusion and Sanitation

1. A written IPM inspection checklist or form is used for periodic inspections, listing each building feature (e.g., foundation, eaves, etc.) and room to be inspected, including specific locations within features or rooms (e.g., vents, storage closets) to be included in the inspection, and specific conditions to be noted (e.g., repair, cleaning needs).

2. Building eaves, walls and roofs are inspected at least quarterly (e.g., for bird and other nests, puddling, etc.) and these conditions are corrected.
3. Vegetation, shrubs and wood mulch are kept ≥ 12 in. away from structures.

4. Tree limbs and branches that might provide vertebrate pest access to structures are maintained at least 6 ft. away from structures (10 ft. if tree squirrels are a problem).

5. Exterior doors throughout the building are kept shut when not in use.

6. Windows and vents are screened or filtered.

7. Weather stripping and door sweeps are placed on doors to exclude pest entry and are maintained in good condition.

8. Cracks and crevices in walls, floors and pavement are corrected.

9. Openings around potential insect and rodent runways (electrical conduits, heating ducts, plumbing pipes) are sealed.

10. Floor drains are screened.

11. Sewer lines are in good repair.

12. Pest Manager inspects all new construction for conditions conducive to pests (e.g., unsealed pipe chases or electrical conduits; potential bird roosts or nesting areas, etc.).

13. Floors are cleaned (free from spillage) and carpets vacuumed daily in areas where food is served, and at least weekly in other areas.

14. Pest management roles communicated to staff and students include removing food or food wrappers from lockers and desks on a daily basis.

15. Lockers and desks are emptied and thoroughly cleaned at least twice per year (e.g., winter break and at the end of each school year).

16. **Bonus:** Lockers and desks are emptied and thoroughly cleaned at least three times per year (e.g., winter and spring breaks and at the end of each school year).

17. Any food items on hand in classrooms (e.g., snack food in kindergartens) at end of year are removed.

18. Students are advised at the start of the school year not to exchange hats, combs or hairbrushes.

19. Incoming shipments of food products, paper supplies, etc. are inspected for pests and rejected if infested.

20. Stored products are rotated on a “first in, first out” basis to reduce potential for pest harborage and reproduction.

21. Inspection aisles (≥ 6” x 6”) are maintained around bulk stored products.
Bulk stored products are not permitted direct contact with walls or floors, allowing access for inspection and reducing pest harborages.

22. 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.

23. Food products not delivered in pest-proof containers (e.g., paper, cardboard boxes) and not used immediately are stored refrigerated or transferred to pest-proof containers.

24. **Bonus**: Empty food/beverage containers to be recycled are washed with soapy water before storage to remove food residue, stored refrigerated or in pest-proof containers.

25. Food-contaminated dishes, utensils, surfaces are cleaned by the end of each day.

26. Wiping cloths are disposable or laundered daily.

27. Mops and mop buckets are properly dried and stored (e.g., mops hung upside down, buckets emptied).

28. Surfaces in food preparation and serving areas are regularly cleaned of any grease deposits.

29. Appliances and furnishings in these areas that are rarely moved (e.g., refrigerators, freezers, shelf units) receive a thorough cleaning around and under to remove accumulated grease, dust, etc., at least monthly.

30. Vending machines are maintained in clean condition inside and out.

31. **Bonus**: Food and beverages are allowed only in limited designated areas.

32. Waste materials in all rooms within the school building are collected and removed to a dumpster, compactor or designated pickup location daily.

33. Packing and shipping trash (bags, boxes, pallets) is promptly and properly disposed of or recycled.

34. Food waste from preparation and serving areas is stored in sealed plastic bags before removal from school grounds.

35. **Bonus**: Waste with liquid food residues (e.g., milk cartons, juice boxes) are drained of excess moisture before discarding.

36. Animal wastes from classroom pets or laboratory animals are flushed or placed in sealed containers before disposal. *If pets and animals are not present, score as N/A.*

37. Trash/recycling rooms, compactors and dumpsters are regularly inspected and spills cleaned up and leaks repaired promptly.
38. Indoor garbage is kept in lined, covered containers and emptied daily.

39. All garbage cans and dumpsters are cleaned regularly.

40. Outdoor garbage containers and storage are placed away from building entrances.

41. Outdoor garbage containers, dumpsters, compactors and storage are placed on hard, cleanable surfaces.

42. Outdoor garbage containers have spring-loaded lids to exclude pests.

43. Stored waste is collected and moved off site at least once weekly.

44. **Bonus:** Stored waste is collected and moved off site at least *twice* weekly.

45. Recyclables are collected and moved off site at least weekly.

46. **Bonus:** Recyclables are collected and moved off site at least *twice* weekly.

47. Floor and sink drain traps are kept full of water.

48. In food service areas, drain covers are removed and drains are cleaned weekly (e.g., with a long-handled brush and cleaning solution).

49. In other areas, such as drains under refrigeration units, drains are cleaned monthly.

50. **Bonus:** Out-of-date charts or paper notices are removed from walls monthly.

51. Furniture in classrooms and offices that are rarely moved (e.g., staff desks, bookcases, filing cabinets) receive a thorough cleaning around and under to remove accumulated lint, etc., at least annually.

52. Vent or heater filters are cleaned or replaced as per manufacturer’s recommended interval or more frequently.

53. **Bonus:** The inside of vents and ducts are inspected at least every three years and cleaned by a certified contractor when needed.

54. Moisture sources are corrected (e.g., ventilate areas where condensation forms frequently, repair plumbing, roof leaks, dripping air conditioners).

55. **Bonus:** Permanent bulletin boards, mirrors and other wall fixtures are caulked.

56. **Bonus:** Trash/recycling storage rooms are refrigerated.

57. **Bonus:** 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).
58. **Bonus:** Purchases of new office and classroom 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.

**Section 3. Pest and Pesticide Risk Management**

1. **Priority:** When pest problems requiring action occur, appropriate lesser risk options are used first.

2. If baits or traps of any kind are used:
   a) a map or floor plan of each area where baits or traps are located is prepared;
   b) each bait station or trap is numbered and entered on the map;
   c) they are marked with appropriate warning language; and
   d) they are checked at least once per month.

   *If pests are managed effectively without baits or traps, score as N/A.*

3. Inventory is managed to track current stock and use and ensure proper disposal of unused materials and empty. *If pesticide inventories are not maintained by the school, score as N/A.*

4. Food that has come in direct contact with pests (e.g., ants, cockroaches, mice) is considered contaminated and is discarded.

5. **Bonus:** Least-Risk Options are the only pest controls used.

6. **Bonus:** No pesticides are stored on school grounds.

7. **Bonus:** No pesticides are applied for pests causing aesthetic damage only.

8. **Bonus:** Teachers incorporate pest and pesticide risk management into curricula and/or class projects.

---

**About MODULE THREE IPM Practices**

Not all MODULE THREE IPM practices are appropriate for all schools. Choose the ones that will be most effective for your IPM program. Most schools will need to complete just a few of the pest-specific sections.
Note items requiring additional action:

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MODULE THREE: Pest-Specific IPM Practices for School Buildings

Section 4. Ants

For Carpenter Ants, see section 16.0; for Fire Ants, see section 14.0.

Common Key Pests in Schools

1. **Priority:** Action thresholds for key ant pests are defined in the IPM Plan and effectively implemented.  
   Points Available: 20

2. When ant problems occur, ants are identified correctly before taking action. Actions are appropriate for the problem ant.  
   Points Available: 20

3. When ant problems occur, contributing factors are identified and corrected (e.g., seal cracks or crevices, resolve sanitation problems).  
   Points Available: 20

4. Pest management roles communicated at least annually to maintenance and food preparation/serving staff include preventative sanitation, prompt reporting of ant problems, and killing or removing lone, wandering ant “scouts” whenever they are spotted in buildings.  
   Points Available: 5

5. Non-bait insecticides are used for ants only at the nest. If ants are managed effectively without non-bait insecticides, score as N/A.  
   Points Available: 10

6. Insecticide baits (If ants are managed effectively without baits, score as N/A):
   a) are used only against species for which baiting has been shown to be effective (e.g., Harvester and Pharaoh Ants; plus Argentine, Big Headed, Ghost, Little Black, Odorous House, Pavement, Pyramid, Small Honey Ants if nests cannot be located; and not Large Yellow Ants; these may change as new baits become available);  
      Points Available: 5
   b) are used only if a thorough inspection is undertaken to ensure that baits are placed along all active trails as close to the nest as possible (including outside the building, inside electrical outlets and fixtures, etc.);  
      Points Available: 5
   c) **Bonus:** are checked for feeding within 48 hours of placement, and replaced with an alternate bait if no feeding activity occurs;  
      Points Available: 5
   d) are replenished as long as feeding activity persists; and  
      Points Available: 5
   e) are used only if ants are denied access to all alternate food sources during baiting programs.  
      Points Available: 5

7. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for ant management.  
   Points Available: 5

8. **Bonus:** Pest Manager can identify pest ants common to the region on sight (e.g., Big-Headed Ant, Argentine Ant, Fire Ant, Odorous House Ant, Pavement Ant, Pharaoh Ant, Thief Ant), and knows their typical nesting sites.  
   Points Available: 10

9. **Bonus:** Teachers incorporate IPM for ants into curricula and/or class projects.  
   Points Available: 10

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10. Least-Risk Options are the only methods used for ant management.

“Proper identification is the most important skill to master, for without the identity of the target ant, one will not know its habits, and therefore, where to look for its nest location. Not locating ant colonies is the primary cause of ant control failures.”
- Excerpt from Hedges 1997

About KEY PESTS

A key pest is one that is usually encountered at unacceptable levels at least once each school year. Geographic region and climate; surrounding landscape features; and type of construction, age and condition of school buildings influence which pests become key pests for your school.

Typical key pests in and around school buildings include ants, birds, cockroaches, head lice, yellowjackets and rodents.

Routine or regularly scheduled pesticide applications can mask key pests, which may not become apparent for some time after routine pesticide applications have been stopped.

For key pests, it makes sense to plan ahead and determine which inspection and monitoring procedures will be used to detect problems early, and how many pests or how much pest damage can be tolerated before taking action.

Resources for Ant Management:


Notes:

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Ants

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## Section 5. Birds

**[ ] NOT APPLICABLE** *(Check here if birds are not a problem requiring action in your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

1. **Priority:** Persons handling bird traps, inspecting bird roosts, cleaning bird mess or removing bird nests are trained in proper hygiene and wear appropriate protective gear.

2. **Priority:** Action thresholds for key bird pests are defined in the IPM Plan and effectively implemented.

3. When bird problems occur, birds are identified correctly before taking action. Actions are appropriate for the problem bird.

4. When bird problems occur, contributing factors are identified and corrected (e.g., roosts on buildings or trees on school grounds are modified with repellant gels, spikes, pruning, etc.).

5. Traps or other surfaces contaminated with bird droppings are properly disinfected or disposed of.

6. Methods that result in harm to birds (toxic baits, lethal traps) are used only by certified applicators and only after non-lethal methods (exclusion, repellants) have been proven ineffective. *If birds are managed effectively with non-harmful methods only, score as N/A.*

7. Pest management roles communicated at least annually to building staff include prompt reporting of bird problems and personal health issues regarding bird droppings.

8. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for problem bird management.

9. Roost modification (e.g., with netting, sticky gels, wire, spikes, tree pruning, nest removal, etc.) is undertaken prior to or after nesting season, unless there is an immediate health concern (e.g., nesting in or near vents, accumulation of fecal matter).

10. Roosting surfaces to be modified are thoroughly cleaned prior to application of netting, gels, wires or spikes.

11. **Bonus:** Pest Manager can identify problem birds commonly found in the region on sight (e.g., geese, gulls, pigeons, sparrows, starlings, woodpeckers).

12. **Bonus:** Teachers incorporate IPM for problem birds into curricula and/or class projects.

13. Least-Risk Options are the only methods used for problem bird management.
Resources for Bird Management:


Notes:
### Section 6. Cockroaches

[ ] **NOT APPLICABLE** *(Check here if cockroaches are not a problem requiring action in your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Common Key Pests in Schools</th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority: Action thresholds for key cockroach pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>2. When cockroach problems occur, the problem cockroach is identified before taking action. Actions are appropriate for the problem cockroach.</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>3. When cockroach problems occur, contributing factors are identified and corrected (e.g., seal cracks or crevices, drill and treat hollow walls).</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>4. <strong>Priority:</strong> An inspection/monitoring program for cockroaches is specified in the IPM Plan and implemented to detect problems early and indicate cockroach movement patterns and potential infestation sources.</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>5. If non-bait insecticide applications are used, insecticides are not permitted to come in contact with monitoring traps or surfaces near traps. <em>If cockroaches are managed effectively without non-bait insecticides, score as N/A.</em></td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>6. Pest management roles communicated at least annually to maintenance and food preparation/maintenance staff include preventative sanitation and prompt reporting of cockroach problems.</td>
<td>5</td>
<td>______</td>
</tr>
<tr>
<td>7. Public health officials involved in regulating and inspecting food preparation and serving areas in schools are made aware of the school’s IPM Policy, IPM Plan and cockroach monitoring procedures.</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>8. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for cockroach management.</td>
<td>5</td>
<td>______</td>
</tr>
<tr>
<td>9. <strong>Bonus:</strong> Pest Manager can identify cockroaches common to the region on sight (e.g., American, Australian, Brown-Banded, German, Oriental).</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>10. <strong>Bonus:</strong> Teachers incorporate IPM for cockroaches into curricula and/or class projects.</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>11. Least-Risk Options are the only methods used for cockroach management.</td>
<td>5</td>
<td>______</td>
</tr>
</tbody>
</table>

---

**A Cockroach a Day…**

“In an 1886 issue of the New York Tribune, the curious medical practices in Louisiana were described. These included the prescribing of cockroach tea for tetanus, supplemented by a poultice of boiled roaches over the wound. The Blattaria were also fried in oil with garlic -- a time-honored treatment for indigestion. Years later, the legendary New Orleans jazz singer Louis Armstrong recalled being served a broth made from several boiled roaches, whenever he was ill. Whether this treatment soothed or caused Armstrong’s gravelly voice has yet to be resolved.”

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Resources for Cockroach Management:


Hollingsworth et al., 2002. Cockroaches. Pp. 28-33. In Integrated Pest Management for Northeast Schools. Photos, descriptions and ways in which to inspect, monitor and manage cockroaches in schools. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


CASE STUDY: Cockroaches at Peabody Charter School

"Cockroaches have been a perpetual problem at Peabody Charter School. Teachers reported flicking on the lights at night and having to tiptoe through the swarming insects. To control the roaches, teachers either sprayed with neurotoxic pesticide or stepped on them. Like many old Santa Barbara schools, the problem was one of habitat, not sanitation. Basically, the occupants maintained a very high tolerance for the pests.

Identification: The insect was identified by the Agricultural Commissioner's office as the Oriental Cockroach (Blatta orientalis).

Information: Research indicated the preferred habitat is low, moist, dark areas, and revealed that Oriental roaches do not like to climb. This information alone allowed the IPM team to limit its time and materials to areas of preferred habitat, and prevented unnecessary action in areas of greater human activity, such as countertops.

Observation and Record Keeping: Monitoring traps were placed broadly throughout the building to show areas of high pest activity and direction of travel. This narrowed the treatment area yet further, and prevented unnecessary pesticide applications.

Action: Treatments were made with caulking, low toxicity baits placed in inaccessible areas, and a very light dusting of boric acid in inaccessible voids.

Evaluation and Modification: Continued monitoring aided in refinement of bait station placement. Roach numbers dropped from an average of 8.25 (and a high of 20) per trap before treatment, to an average of 3.3 six weeks after initial treatment. This number dropped even further 12 weeks after treatment to an average 0.5 per trap. Traps were monitored on 14-day cycles, with the number of traps reduced after treatment, based on need. One year after treatment, cockroach populations continue to be suppressed."

- Excerpt from Reducing Pesticides in Schools: How Two Elementary Schools Control Common Pests Using IPM Strategies, To request a copy, contact 930 Miramonte Drive, Santa Barbara, CA 93109, Phone: (805) 963-0583, Fax: (805) 962-9080, Email: cecadmin@cecmail.org

Cockroaches

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Section 7. Fleas

[ ] NOT APPLICABLE (Check here if fleas are not a problem requiring action in your school and proceed to the next section.)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority: Action thresholds for fleas are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When flea problems are confirmed, contributing factors are identified and corrected (e.g., rodent or wildlife problems are resolved, domestic animal access is restricted, classroom pets are checked for fleas).</td>
<td>20</td>
</tr>
<tr>
<td>3. Pest management roles communicated at least annually to school staff working with classroom pets include preventative sanitation and prompt reporting of flea problems.</td>
<td>5</td>
</tr>
<tr>
<td>4. Priority: Reduced-Risk or Least-Risk Options are the only methods used for flea management.</td>
<td>5</td>
</tr>
<tr>
<td>5. When flea problems occur, affected areas are cleared of clutter. These areas are vacuumed daily, with special attention to difficult locations where dust and dirt accumulate that may harbor flea larvae: cracks and crevices, junctions of floor and walls, under furniture, in closets, and window sills and shelves near classroom pets or lab animals. After vacuuming, vacuum bags are sealed and removed from the premises.</td>
<td>5</td>
</tr>
<tr>
<td>6. Bonus: When flea problems persist in buildings, fleas are identified to species to help determine the source of the problem.</td>
<td>10</td>
</tr>
<tr>
<td>7. Bonus: Teachers incorporate IPM for fleas into curricula and/or class projects.</td>
<td>10</td>
</tr>
<tr>
<td>8. Least-Risk Options are the only methods used for flea management.</td>
<td>5</td>
</tr>
</tbody>
</table>
Resources for Flea Management:

Brammer, Angela. 2002. “Pull up your socks, early fall is 'flea season'” Fact Sheets. The University of Florida School IPM website has press releases on fleas (1 page, 2/3 page, 1/3 page) in both HTML and Word formats for available for downloading and using in school district or other newsletters. Contains information on transmission, biology, prevention and management of fleas. Available at http://schoolipm.ifas.ufl.edu/pres_art.htm.


Notes:

So, naturalists observe, a flea
Hath smaller fleas that on him prey;
And these have smaller still to bite ’em;
And so proceed ad infinitum.
Thus every poet in his kind,
Is bit by him that comes behind.

- Jonathan Swift

Fleas

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### Section 8. Flies, Gnats & Midges

<table>
<thead>
<tr>
<th>Priority: Action thresholds for key fly, gnat or midge pests are defined in the IPM Plan and effectively implemented.</th>
<th>Points Available: 20 Points Earned: ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>When fly, gnat or midge problems occur, the problem pest is identified before taking action. Actions are appropriate for the problem pest.</td>
<td>Points Available: 20 Points Earned: ____</td>
</tr>
<tr>
<td>When fly, gnat or midge problems occur, contributing factors are identified and corrected (e.g., repair leaking drains, repair/install screens and vent filters, allow potted plant soil to dry out between waterings for fungus gnats, correct breeding sites for fruit flies, etc.).</td>
<td>Points Available: 20 Points Earned: ____</td>
</tr>
<tr>
<td>Pest management roles communicated at least annually to maintenance and food preparation/serving staff include preventative sanitation and exclusion and prompt reporting of fly, gnat or midge problems.</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>If fly traps are used for monitoring or population suppression (If flies are managed effectively without traps, score as N/A):</td>
<td></td>
</tr>
<tr>
<td>a) these are permitted for use where children are present (check label);</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>b) they are serviced properly (e.g., sticky traps are replaced when dry or fly-covered, ensure baits are not used as fly breeding sites);</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>c) outdoor, baited traps are placed as close to breeding areas as possible; and</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>d) all traps are placed away from building entrances.</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>Public health officials involved in regulating and inspecting food preparation and serving areas in schools are made aware of the schools IPM Policy, IPM Plan and pest fly monitoring procedures.</td>
<td>Points Available: 10 Points Earned: ____</td>
</tr>
<tr>
<td>Fly specks are not allowed to accumulate on walls, windows, ceilings, drains, etc., indoors or out.</td>
<td>Points Available: 10 Points Earned: ____</td>
</tr>
<tr>
<td>Surfaces with fly specks are thoroughly cleaned with water plus detergent to remove any residual odor.</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>Priority: Reduced-Risk or Least-Risk Options are the only methods used for fly, gnat or midge management.</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>Any fruit left unrefrigerated for ripening is placed in container that does not allow fruit fly access (e.g., a paper bag with top sealed by folding and clipping with clothespin or paper clip). If fruit is not left unrefrigerated, score as N/A.</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>Dumpsters or other outside trash storage containers are positioned so as to avoid drawing flies to building entrances.</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
<tr>
<td>Soil around dumpsters or dumpster pads is regularly inspected for liquid-soaked, odorous areas where flies may breed. These areas are scraped and soil collected, sealed in a plastic bag and disposed of.</td>
<td>Points Available: 5 Points Earned: ____</td>
</tr>
</tbody>
</table>
13. Where flies are a persistent problem, frequently used entrances are equipped with vertical plastic strip barriers, fans directing air down and out, or “air walls” that allow human access but prevent fly entry. *If flies are managed effectively without these, score as N/A.*

14. Indoor and outdoor lighting is shielded, of a color less attractive to insects than white, or placed at a sufficient distance from building entrances to avoid drawing flying insects into buildings.

15. **Bonus:** Pest Manager can identify fly, gnat and midge pests common to the region on sight (e.g., blow flies, bottle flies, cluster flies, dump flies, fruit flies, houseflies, phorid flies; fungus gnats).

16. **Bonus:** Teachers incorporate IPM for flies, gnats and midges into curricula and/or class projects.

17. Least-Risk Options are the only methods used for fly, gnat or midge management.

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**Resources for Fly, Gnat and Midge Management:**

Abe, Thomas. 2002. Shockwave program. *This 732 KB program on fly integrated pest management is available for downloading from the web. The program emphasizes the use of insect light traps, but also presents detailed information for pest control managers in the entire area of fly management. The program is written at the level of pest management supervisors and other experts.* Available at the Pest Alert site, http://extlab7.entnem.ufl.edu/PestAlert.


Hollingsworth et al., 2002. Flies. Pp. 34-36. *In Integrated Pest Management for Northeast Schools. Photos, descriptions and ways in which to inspect, monitor and manage flies in schools.* Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


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**Flies, Gnats & Midges**

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Notes:
### Section 9. Head Lice

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priority</strong>: School rooms are never treated with pesticides for head lice.</td>
<td>20 _____</td>
</tr>
<tr>
<td><strong>Priority</strong>: When head lice are detected, all children in the classroom are checked for lice and any students found infested are sent home with a minimum of disruption until free of lice and nits.</td>
<td>10 _____</td>
</tr>
<tr>
<td>Parents of all children in classrooms where lice infestations are found are provided with information on lice detection and treatment.</td>
<td>10 _____</td>
</tr>
<tr>
<td><strong>Priority</strong>: Pest management roles communicated to teaching staff of grades six and below include prompt reporting of head lice infestations and instructing students to avoid head-to-head contact.</td>
<td>10 _____</td>
</tr>
<tr>
<td>An annual head lice check is conducted at the beginning of each school year for students of grades six and below.</td>
<td>10 _____</td>
</tr>
<tr>
<td>Sleeping mats or towels brought by students from home to school are individually labeled and not shared, and sent home regularly for washing. <em>If sleeping mats or towels are not used, score as N/A.</em></td>
<td>10 _____</td>
</tr>
<tr>
<td>Students are provided with a way to store coats, hats and scarves in such a way that they are not in contact with those of other students, e.g., adequately spaced coat hooks, cubbies, or labeled plastic bags.</td>
<td>10 _____</td>
</tr>
<tr>
<td>Communications to parents when head lice are detected caution against:</td>
<td></td>
</tr>
<tr>
<td>a) ineffective and/or dangerous treatments (e.g., pesticide treatment of homes, use of shampoos containing lindane, folk remedies such as gasoline or kerosene treatment of hair);</td>
<td>5 _____</td>
</tr>
<tr>
<td>b) use of over-the-counter or prescription treatments at greater than the recommended dose or frequency;</td>
<td>5 _____</td>
</tr>
<tr>
<td>c) treating children not infested with live head lice or viable eggs; and</td>
<td>5 _____</td>
</tr>
<tr>
<td>d) include information on manual removal of lice and nits.</td>
<td>5 _____</td>
</tr>
<tr>
<td><strong>Bonus</strong>: Teachers incorporate IPM for head lice into curricula and/or class projects.</td>
<td>10 _____</td>
</tr>
<tr>
<td>Information on head lice prevention, detection and reporting and the school’s policy on head lice management is sent home with children at the beginning of each school year.</td>
<td>10 _____</td>
</tr>
</tbody>
</table>

**Resources for Head Lice Management:**


Head Lice


University of Nebraska-Lincoln. 2003. Removing Head Lice Safely Video. 8-minute video covers all aspects of head lice management, highlighting live lice (highly magnified), nits (lice eggs), inspection, treatments and prevention. Each video tape comes with the reproducible fact sheet and quick guides. Available in English, Arabic and Spanish. To request a brochure/order form by mail or fax, or for prices on shipping outside the United States or Canada, call 402-441-7180 or email Lancaster@unl.edu.
Notes:

The No Nit Policy: A Healthy Standard for Children and their Families

“The National Pediculosis Association recommends the No Nit Policy as the public health standard intended to keep children lice free, nit free, and in school. Pediculosis represents one of the most common communicable childhood diseases and whether or not we understand how this has evolved, it is important to acknowledge head lice as a problem when raising or caring for children. We can begin to improve the current situation by assuring that the health programs of every school, camp and child care facility operate with an acceptable head lice management protocol.

The Spirit of the No Nit Policy is to minimize head lice infestations as a public health problem and to keep children in school.

The No Nit Policy encourages each family to do its part at home with routine screening, early detection, accurate identification and thorough removal of lice and nits. Establishing consistent guidelines and educating the public about procedures in advance of outbreaks helps minimize inappropriate responses.

Early intervention provides the needed assurance for those who have successfully eliminated an infestation that everything possible is being done to prevent new outbreaks when children return to groups where close contact is inevitable. Repeated exposures to pesticidal products with each infestation put children at risk. Parents need to be informed that chemical treatments may also be dangerous for children with certain pre-existing medical conditions and/or medication regimens. Families with pregnant or nursing mothers should be given advance notice that early detection with manual removal of lice and nits can serve as a safe alternative to pesticidal lice treatment products.

The No Nit Policy calls for:

1. Community education to help parents understand why there is the No Nit Policy and do what they need to do to carry it out.
2. The exclusion of a child from a school, camp or child care setting until all head lice, lice eggs (nits) and egg cases have been removed.”

- Excerpt from National Pediculosis Web site, more at http://www.headlice.org/
## Section 10. Microbial Pests

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Tasks requiring cleaning are clearly distinguished from disinfecting tasks.</td>
<td>20</td>
</tr>
<tr>
<td>2. <strong>Priority:</strong> Products used for routine cleaning do not contain disinfectants.</td>
<td>20</td>
</tr>
<tr>
<td>3. <strong>Priority:</strong> When use of a disinfectant is appropriate, the product is used according to all label regulations and instructions.</td>
<td>20</td>
</tr>
<tr>
<td>4. <strong>Priority:</strong> Staff who use cleaning and disinfecting products are adequately trained in appropriate use.</td>
<td>20</td>
</tr>
<tr>
<td>5. <strong>Priority:</strong> Cleaning and disinfecting products are stored in secure areas inaccessible to children</td>
<td>20</td>
</tr>
<tr>
<td>6. Custodial cleaning and disinfectant products are evaluated and selected on the basis of environmental and public health criteria related to their active ingredients, as well as performance and cost.</td>
<td>5</td>
</tr>
<tr>
<td>7. Custodial product suppliers are required to submit information on inert ingredients in addition to active ingredients and this information is used in the evaluation process.</td>
<td>5</td>
</tr>
<tr>
<td>8. Custodial product suppliers are required to certify that no ingredients are used which require reporting under the US EPA’s Superfund Amendments and Re-authorization Act (floor care products and metal polishes may be exempted from this requirement).</td>
<td>5</td>
</tr>
<tr>
<td>9. <strong>Bonus:</strong> Teachers incorporate IPM for microbial pests into curricula and/or class projects.</td>
<td>5</td>
</tr>
<tr>
<td>10. <strong>Bonus:</strong> Custodial products in aerosol cans are not used (except graffiti-removal products).</td>
<td>5</td>
</tr>
</tbody>
</table>

**Resources for Microbial Pest Management:**


City of Santa Monica CA, 1998. Custodial Products Bid Specifications. 6 pp. Details on criteria used by the City to evaluate custodial/maintenance products. Prospective suppliers are required to submit a complete information package on each product. Available at [http://www.ci.santa-monica.ca.us/environment/policy/purchasing/bidspecs.htm](http://www.ci.santa-monica.ca.us/environment/policy/purchasing/bidspecs.htm).

Culver, A., et. al. 2002. Cleaning for Health: Products and Practices for a Safer Indoor Environment. This report is a guide to environmentally preferable cleaning products and methods that have been effectively used in office buildings, schools, hospitals and other facilities in the United States and Canada. It describes pioneering product evaluation programs and lists the brands that were chosen based on environmental and performance criteria. It also provides a model specification, as well as manufacturer contacts and other resources for those who want to develop a safer cleaning program for their buildings. 86 pp document available for order at http://www.informinc.org/cleanforhealth.php. Price is $30, $15 for government or non-profit use.


Hollingsworth et al., 2002. Microbial Pests. Pp. 43-44. In Integrated Pest Management for Northeast Schools. Photos, descriptions and ways in which to manage microbial pests in schools. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


US EPA. Environmentally Preferable Purchasing Database: Cleaning supplies and equipment. Links to contract language, voluntary product standards or guidelines and additional information on cleaners, deodorizers, detergents, finishes, paint removers, polishes and other cleaning products. Includes program contacts, methodology and attributes (e.g., biodegradability, emissions, health impacts, packaging, etc.). http://www.epa.gov/oppt/epp/database.htm.


United States Office of the Federal Environmental Executive. Website. Comprehensive website includes information and links on green janitorial products and services including PowerPoint presentations and links to which state and local governments use green cleaners. Available at http://www.ofee.gov/gp/greenjanitorial.html.

Western Regional Pollution Prevention Project. Janitorial Products. Website contains general and in-depth information on cleansers and chemicals commonly used in cleansers. Includes fact sheets, commentaries and tools on the topic. Available at http://www.wrpnn.org/Janitorial/ip4.cfm.

Notes:
Section 11. Mosquitoes

[ ] NOT APPLICABLE (Check here if mosquitoes are not a problem requiring action in your school and proceed to the next section.)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority: Action thresholds for key mosquito pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. An inspection/monitoring program for standing water and/or mosquito larvae and adults is specified in the IPM Plan and implemented to detect and correct problem sites early.</td>
<td>20</td>
</tr>
<tr>
<td>3. When mosquito problems occur, the problem mosquito is identified before taking action. Actions are appropriate for the problem mosquito.</td>
<td>20</td>
</tr>
<tr>
<td>4. When mosquito problems occur, contributing factors are identified and corrected (e.g., repair/install screens and vent filters; correct standing water on building roofs, in gutters, drainage sumps or channels, or on school grounds in items that collect water such as tarps, equipment, cans, etc.).</td>
<td>20</td>
</tr>
<tr>
<td>5. Pest management roles communicated at least annually to maintenance staff include prompt reporting and/or correction of standing water, mosquito problems and safe and effective use of repellants (e.g., as per EPA recommendations).</td>
<td>5</td>
</tr>
<tr>
<td>6. Public health officials involved in regulating and inspecting mosquito management in schools are made aware of the school’s IPM Policy, IPM Plan and mosquito monitoring procedures.</td>
<td>10</td>
</tr>
<tr>
<td>7. Priority: Reduced-Risk or Least-Risk Options are the only methods used for mosquito management.</td>
<td>5</td>
</tr>
<tr>
<td>8. Bonus: Pest Manager can identify mosquitoes common to the region on sight (e.g., Asian Tiger Mosquito, Common Malaria Mosquito, House Mosquito, Yellow-Fever Mosquito).</td>
<td>10</td>
</tr>
<tr>
<td>9. Bonus: Teachers incorporate IPM for mosquitoes and information on diseases vectored by mosquitoes into curricula and/or class projects.</td>
<td>10</td>
</tr>
<tr>
<td>10. Least-Risk Options are the only methods used for mosquito management.</td>
<td>5</td>
</tr>
</tbody>
</table>

Resources for Mosquito Management:


Brammer, Angela. 2002. “Insect Repellents Provide Safe Relief With Proper Use.” PCT Magazine. The article mentions types of repellents, safety guidelines and where to obtain additional information as well as providing a PDF version of the mosquito handout designed to be torn out of the magazine so that companies can reproduce it, stamp their company name and address on the top and distribute to customers. The article and PDF handout is available at http://www.pctonline.com/articles/article.asp?MagID=1&ID=1638&IssueID=166.


Notes:
Section 12. Occasional Invaders: Bats, Booklice, Centipedes, Firebrats, Millipedes, Mites, Scorpions, Silverfish, Snakes, Spiders, Ticks

[ ] NOT APPLICABLE (Check here if these pests are not a problem requiring action in your school and proceed to the next section.)

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20</td>
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<td>2.</td>
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<td>3.</td>
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<td>4.</td>
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<tr>
<td>5. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for occasional invader management.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6. <strong>Bonus:</strong> Pest Manager can identify occasional invaders common to the region on sight.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7. <strong>Bonus:</strong> Teachers take advantage of encounters with occasional pests to educate students on the organisms biology, disease vector potential, behavior, and/or beneficial aspects.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8. Least-Risk Options are the only methods used for occasional invader management.</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Resources for Occasional Invader Management:**


---

Mosquitoes


Notes:

Mosquitoes

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Section 13. Rodents: Mice, Rats

1. **Priority:** Persons handling rodent traps or bait stations, or inspecting suspected harborages (e.g., crawl spaces, attics):
   a) are trained in public health risks and proper hygiene; and
   b) wear appropriate protective gear.
   10 ________

2. Traps, bait stations or other surfaces contaminated with rodent urine or feces are properly disinfected or disposed of.
   10 ________

3. **Priority:** Action thresholds for key rodent pests are defined in the IPM Plan and effectively implemented.
   20 ________

4. **Priority:** Rodenticides are used only by personnel fully trained in bait selection (coagulant vs. anticoagulants, blocks vs. pellets vs. grain-based, tracking powders, etc.) and use of tamper-resistant bait stations. *If rodents are managed effectively without rodenticides, score as N/A.*
   20 ________

5. When rodent problems occur, the problem rodent is identified correctly before taking action. Actions are appropriate for the problem rodent.
   20 ________

6. When rodent problems occur, contributing factors corrected (e.g., exclusion, sanitation, modify habitats, etc.).
   20 ________

7. **Bonus:** Traps used for rodent monitoring or management are checked daily and any trapped rodents still alive are disposed of in a humane manner. *If rodents are managed effectively without traps, score as N/A.*
   10 ________

8. Pest management roles communicated to maintenance and food preparation/serving staff at least annually include prompt reporting of rodent problems.
   10 ________

9. **Priority:** Snap traps, if used for rodents, are placed only in areas not accessible to children (e.g., locked storage rooms) or in locked, tamper-resistant containers securely attached to the floor, ground or wall so that the container cannot be picked up or moved. *If rodents are managed effectively without snap traps, score as N/A.*
   20 ________

10. Inspections for rodents include examining school grounds for food sources (e.g., edible plants, fallen fruit and nuts, animal feces) and stretches of dense vegetation or tall ground cover that allow rodents to travel long distance under cover. If signs of rodent feeding or activity are found, these conditions are corrected.
    10 ________

11. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for rodent management.
    5 ________

12. **Bonus:** Pest Manager can identify rodents common to the region on sight (e.g., Deer, House, White-Footed Mice; Norway, Black, Roof Rats).
    10 ________

13. **Bonus:** Teachers incorporate IPM for rodents into curricula and/or class projects.
    10 ________

14. Least-Risk Options are the only methods used for rodent management.
    5 ________
Rodents

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Notes:
### Section 14. Stinging Insects: Ants, Bees, Wasps

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
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<tbody>
<tr>
<td>20</td>
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</tbody>
</table>

1. **Priority:** Stinging insect nests that can be disturbed by children are destroyed.  

2. Any nest destruction, treatment or removal is conducted when children are not present and by a licensed professional wearing appropriate protective equipment. Gasoline, oil or other materials not labeled for this use are not used.

3. **Priority:** Action thresholds for key stinging insect pests are defined in the IPM Plan and effectively implemented.

4. When stinging insect problems occur, the problem pest is identified before taking action. Actions are appropriate for the problem pest.

5. When stinging insect problems occur, contributing factors are identified and corrected (e.g., seal cracks or crevices, repair screens, resolve sanitation problems, remove nests).

6. Monitoring and inspection for stinging insects (e.g., yellowjackets) begins early in the season and actions are taken as soon as predetermined action thresholds are exceeded to prevent buildup of stinging insect populations.

7. Pest management roles assigned and communicated at least annually to school staff include prompt reporting all stinging insect nests sited on school grounds.

8. If traps are used for stinging insect management, traps are placed out of reach of children and are in place only during times of the year when stinging insects are present. Reusable traps are cleaned before end-of-season storage. **If stinging insects are managed effectively without traps, score as N/A.**

9. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for stinging insect management.

10. At the start of each yellowjacket season, school staff are informed about stinging insect management including safety, how to obtain first aid, reporting and sanitation.

11. Plants attractive to yellowjackets (e.g., fruiting trees and shrubs) are not planted near school entrances or are removed and replaced with non-attractive plants.

12. Outdoor consumption of food or drinks attractive to yellowjackets is not permitted during yellowjacket season.

13. Trash and recycling cans on school grounds have spring-loaded door access to restrict yellowjacket access.

14. Cans are emptied frequently to prevent accumulated trash from blocking door closure.
15. Dumpsters and adjacent areas are maintained in clean condition.  

16. Problem honeybee nests are physically removed from buildings or school grounds without use of pesticides by a professional apiculturist.  *If problem nests have not occurred, score as N/A.*

17. After removal of nests from buildings, structural modifications (e.g., cracks are filled, damaged wood is replaced, wall voids are filled) are made to prevent reinfestation.  *If problem nests have not occurred, score as N/A.*

18. **Bonus:** Pest Manager can identify common stinging and related non-stinging insects and nests on sight (e.g., Velvet Ant, Fire Ant; Bumble Bee, Carpenter Bee, Honey Bee; Bald-Faced Hornet, Mud-Dauber Wasp, Paper Wasp, Yellowjacket).

19. **Bonus:** Teachers incorporate IPM for stinging insects into curricula and/or class projects.

20. Least-Risk Options are the only methods used for stinging insect management.

Resources for Stinging Insect Management:


Stinging Insects

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Section 15. Stored Product Pests: Moths, Beetles

[ ] NOT APPLICABLE (Check here if these pests are not a problem requiring action in your school and proceed to the next section.)

<table>
<thead>
<tr>
<th></th>
<th>Priority</th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Comprehensive building inspections include examining carpets; stored food, fabric and leather goods; insect, bird and animal specimens; closets, cabinets and other storage areas; and other potential food sources and harborage</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>2.</td>
<td>When stored product pest problems occur, the problem pest is identified before taking action. Actions are appropriate for the problem pest.</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>When problems occur, contributing factors are corrected (e.g., modify storage, remove and disposed of unneeded stored products, etc.).</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>4.</td>
<td>Incoming shipments of dried fruit, flour, nuts, grains, bird or animal specimens or other products at high risk are inspected for signs of infestation on delivery. Infested products are returned to the shipper.</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>Carpets, fabrics and leather goods are thoroughly inspected and cleaned before storage and stored in moth and beetle-proof packaging if possible. If pest-proof storage is not possible, stored items are re-inspected and shaken, brushed or aired out at least twice annually. Stored bird and animal specimens are carefully inspected before storage.</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>6.</td>
<td>Priority: Reduced-Risk or Least-Risk Options are the only methods used for stored product pest management.</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>Stored dried fruit, vegetables, flour, grains, cereals, nuts, bird seed, pet food and other susceptible foods are refrigerated or stored in tightly sealed metal or glass containers with rubber seals on lids.</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>8.</td>
<td>Communications to teachers include proper storage of these materials (listed in #7 above) if used and stored in classrooms.</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>9.</td>
<td>Bonus: Pest Manager can identify major stored product pests common to the region on sight (e.g., Angoumois Grain Moth, Casemaking Clothes Moth, Indian Meal Moth, Mediterranean Flour Moth, Webbing Clothes Moth; Black Carpet Beetle, Black Larder Beetle, Common Carpet Beetle, Drugstore Beetle, Flour Beetles, Hide Beetle, Larder Beetle, Varied Carpet Beetle, Warehouse Beetle).</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>10.</td>
<td>Bonus: Teachers incorporate IPM for stored product pests into curricula and/or class projects.</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>11.</td>
<td>Least-Risk Options are the only methods used for management of stored product pests.</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
Resources for Stored Product Pest Management:


Hollingsworth et al., 2002. Pantry or Stored-Product Pests. Pp. 38-40. In Integrated Pest Management for Northeast Schools. Photos, descriptions and ways in which to manage pantry or stored-product pests in schools. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


Notes:

Stored Product Pests

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Section 16. Wood-Damaging Pests: Carpenter Ants and Bees, Fungi, Termites, Wood-Boring Beetles

[ ] NOT APPLICABLE (Check here if wood-damaging pests are not a problem requiring action in your school and proceed to the next section.)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wood structural components of buildings are inspected on a regular basis for wood-damaging pests and damage by qualified professionals such as contracted or in-house maintenance or pest management professionals. Inspection intervals (e.g., annual, semi-annual) are appropriate to the region, building age and condition, history of problems, etc.</td>
<td>20</td>
</tr>
<tr>
<td>2. Priority: Action thresholds for key wood-damaging pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>3. When wood-damaging pest problems occur, the problem pest is identified before taking action. Actions are appropriate for the problem pest.</td>
<td>20</td>
</tr>
<tr>
<td>4. When problems occur, contributing factors are corrected (e.g., modify storage, remove and disposed of unneeded stored products, etc.).</td>
<td>20</td>
</tr>
<tr>
<td>5. A communications/training program is in place to personnel responsible for building structural maintenance to recognize wood-damaging pests and damaged wood.</td>
<td>10</td>
</tr>
<tr>
<td>6. Tree stumps, firewood piles or leftover scraps of wood from construction are removed to a distance of at least 10 feet from any foundation. Wood debris is not buried on school grounds. Stored wood and wood products are not permitted to contact soil.</td>
<td>10</td>
</tr>
<tr>
<td>7. Priority: Reduced-Risk or Least-Risk Options are the only methods used for wood-damaging pest management.</td>
<td>5</td>
</tr>
<tr>
<td>8. Building “skins” or outer surfaces are maintained in good repair and sealed using paint, putty and caulk. Cracks in foundations are patched promptly.</td>
<td>10</td>
</tr>
<tr>
<td>9. Wood, wooden furniture and other wooden objects are carefully inspected for beetle infestation and rots before use in buildings. Infested items are treated or discarded.</td>
<td>5</td>
</tr>
<tr>
<td>10. Kiln-dried wood is used in all construction projects.</td>
<td>5</td>
</tr>
<tr>
<td>11. Alternatives to wood (aluminum, concrete, steel, vinyl) are used for moisture-prone areas of new or renovated buildings where practical.</td>
<td>5</td>
</tr>
<tr>
<td>12. Bonus: Pest Manager can identify wood-damaging pests common to the region on sight (e.g., Carpenter Ants vs. termites).</td>
<td>10</td>
</tr>
<tr>
<td>13. Bonus: Teachers incorporate IPM for wood-damaging pests into curricula and/or class projects.</td>
<td>10</td>
</tr>
<tr>
<td>14. Least-Risk Options are the only methods used for wood-damaging pest management.</td>
<td>5</td>
</tr>
</tbody>
</table>
Resources for Wood-Damaging Pest Management:


Notes:

There was an old woman who swallowed a fly... During an inspection of a school facility, occupants mentioned problems with flies. The inspector found Green Bottle Flies caught on glue boards behind a water fountain.

Next to the flies on the glue boards were several expired mice. Green Bottle Flies lay their eggs in the carcasses of dead animals, and had been attracted by the unfortunate rodents.

Further inspection revealed that the mice were entering the building through a hole in the bottom of a wooden doorway. The hole was the result of wood-damaging fungi invading the wooden sill.

It was raining at the time of the inspection, and water was pouring out a hole in a downspout, and splashing onto the steps and up onto the door sill.

The failure to inspect and maintain the drain pipe was thus responsible for the wet wood, which invited wood-rotting fungi, which softened the wood, which let the mice gnaw the hole in the door sill, that let in the mice that died on the glue board and attracted the flies, that caught the attention of the school's occupants...

- Courtesy of Don Rivard, Rivard's Resources: IPM, Waltham MA

Wood-Damaging Pests

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Part II. IPM Standards for School Grounds
**MODULE ONE: IPM FOUNDATION for School Grounds**

**Section 1. IPM Planning and Communication**

1. Appropriate personnel (e.g., superintendent, facilities manager, principal, *IPM Coordinator*) understand and ensure that school meets all Federal, State and local legal requirements related to pest management on school grounds (e.g., posting, notification, pesticide management, etc.). *Legal requirements that exceed or conflict with practices in these Standards supercede those listed here.*

2. Resources are identified and acquired to assist in developing and implementing IPM (e.g., state/county Extension personnel, publications and on-line resources; non-governmental organizations, pest management professionals with expertise in school IPM).

3. A written *IPM policy* is adopted which:
   a. states a commitment to IPM implementation;
   b. identifies overall objectives relating to pest and pesticide risk management;
   c. is used to guide decision-making; and
   d. is reviewed at least once every three years and revised as needed.

4. An *IPM Committee* is formed to create and maintain the IPM policy, provide guidance in interpreting the policy and provide oversight of the program.

5. An *IPM Coordinator* is designated to provide day-to-day oversight of IPM implementation.

6. A plan is developed and implemented to provide necessary IPM training for the IPM Coordinator.

7. *Pest Manager* is aware of and has access to resources to identify key pests.

8. A pesticide notification policy is implemented such that:
   a. At least 24 hours prior to pesticide application, postings are placed in a designated public area detailing locations to be treated and contact information for further information (exceptions may be made for applications made for emergencies, where an imminent threat to health exists (e.g., stinging insects), or for applications of anti-microbials and for pesticides defined as Least-Risk (Appendix A); for emergency applications, postings must be placed as soon as practical);
   b. this notice remains posted for at least 48 hours after the application;
   c. copies of the pesticide label and MSDS sheet for the material(s) to be used.
used are available on request and maintained on file in a central
location (e.g., main office); and

d. additional postings are placed on school grounds at the entry points
of sites of pesticide applications in accordance with all laws. 10

9. Complete, legible records of each pesticide application, including product,
quantity used, date and time of application, location, application method
and target pests are maintained for at least three years. 20

10. Public access is provided on request to all information about the IPM
policy, IPM plan and implementation. 20

Section 2. Inspection, Sanitation and Exclusion

1. At least a preliminary review of school grounds is conducted to determine
nature and extent of pest problems and contributing factors. This
information is used to set IPM priorities. 20

Section 3. Pest and Pesticide Risk Management

1. All pesticide applications are made by a person certified and/or licensed
by the state to apply pesticides in commercial settings and treatment
areas (e.g., turf). 20

2. All pesticide applications are made only after detection of a verifiable pest
problem and accurate identification of the pest. Applications are not
made on a routine or regularly scheduled basis (e.g., weekly, monthly
applications are not made). 20

3. At least a preliminary review of pesticide use practices on school grounds
is conducted to evaluate pesticide risks. This information is used to set
priorities for reducing or replacing high-risk pesticides and use practices. 20

Total MODULE ONE IPM Points Available 300
Total MODULE ONE Points Earned

About MODULE ONE and MODULE TWO IPM Practices

MODULE ONE and TWO practices are recommended for all school IPM programs, and represent
an excellent starting point for new programs. These practices should be substantially completed
before moving on. For certification, each MODULE ONE and TWO practice must be substantially
completed (earn 80% or more of the points available for each practice). As you work through the
Standards, be sure to note which practices need improvement.

For information on how to implement IPM practices,
including model IPM policies, see the list on the pages following MODULE ONE.
For an explanation of unfamiliar terms, see the Glossary in Appendix B.

Completed MODULE ONE or MODULE TWO? See the IPM Institute Web site
for an “IPM in Progress” Certificate, recognizing your accomplishment!
Evaluating Your Performance

Perfection is an ideal rarely accomplished in the real world. When evaluating your performance on IPM practices listed in these standards, use a critical eye to identify areas for improvement. Make a note of the action needed and score the practice accordingly. Remember, continuous improvement in reducing pests and pesticide risks is the goal, not a perfect score.

For certification purposes, Certified IPM Verifiers will also apply this perspective, working with you in a supportive manner to improve the effectiveness and efficiency of your IPM program.
**Resources for IPM Administration and Policy**

**IPM Planning and Communication**


Koehler et al., 1999. School IPM Web Site. University of Florida. [Model IPM policy statement][model pest control service contract specifications][model IPM training and workshop agendas][model pest sightings log][model intent to apply pesticides notice][setting action thresholds][links to national and state resources for IPM in schools and IPM-related curricula resources]. Available at [http://schoolipm.ifas.ufl.edu](http://schoolipm.ifas.ufl.edu).


Maine Department of Agriculture. Action Thresholds in School IPM Programs. Pesticide Regulation Section, Annapolis, MD. 2-page document includes thoughts on IPM techniques, pest management objectives, the IPM coordinator, record keeping, notification and posting, pesticide storage and purchase and pesticide applicators. Available in Word or PDF format at [http://www.state.me.us/iculture/pesticides/schoolipm](http://www.state.me.us/iculture/pesticides/schoolipm).

Maine School Integrated Pest Management Program. A Model Integrated Pest Management Policy Statement for Maine Schools. 2-page document includes thoughts on IPM techniques, pest management objectives, the IPM coordinator, record keeping, notification and posting, pesticide storage and purchase and pesticide applicators. Available in Word or PDF format at [http://www.state.me.us/iculture/pesticides/schoolipm](http://www.state.me.us/iculture/pesticides/schoolipm).


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Mertz, et al. Maryland Department of Agriculture, Pesticide Regulation Section publishes report entitled Contracting Guidelines for IPM Services in Maryland Public Schools. Includes an introduction to IPM in schools, general contracting components of IPM in schools, and general information on pest control, program reporting, evaluating and training. Also includes a synopsis of Maryland Pesticide Applicators Law and Regulations. Available in PDF form at http://schoolipm.ifas.ufl.edu/admn_con.htm.


Natural Resource, Agriculture, and Engineering Service (NRAES), 2002. Integrated Pest Management for Northeast Schools. Introduction that answers the questions What is IPM? and Why Practice IPM in Schools?; Chapter on the Components of an IPM Program; Chapter on Establishing an IPM Program in Your School; Chapter on Managing Pests Found in Northeast Schools including a detailed list of common pests. Also includes appendices on School IPM Checklist, Examples of Action Thresholds and General Recommendations for Pesticide Applications. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7645 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


President’s Task Force on Environmental Health Risks and Safety Risks to Children. 2003. Inventory of Federal School Environmental Health Activities. Inventory systematically lists all federal agencies’ school environmental health programs. Includes the U.S. Departments of Agriculture, Education, Energy, Health and Human Services, Labor, Interior as well as extensive lists of the U.S. Environmental Protection Agency’s current projects and resources. In PDF at http://yosemite.epa.gov/ochp/chwmsuf.nsf/content/Inventory.htm/ $file/Inventory.pdf. Also available in HTML version at http://yosemite.epa.gov/ochp/chwmsuf.nsf/content/whatwe_tf_proj.htm.


Safer Pest Control Project. 4-page model school pest management policy statement for schools. Available at http://www.spcpweb.org/schpolicy.pdf.

Safer Pest Control Project. Integrated Pest Management in Schools: A Better Method. This 12-minute video is aimed at helping schools, parents, pest control operators, and other groups understand and promote School IPM. Filmed at a Chicago-area school that has practiced IPM since 1994, it features testimony and advice from the school's pest control operator and operations manager. It addresses concerns about pesticide use, the advantages of practicing IPM, and the basic components of IPM. For more information, see School IPM Video Brochure and Order Form or call Safer Pest Control Project at (312) 641-5575.

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"Sustainable Schools Minnesota: High Performance Schools for Higher Performing Students." 2000. LHB Engineers and Architects, Factor 10, LLC, Intep/AW Consulting, and Elk River Area School District. Funded by the MN Office of Environmental Assistance, this free 56-page document is aimed at school board members and other decision-makers involved in the design, construction, and management of schools, and aims to help them with pre-design decisions that can lead to higher performing schools and students. Sections of this report include: Introduction: Schools as Symbols, Highlights of High Performance School Design, Financial Implications of High Performance Schools, Process Overview, Components of High Performance School Design, and Case Examples. Free copies of the report are available from the OEA’s Education Clearinghouse at (651) 215-0232 or (800) 877-6300 or clearinghouse@moea.state.mn.us.


Texas Cooperative Extension. Model Contract Bid Specifications. Model of bid specifications for schools. Includes sections entitled description of services, bid requirements, scope of work, general contractor responsibilities, pest control responsibilities and list of site(s) to be treated. Available at http://schoolipm.tamu.edu/resources/resources/Technical_Information/BIDSPEC2.htm.


US EPA. 2002. EPA Guide to Protecting Children’s Health in Schools. The US EPA has created an online or downloadable guide to identifying potential hazards in schools. The guide includes planning tools, a virtual tour of a school to help identify hazards, a section on case studies as well as a list of resources and contacts. Available at http://www.epa.gov/seahome/child.html.


University of Florida. 2001. School IPM Model Contract. Extensive outline designed to be used by officials working in schools, such as purchasing agents, who are responsible for procuring pest management services. Available at http://schoolipm.ifas.ufl.edu/doc/model_contract.htm.


**Inspection, Sanitation and Exclusion**


**Pest and Pesticide Risk Management**

American School and University. 1999. “A Bug's Life.” Explains the use of integrated pest management (IPM) to help make schools safer and provide a healthier environment for students and staff. Cost considerations when implementing an IPM are discussed as are key factors in establishing a program. Available at [http://asumag.com/ar/university_bugs_life/index.htm](http://asumag.com/ar/university_bugs_life/index.htm).


Attorney General of New York, New York State Dept. of Law, and Environmental Protection Bureau. 1996. Pesticides in Schools: Reducing the Risks. Based on concerns that children and staff may be unnecessarily and unwittingly exposed to pesticides in their schools, the New York Attorney General's Office initiated a state-wide study.

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**Resources for IPM Administration and Policy**

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of pesticide use in New York State in the public schools. This report describes this state-wide survey, provides information about some of the potential dangers of these chemicals, and recommends steps that schools and communities can take to minimize pesticide use. 33p. Available on http://www.oag.state.ny.us/environment/schools96.html.


California State Parent Teacher Association Newsletter. 1998. “Pesticides In Our Schools.” Newsletter discusses use of pesticides on school grounds, parking lots, tracks, play areas, cafeterias, classrooms, gymnasiums and rest rooms, causing acute and chronic health problems.


Cleaning and Maintenance Management Online. 2000. "EPA Encourages Schools to Adopt Pest-Control Option." The Environmental Protection Agency says school administrators and facility managers who make pest control decisions for school buildings and grounds should become aware of the pest control options available to them. Schools across the nation adopting such programs have reported successful, cost-effective conversion to IPM, which can reduce the use of chemicals and provide economical and effective pest suppression. Available at http://www.facility-maintenance.com/article.asp?IndexID=6630599.


Dahlgren, S. 2000. Athletic Business. "Fowl Play." Discusses ways some universities have dealt with eliminating insects and wildlife from their athletic fields, the types of problems to look for, the damage pests can cause, the safety issues involved, and tips on remedies are examined. Available at http://www.athleticbusiness.com/articlearchive/content/AB-0100-62.pdf.


Heathy Schools Network, Inc. 1999. Children, Learning, and Poisons Don't Mix: Kick the Pesticide Habit. This 8-page brochure examines basic information about pesticides and their use in and around schools, how children are exposed to pesticides and their health effects, and how a school can kick the habit of using pesticides. To order, write Healthy Schools Network, Inc., 773 Madison Avenue, Albany, NY 12208; Tel: 518-462-0632, ERIC NO: ED447680.

James, A. 2000. School Planning and Management. "Keep Pests from Becoming a Problem in Your School." Examines the use of pesticides in an integrated pest management (IPM) program. The three steps to creating an IPM are discussed along with IPM personnel communication requirements and the need for written policies managed by a knowledgeable coordinator.

Minnesota Department of Children, Families and Learning. 2000. Web site provides manufacturer name, EPA Toxicity Category and Signal Words for pesticides used in school buildings and grounds; search using EPA registration number, or trade or active ingredient name. Available at http://cfls.state.mn.us/pesticide.


National Environmental Education & Training Foundation. 2003. National Pesticide Competency Guidelines for Medical & Nursing Education and the National Pesticide Practice Skills Guidelines for Medical & Nursing Practice. The National Environmental Education & Training Foundation (NEETF), in partnership with the U.S. Environmental Protection Agency, and in collaboration with the U.S. Department of Health and Human Services, the U.S. Department of Agriculture, and the U.S. Department of Labor, has published guidelines that will serve as tools for focusing schools and practicum programs on pesticide health education, provide guidance directly to nurses and physicians to advance their awareness and skill in recognizing and managing pesticide-related illness, and act as a model for faculty and administrators in integrating specific pesticide issues into education and training. These documents can be viewed and downloaded at http://www.neETF.org/Health/publications.shtm. Paper copies will be available later this year. For more information, contact: The National Environmental Education & Training Foundation, National Strategies for Health Care Providers: Pesticides Initiative; 1707 H Street, NW, Suite 900, Washington, DC, 20006-3915; 202-833-2933 x 535.


Natural Resource, Agriculture, and Engineering Service (NRAES), 2002. Integrated Pest Management for Northeast Schools. Introduction that answers the questions What is IPM? and Why Practice IPM in Schools?; Chapter on the Components of an IPM Program; Chapter on Establishing an IPM Program in Your School; Chapter on Managing Pests Found in Northeast Schools including a detailed list of common pests. Also includes appendices on School IPM Checklist, Examples of Action Thresholds and General Recommendations for Pesticide Applications. Available from NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information, contact NRAES by phone at 607-255-7654 or fax at 607-254-8770 or e-mail at NRAES@CORNELL.EDU.


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Pesticide Action Network. 2000. PAN Pesticide Database. Comprehensive online database on the health hazards of more than 5,100 ingredients in pesticides including whether a pesticide is a carcinogen, a reproductive or developmental toxicant or causes other harm to health and which chemicals pollute ground water or kill aquatic wildlife. Sources include the World Health Organization, National Institutes of Health, National Toxicology Program, U.S. Environmental Protection Agency and independent published and peer-reviewed research. Available at http://www.pesticideinfo.org.


United States Poison Control Center Central Hotline. Officials launched the national hotline, 1-800-222-1222, and applauded it as an overdue coordination of the country's 65 separately-run poison centers. Callers dialing the number will be automatically linked to the closest poison center.

United States Senate. 1999. Pesticides: Use, Effects, and Alternatives to Pesticides in Schools. Report to the Ranking Minority Member, Committee on Governmental Affairs. The 18-page report addresses the following questions: 1) what federal requirements govern the use of pesticides in schools? 2) what information exists on the use of pesticides in schools? 3) what data exist on the incidences of short and long term illnesses linked to exposure to pesticides in schools? 4) are the EPA and the states taking actions, where appropriate, to reduce the use of pesticides in schools, and if so, what are the results of these efforts? Available at http://www.gao.gov/archive/2000/rc00017.pdf or, to order a hard copy, contact the U.S. General Accounting Office, P.O. Box 37050, Washington, DC 20013; Tel: 202-512-6000. Report NO: GAO/RCED-00-017.


University of Nebraska. Pesticide applicator training manuals. Includes Applying Pesticides Correctly, Private Applicator Self-Study Manual, and a series of category manuals including aerial, agricultural, aquatic, ornamentals, structural, etc. Manuals include self-study guides and tests. http://pested.unl.edu/training.htm
MODULE TWO: IPM FRAMEWORK for School Grounds

Section 1. IPM Planning and Communication

1. Pest management roles are developed for and communicated at least annually to:
   a) administrators (e.g., principals regarding posting, notification, reporting, etc.);  5
   b) teachers (e.g., do not bring in/apply pesticides, sanitation, etc.);  5
   c) custodians (e.g., pest sightings log, inspection, sanitation, exclusion, etc.);  5
   d) food handlers (e.g., sanitation, exclusion, etc.); and  5
   e) outside contractors (e.g., IPM policy, posting, pest control options to outside pest, landscape and turf management professionals).  5

2. Pest management roles are developed for and communicated at least on an as needed basis (e.g., head lice incident):
   a) students (e.g., reporting, sanitation, head lice prevention, etc.); and  5
   b) parents (e.g., no nit policy).  5

3. A written IPM Plan is prepared that includes a schedule for inspection and monitoring of school grounds and schedule for areas requiring more frequent inspection/monitoring (e.g., athletic fields).  20

4. If outside contractors provide pest control services, a written contract is signed identifying specific IPM practices to be used including regular inspections, monitoring where appropriate, record-keeping and agreement to abide by the IPM Policy and IPM Plan, including use of only Reduced-Risk or Least-Risk Options for schools pursuing certification. If outside contractors are not used, score as N/A.  20

5. A Pest Sightings/Damage Log is kept in a designated area (e.g., main office). Turf and landscape maintenance staff, athletic department staff and others who supervise those using school grounds are instructed to report all pest-related incidents to the log including date, time, exact location, a description of the pest or pest damage and the name of the person reporting. Pest Manager reviews reports promptly, and records and dates responses taken to each report. This log may be part of a general maintenance issue reporting system.  20

6. School notifies all students, staff and others requesting special consideration in the event of a pesticide application:
   a) school provides direct notification to those individuals at least 48 hours in advance of any pesticide application; and  10
b) school communicates that this notification option is available to parents and staff at least annually.

Exceptions may be made where an imminent threat to health exists (e.g., stinging insects), or for applications of pesticides defined as Least-Risk (Appendix A), or for situations where the school grounds will be unoccupied for 72 hours. For emergency applications, postings must be placed as soon as practical.

7. Key staff (e.g., IPM Coordinator, Pest Manager, turf and landscape maintenance staff) participate in IPM training at least annually. Training is adequate and appropriate to the IPM roles fulfilled by these staff members.

Section 2. Inspection, Sanitation and Exclusion

1. A comprehensive inspection of all school grounds is conducted by an in-house or contracted pest management professional for defects including cracks in walkways and driveways; food, moisture and shelter resources available to pests; moisture, pest or other damage to fences, retaining walls, irrigation and drainage systems, etc.; pest runways, pest fecal matter or other signs of pest activity; etc. A report of all defects is prepared and corrective actions are identified.

2. Legible records are maintained of inspection results, including date, pests and/or pest damage found and location, estimate of pest density or damage level, recommendation, actions taken and evaluations of results.

3. A timeline is established for completion of corrective actions and evaluation of results.

Section 3. Pest and Pesticide Risk Management

1. Pesticide inventories are maintained only if personnel properly licensed to apply those pesticides are on staff. Storage is tightly controlled to prevent unauthorized access. If pesticide inventories are not maintained by the school, score as N/A.

2. Baits (e.g., for rodents), if used, are:
   a) placed in areas inaccessible or off-limits to children;
   b) placed in a locked, distinctively marked, tamper-resistant container designed specifically for holding baits and constructed of metal, plastic or wood;
   c) used in bait containers securely attached to immovable objects such that the container cannot be picked up and moved;
   d) placed in the baffle-protected feeding chamber of the bait container and not in the runway;
   e) If used in wet areas, are parafinized or weatherproof; and
f) not used outdoors unless bait containers are inaccessible to children (e.g., placed underground in pest nests or on building roofs).  

If pests are managed effectively without baits, score as N/A.

3. Reduced-Risk or Least-Risk Options are the only methods used.  

Total MODULE TWO IPM Points Available 265
Total Points Not Applicable ___
Total MODULE TWO Points Earned ___

Note items requiring additional action:

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MODULE TWO IPM Practices
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MODUL THREE: Administrative & Policy Practices for School Grounds

Section 1. IPM Planning and Communication

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority</strong>: The IPM Plan includes a list of key pests and action thresholds for each key pest (even if threshold is one, i.e., no tolerance).</td>
<td>20</td>
</tr>
<tr>
<td>2. <strong>Priority</strong>: The IPM Plan includes a list of management options to be used when key pest problems occur and specifies lesser risk options (e.g., sanitation, exclusion) to be used before resorting to actions with greater risk factors. (See Appendix A for discussion on risk ranking.)</td>
<td>20</td>
</tr>
<tr>
<td>3. The IPM Plan includes a list of actions to prevent and avoid key pest problems (e.g., replacement of problem plants, moving problem plants to more favorable locations, slope modification, pavement replacement and repair) and a timeline for implementation.</td>
<td>20</td>
</tr>
<tr>
<td>4. If outside professional pest management or grounds maintenance contractors are used, bids are evaluated not only on the basis of cost but also on the contractor’s:</td>
<td></td>
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<tr>
<td>a) experience and performance history with an IPM approach;</td>
<td>5</td>
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<tr>
<td>b) ability to conduct preventative inspections;</td>
<td>5</td>
</tr>
<tr>
<td>e) ability to apply treatments after school hours; and</td>
<td>5</td>
</tr>
<tr>
<td>f) demonstrated practice of using lowest risk control options first.</td>
<td>5</td>
</tr>
<tr>
<td><em>If outside contractors are not used, score as N/A.</em></td>
<td></td>
</tr>
<tr>
<td>5. The IPM Plan specifies preventative and avoidance strategies for grounds maintenance and new or renovated landscape design such as avoiding pest-prone plants, proper placement, etc.</td>
<td>10</td>
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<tr>
<td>6. The IPM Plan divides turf and landscape areas by basic use level (i.e., athletic fields vs. lawns, highly visible vs. less visible landscape areas). Monitoring frequency and thresholds are appropriate to each level.</td>
<td>5</td>
</tr>
<tr>
<td>7. The IPM Plan subdivides turf areas by advanced level of use (i.e., athletic fields with limited use for publicly attended events vs. athletic fields for daily practice and general use). Monitoring schedules and action thresholds are appropriate to each level.</td>
<td>5</td>
</tr>
<tr>
<td>8. A complete inventory of all existing lawn maintenance equipment is maintained, as well as a list of desired equipment for reduced risk pest control options (e.g., aerator, de-thatcher, spring-tooth harrow, flotation tires, etc.). Desired equipment is worked into the budget over time.</td>
<td>10</td>
</tr>
<tr>
<td>9. Grounds staff or Pest Manager reads an Extension newsletter/report of current pest information in season. <em>If not available, score as N/A.</em></td>
<td>10</td>
</tr>
</tbody>
</table>
10. Information bulletins are distributed at least annually to inform staff, students, parents and others as appropriate about key IPM issues such as roles, reporting, sanitation, etc.

11. School notifies staff and parents at least 48 hours in advance of the application of any pesticide not on the Least-Risk Pest Control Option List. Such notification may be incorporated in any notice being sent to staff or parents meeting the 48-hour advance timing. Exceptions may be made for applications made for emergencies, where an imminent threat to health exists (e.g., stinging insects). For emergency applications, notification must be made as soon as practical.

12. **Bonus:** Teachers incorporate school grounds IPM or general IPM concepts into curricula and/or class projects.

**Section 2. Inspection, Exclusion and Sanitation**

1. A written IPM inspection checklist or form is used for periodic inspections, listing each landscape feature (e.g., lawns, playing fields, walkways, driveways, etc.) to be inspected, including specific locations within features (e.g., retaining walls) to be covered in the inspection and specific conditions to be noted (e.g., repair, cleaning needs).

2. Monitoring traps, plant phenology and/or growing degree days are used to predict pest activity and schedule monitoring activities.

3. Pest management roles communicated to staff and students include proper disposal of food or food wrappers.

4. Litter is collected and properly disposed of from school grounds at least weekly.

5. **Bonus:** Food and beverages are allowed only in limited designated areas.

6. Outdoor garbage containers and storage are placed away from building entrances.

7. Outdoor garbage containers are emptied frequently to prevent accumulated trash from blocking door closure.

8. Outdoor garbage containers, dumpsters, compactors and storage are placed on hard, cleanable surfaces.

9. Outdoor garbage containers have spring-loaded lids to exclude pests.

10. Outdoor garbage containers are washed on at least a monthly basis, including spill-contaminated areas around containers.

11. Cracks and crevices in paved areas are corrected.

12. Stored waste is collected and moved off site at least once weekly.

13. **Bonus:** Stored waste is collected and moved off site at least twice
weekly.

14. Recyclables are collected and moved off site at least weekly.

15. **Bonus:** Recyclables are collected and moved off site at least **twice** weekly.

**Section 3. Pest and Pesticide Risk Management**

1. **Priority:** When pest problems requiring action occur, appropriate lesser risk options are used first.

2. **Priority:** All pesticide application equipment is calibrated at the start of each season. Records (date, calibrator, etc.) are maintained for 3 years.

3. **Priority:** Pesticide and fertilizers are loaded into application equipment over a hard surface where spills can be promptly and thoroughly contained and cleaned without danger of spill leaching into soil or runoff into soil, drains or sewers.

4. All pesticide application equipment is re-calibrated at mid-season.

5. Pesticide applications are limited to affected areas, plants or plant parts rather than treating an entire management unit, group of plants or entire plant, respectively, as per monitoring results (e.g., one corner of a lawn is treated for grubs, or one shrub or portion of a shrub is treated).

6. When effective control can be achieved at reduced rates, pesticide applications are made at less than the maximum labeled rate.

7. Where appropriate (e.g., herbicide applications), a colorant is used to mark the treated area.

8. If baits or traps of any kind are used:
   a) a map or floor plan of each area where baits or traps are located is prepared;
   b) each bait station or trap is numbered and entered on the map;
   c) they are marked with appropriate warning language; and
   d) checked at least once per month.
   
   _If pests are managed effectively without baits or traps, score as N/A._

9. Inventory is managed to track current stock, use and ensure proper disposal of unused materials and empties. _If pesticide inventories are not maintained by the school, score as N/A._

10. **Bonus:** Least-Risk Options are the only pest controls used.

11. **Bonus:** No pesticides are stored on school grounds.
12. **Bonus:** Action thresholds for pesticide applications correspond with pest pressure sufficient to cause physiological injury, not aesthetic injury.

13. **Bonus:** Teachers incorporate pest and pesticide risk management into curricula and/or class projects.

**Total MODULE THREE Administration and Policy IPM Points Available** 375

**Total Points Not Applicable**

**Total MODULE THREE Administration and Policy IPM Points Earned**

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**Note items requiring additional action:**

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Note items requiring additional action (continued):
MODULE THREE: Plant and Pest-Specific IPM Practices for School Grounds

Section 4. Landscape Plant Cultural Management

[ ] NOT APPLICABLE (Check here if landscape plants requiring management are not present on your school grounds and proceed to Section 35, Turf Management)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At least a rough landscape plant map is prepared:</td>
<td></td>
</tr>
<tr>
<td>a) noting locations of trees, shrubs and ornamentals;</td>
<td>5</td>
</tr>
<tr>
<td>b) dividing the landscape into management units; and</td>
<td>5</td>
</tr>
<tr>
<td>c) copies of the map are updated annually, noting soil fertility tests, pest problems and key plants.</td>
<td>10</td>
</tr>
<tr>
<td>2. Landscape plants are scouted at least monthly during the growing season for conditions requiring action (e.g., damaged, diseased, dead limbs; soil erosion/compaction; insect, disease, weed pests and damage).</td>
<td>20</td>
</tr>
<tr>
<td>3. Scouting follows a regular pattern to ensure all plantings are checked.</td>
<td>10</td>
</tr>
<tr>
<td>4. Corrective actions are identified and a timeline is established for implementation.</td>
<td>10</td>
</tr>
<tr>
<td>5. Scouting results, corrective actions and evaluations of results are noted legibly in writing and these records are maintained for at least three years.</td>
<td>10</td>
</tr>
<tr>
<td>6. Soil in landscape plantings is tested at least every five years for nitrogen, phosphorus, potassium and pH.</td>
<td>10</td>
</tr>
<tr>
<td>7. Fertilizers and other soil amendments are applied according to soil and/or plant foliage test results, not on a routine or regularly scheduled basis.</td>
<td>10</td>
</tr>
<tr>
<td>8. Identifying soil compaction is part of regular monitoring and problem areas are corrected.</td>
<td>10</td>
</tr>
<tr>
<td>9. Irrigation of established plants is scheduled according to need and anticipated weather, not on a routine or regularly scheduled basis. If soil moisture is managed effectively without irrigation, score as N/A.</td>
<td>10</td>
</tr>
<tr>
<td>10. Key plants in the landscape are scouted more frequently during critical times of year (i.e., around key pest emergence, egglaying, etc.).</td>
<td>10</td>
</tr>
<tr>
<td>11. Signs of erosion are minimal.</td>
<td>5</td>
</tr>
<tr>
<td>12. When renovating, adding new plants or establishing new landscape areas, plant species are selected to address site-specific growing conditions (e.g., tolerance to key pests, pH levels, soil type, light levels, hardiness zone, annual rainfall, etc.).</td>
<td>5</td>
</tr>
</tbody>
</table>

Landscape Plant Cultural Management

Published by The IPM Institute of North America, Inc., 1914 Rowley Ave., Madison WI 53726
(608) 232-1528, FAX (608) 232-1530, E-mail ipminstitute@ipminstitute.org, Web site: http://www.ipminstitute.org
13. Plant spacing is adequate to ensure sufficient light, nutrients and water. 5

14. When renovating, changes in grade or drainage around established trees are avoided unless necessary to correct an existing problem. 5

15. In temperate areas, fertilizers are not applied after mid-summer or before complete dormancy to avoid delaying dormancy. 5

16. Perennial beds are mulched to conserve soil moisture, improve organic matter, reduce compaction and moderate soil temperature. 10

17. The root zones of trees and shrubs are mulched. 10

18. Mulch is prevented from contact with buildings (>12 inches away). 5

19. Plant debris and leaves are not permitted to accumulate on paved areas (e.g., on sidewalks, parking areas, road and driveways) to avoid movement into sewer systems and surface water bodies. 10

20. Fertilizer applications are split (e.g., one in spring and one in fall) rather than one single heavy application. 5

21. When fertilizers are applied, they are watered into the soil to reduce wind or rain-induced movement from the site. 5

22. When fertilizers are needed, slow-release forms of nitrogen are used. 5

23. Irrigation is scheduled to minimize the amount of time leaves remain wet to reduce opportunities for disease development (i.e., plant foliage is dry before nightfall). If soil moisture is managed effectively without irrigation, score as N/A. 5

24. Irrigation is allowed to drain before heavy foot or vehicle traffic is permitted in planted areas to minimize compaction. If soil moisture is managed effectively without irrigation, score as N/A. 5

25. Drip irrigation is used for annual beds and/or high priority/demand beds. If soil moisture is managed effectively without irrigation, score as N/A. 5

26. Key plants in the landscape are removed and replaced with plants less susceptible to pest problems. 5

27. There are no visible signs of erosion on school grounds. 5

28. **Bonus:** Pest Manager can identify the landscape plants present on school grounds. 10

| Total Points Available for Landscape Plant Cultural Management | 220 |
| Total Points Not Applicable | ____ |
| Total Points Earned for Landscape Plant Cultural Management | ____ |
Resources for Landscape Plant Cultural Management


Fare, D., 1999. Chapter 3. Planting, establishment and pruning of woody ornamentals, pp. 3.1 to 3.29; and M. Albrecht, Chapter 4. IPM for flower gardens, pp. 4.1 to 4.6. In Integrated Pest Management of Landscapes, Vail and Croker, eds. University of Tennessee Agricultural Extension Service Publication No. PB1639. Line drawings, plant selection and placement, pruning notes for more than 75 species; soil preparation for flowering plants, fertilization and mulching. Available from Mail and Supply Office, University of Tennessee, Knoxville TN. Phone (865) 974-7300, Fax (865) 974-2713.


Know Your Plants

"Before you can properly care for the trees and shrubs on your school grounds, you must know what they are. Make a map of the grounds and identify every tree and shrub. You should be able to answer the following questions:

- What kind of soil does the plant prefer?
- How much water does it need?
- When should it be fertilized?
- How should it be pruned?
- Does it prefer shade or sun?
- How much heat or cold can it tolerate?
- What are its most common pest problems?
- What environmental problems is it susceptible to (soil compaction, air pollution, salt damage, etc.)?"

- Excerpt from Daar et al. 1997
About Key Plants

“Key plants are those plants that provide aesthetic or functional attributes to the landscape's value or are more likely to suffer from serious, annual problems that will dominate your control practices. These are plants that will require more time and money to maintain. There are 10 groups of woody landscape plants that can be considered key plants: birch, crabapples, dogwoods, euonymus, junipers, maples, oaks, pines, flowering plums, and any plant in the rose family.”

- Excerpt from Stier et al. 1999 (Note: Key plants and groups will vary by region.)

Notes:
### Landscape Plant Disease and Nematode Pests

#### Section 5. Canker Diseases

[ ] NOT APPLICABLE *(Check here if canker diseases are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for problem canker diseases are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When canker problems occur, the disease is identified correctly before taking action. Actions are appropriate for the disease.</td>
<td>20</td>
</tr>
<tr>
<td>3. When canker problems occur, contributing factors are identified and corrected (e.g., avoid injury to bark, moderate fertilizer rates and use slow-release forms, irrigate to maintain vigor, prune out affected plant parts as soon as they appear, prune out any dead and dying branches on a regular basis, replace susceptible plants, sterilize pruning tools after use on affected plants).</td>
<td>20</td>
</tr>
<tr>
<td>4. When canker disease problems occur on landscape trees, the affected tree is evaluated as a potential hazard and corrective action is taken as needed (e.g., bracing, pruning, removal).</td>
<td>20</td>
</tr>
<tr>
<td>5. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for canker disease management.</td>
<td>10</td>
</tr>
<tr>
<td>6. Landscape maintenance personnel are provided with training at least annually to recognize and report canker problems.</td>
<td>10</td>
</tr>
<tr>
<td>7. <strong>Bonus:</strong> Pest Manager can identify on sight symptoms of problem canker diseases common to the region and to plants present on the school grounds (e.g., Black Knot, Botryosphaeria Canker, Cytospora Canker, Cypress Canker, Dogwood Canker, Foamy Canker, Phomopsis Canker, Pink Rot, Volutella Canker, Wetwood).</td>
<td>10</td>
</tr>
<tr>
<td>8. Least-Risk Options are the only methods used for canker diseases.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Canker Disease Management** 105

**Total Points Earned for Canker Disease Management**

**Notes:**

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Landscape Disease & Nematode Pests

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Section 6. Leafspots & Blights

[ ] NOT APPLICABLE (Check here if leafspots and blights are not a problem requiring action at your school and proceed to the next section.)

Points Available Points Earned

Common Key Pests on School Grounds

1. **Priority:** Action thresholds for problem leafspots and blights are defined in the IPM Plan and effectively implemented. 20

2. When leafspot or blight problems occur, the disease is identified correctly before taking action. Actions are appropriate for the disease. 20

3. When leafspot and blight problems occur, contributing factors are identified and corrected (e.g., avoid overhead irrigation; prune out and destroy infected twigs during dormant months; reduce humidity around susceptible plants by proper weed management, spacing and pruning; remove infected leaves and destroy as soon as they are noticed; replace susceptible plants; schedule irrigation so that foliage dries quickly). For Fire Blight, remove infected twigs and branches during dry weather as soon as they appear and sterilize pruners between cuts. 20

4. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for leafspot and blight management. 5

5. Landscape maintenance personnel are provided with training at least annually to recognize and report leafspot and blight problems. 10

6. **Bonus:** Pest Manager can identify on sight symptoms of problem leafspots and blights common to the region and to the plants present on the school grounds (e.g., Anthracnose, Apple Scab, Entomosporium Leaf Spot, Fire Blight, Gray Leaf Spot, Oak Twig Blight, Powdery Mildew, Schaeropsis Blight, Septoria Leaf Spot, Shothole). 10

7. Least-Risk Options are the only methods used for leafspots and blights. 5

Total Points Available for Leafspot and Blight Management 80

Total Points Earned for Leafspot and Blight Management

Notes:
Section 7. Nematodes

[ ] NOT APPLICABLE (Check here if nematodes are not a problem requiring action at your school and proceed to the next section.)

1. **Priority:** Action thresholds for problem nematodes are defined in the IPM Plan and effectively implemented.

   Points Available: 20
   Points Earned: _______

2. When nematode problems are suspected, soil samples (or branch samples for Pinewood Nematode) are sent to a lab for identification. Actions are appropriate for the nematode.

   Points Available: 20
   Points Earned: _______

3. When nematode problems occur, contributing factors are identified and corrected (e.g., avoid replanting susceptible plants into infested soil, buy and plant only nematode-free stock, clean tools and equipment after working in infested soil, do not allow irrigation water from infested soil to runoff onto clean soil, moderate fertilizer rates and use slow-release forms, increase soil organic matter, irrigate to maintain vigor, replace susceptible plants, use only fully composted or sterilized soil amendments when planting). For Pinewood Nematode, remove infected trees and destroy wood before nematodes and the Pine Sawyer vector disperses to healthy trees.

   Points Available: 20
   Points Earned: _______

4. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for nematode management.

   Points Available: 5
   Points Earned: _______

5. Landscape maintenance personnel are provided with training at least annually to recognize and report nematode problems.

   Points Available: 10
   Points Earned: _______

6. **Bonus:** Pest Manager can identify on sight symptoms of problem nematodes common to the region and to the plants present on the school grounds (e.g., Citrus, Dagger, Pin, Pinewood, Ring, Root Knot, Root Lesion, Stunt Nematodes).

   Points Available: 10
   Points Earned: _______

7. Least-Risk Options are the only methods used for nematodes.

   Points Available: 5
   Points Earned: _______

**Total Points Available for Nematode Management:** 80

**Total Points Earned for Nematode Management:** _______

Notes:
Section 8. Root & Crown Diseases

[ ] NOT APPLICABLE (Check here if root and crown diseases are not a problem requiring action at your school and proceed to the next section.)

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority: Action thresholds for problem root and crown diseases are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2. When root or crown disease problems occur, the disease is identified correctly before taking action. Actions are appropriate for the disease.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>3. When root and crown disease problems occur, contributing factors are identified and corrected (e.g., improve drainage, incorporate pine bark or other materials into poorly drained soils prior to planting, moderate irrigation rates, plant into raised beds in poorly drained areas, prevent mower/weed trimmer injury by replacing sod at base of plant with mulch, reduce compaction, replace susceptible plants).</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4. When root and crown disease problems occur on landscape trees, the affected tree is evaluated as a potential hazard and corrective action is taken as needed (e.g., bracing, removal).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5. Priority: Reduced-Risk or Least-Risk Options are the only methods used for root and crown disease management.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6. Landscape maintenance personnel are provided with training at least annually to recognize and report root and crown disease problems.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7. Bonus: Pest Manager can identify on sight symptoms of problem root and crown disease common to the region (e.g., Armillaria Root Rot; damping-off diseases; Phytophthora collar, foot, root and crown rots; Shoestring Root Rot).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8. Least-Risk Options are the only methods used for root and crown disease.</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Total Points Available for Root and Crown Disease Management 90

Total Points Earned for Root and Crown Disease Management

Notes:
### Section 9. Rusts

[ ] **NOT APPLICABLE** *(Check here if rusts are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for problem rusts are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When rust problems occur, the disease is identified correctly before taking action. Actions are appropriate for the disease.</td>
<td>20</td>
</tr>
<tr>
<td>3. When rust problems occur, contributing factors are identified and corrected (e.g., avoid overhead watering, eliminate alternate hosts, prune out infected plant parts immediately, replace susceptible plants).</td>
<td>20</td>
</tr>
<tr>
<td>4. When gall rust disease problems occur on landscape tree trunks or major limbs, the affected tree is evaluated as a potential hazard and corrective action is taken as needed (e.g., bracing, pruning, removal).</td>
<td>10</td>
</tr>
<tr>
<td>5. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for rust management.</td>
<td>5</td>
</tr>
<tr>
<td>6. Landscape maintenance personnel are provided with training at least annually to recognize and report rust problems.</td>
<td>10</td>
</tr>
<tr>
<td>7. <strong>Bonus:</strong> Pest Manager can identify on sight symptoms of problem rusts common to the region and to plants on school grounds (e.g., Cedar-Apple Rust, Cedar-Hawthorne Rust, Gall Rusts, Red Pine Needle Rust, Western Gall Rust, White Pine Blister Rust).</td>
<td>10</td>
</tr>
<tr>
<td>8. Least-Risk Options are the only methods used for rusts.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Rust Management** 90
**Total Points Earned for Rust Management**

### Section 10. Virus Diseases

[ ] **NOT APPLICABLE** *(Check here if virus diseases are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Action thresholds for problem virus diseases are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When virus disease problems occur, contributing factors are identified and corrected (e.g., replace infected plants with certified virus-free stock, replace susceptible plants).</td>
<td>20</td>
</tr>
<tr>
<td>3. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for virus disease management.</td>
<td>5</td>
</tr>
<tr>
<td>4. Landscape maintenance personnel are provided with training at least annually to recognize and report virus disease problems.</td>
<td>10</td>
</tr>
<tr>
<td>5. <strong>Bonus:</strong> Pest Manager can identify on sight symptoms of problem virus diseases common to the region and to the plants on school grounds (e.g., mosaic viruses, mottle viruses, ringspot viruses).</td>
<td>10</td>
</tr>
<tr>
<td>6. Least-Risk Options are the only methods used for virus diseases.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Virus Disease Management** 60
**Total Points Earned for Virus Disease Management**
### Section 11. Wilts

[ ] NOT APPLICABLE  *(Check here if wilts are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for problem wilts are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When wilt problems occur, the disease is identified correctly before taking action. Actions are appropriate for the disease.</td>
<td>20</td>
</tr>
<tr>
<td>3. When wilt problems occur, contributing factors are identified and corrected (e.g., avoid replanting susceptible plants into infected soil, moderate fertilizer rates and use slow-release forms, irrigate to maintain vigor, prune out affected plant parts as soon as they appear, replace susceptible plants, sterilize pruning tools after use on affected plants, use only fully composted or sterilized soil amendments when planting).</td>
<td>20</td>
</tr>
<tr>
<td>4. When wilt problems occur on landscape trees, the affected tree is evaluated as a potential hazard and corrective action is taken as needed (e.g., bracing, pruning, removal).</td>
<td>10</td>
</tr>
<tr>
<td>5. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for wilt management.</td>
<td>5</td>
</tr>
<tr>
<td>6. Landscape maintenance personnel are provided with training at least annually to recognize and report wilt problems.</td>
<td>10</td>
</tr>
<tr>
<td>7. <strong>Bonus:</strong> Pest Manager can identify on sight symptoms of problem wilts common to the region and to the plants present on the school grounds (Fusarium Wilt, Verticillium Wilt).</td>
<td>10</td>
</tr>
<tr>
<td>8. Least-Risk Options are the only methods used for wilt.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Wilt Management** 90

**Total Points Earned for Wilt Management**

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**Notes:**

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Landscape Plant Disease & Nematode Pests

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### Section 12. Other Landscape Plant Disease Pests

[ ] NOT APPLICABLE  
(*Check here if there are no other landscape plant disease or nematode pests and proceed to the next section.*)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
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<tr>
<td>20</td>
<td></td>
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<td>10</td>
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<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

1. **Priority:** Action thresholds for these additional landscape diseases are defined in the IPM Plan and effectively implemented.

2. When disease problems occur, the disease is identified correctly before taking action. Actions are appropriate for the disease.

3. Contributing factors are identified and corrected. **List here:**

4. When a pesticide is necessary, a spot application is limited to infested plants or plant parts instead of treating a group of plants or entire plant.

5. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for landscape plant disease and nematode pest management.

6. **Bonus:** Pest Manager can identify symptoms of these additional landscape diseases on sight. **List here:**

7. Least-Risk Options are the only methods used for landscape plant disease and nematode pest management.

**Total Points Available for Other Landscape Disease & Nematode Pests** 80

**Total Points Earned for Other Landscape Disease & Nematode Pests**

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**Resources for Landscape Plant Disease and Nematode Pest Management**


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**Landscape Disease & Nematode Pests**

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University of Massachusetts. 2001. Diseases. Over ten fact sheets intended to help the green industry professional identify the cause of a plant disease or disorder, and decide whether alternative plant choices, sanitation, modification of the growing environment, chemical controls or a combination would best address their particular situation. http://www.umassgreeninfo.org/fact_sheets/diseases.html.


Notes:
### Landscape Plant Insect & Mite Pests

#### Section 13. Bark, Trunk & Twig Borers

[ ] NOT APPLICABLE  *(Check here if borers are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority: Action thresholds for key borer pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2. When borer problems occur, the pest is identified correctly before taking action. Actions are appropriate for the pest.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>3. Inspection routines are appropriate to the problem pest <em>(e.g., monitor the base of the trunk of Prunus varieties for cracked bark, frass and gomosis for Peachtree Borer in summer, monitor the crowns of elm trees for dieback and Elm Bark Beetles in May).</em></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4. When borer problems occur, contributing factors are identified and corrected <em>(e.g., mulch around the base of dogwoods to prevent mower injury; correct drainage; irrigate near the outer portion of the canopy rather than near the trunk to avoid softening bark; prune out and destroy infested branches; remove freshly cut or fallen wood to avoid harboring borers; replace susceptible, stressed or dying plants).</em></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>5. Actions are taken at the appropriate time for the specific pest and action <em>(e.g., use degree days and/or pheromone traps to determine best time to monitor and manage clearwing borers, Nantucket Pine Tip Moth).</em></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6. When a pesticide is necessary, a spot application is limited to infested plants or plant parts instead of treating a group of plants or entire plant. <em>(e.g., treat root crown for Peachtree Borer; treat tree trunks and not foliage for Southern Pine Beetle; treat terminals for Nantucket Pine Tip Moth, White Pine Weevil). If borers are managed effectively without insecticides, score as N/A.</em></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7. Priority: Reduced-Risk or Least-Risk Options are the only methods used for borer management.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>8. Landscape maintenance personnel are provided with training at least annually to recognize and report borer problems.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>9. Bonus: Pest Manager can identify problem borers common to the region on sight <em>(e.g., Bronze Birch Borer, Cottonwood Borer, Dogwood Borer, Elm Bark Beetle, Flatheaded Apple Tree Borer, Lilac Borer, Locust Borer, Nantucket Pine Tip Moth, Peachtree Borer, Rhododendron Borer, Southern Pine Beetle, Twolined Chestnut Borer, White Pine Weevil, etc.).</em></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10. Least-Risk Options are the only methods used for borer management.</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Total Points Available for Bark, Trunk and Twig Borer Management** 110

**Total Points Not Applicable**

**Total Points Earned for Bark, Trunk and Twig Borer Management**
### Section 14. Caterpillars

[ ] NOT APPLICABLE  *(Check here if caterpillars are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Common Key Pests on School Grounds</th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for key caterpillar pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2. When caterpillar problems occur, the pest is identified correctly before taking action. Actions are appropriate for the pest.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>3. When caterpillar problems occur, contributing factors are identified and corrected (e.g., avoid pesticides toxic to beneficials, replace susceptible plants).</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4. Inspection routines are appropriate to the problem pest (e.g., monitor the bark of oak and other susceptible plants for Gypsy Moth egg masses in fall and winter; monitor foliage of ash, birch, fruit and nut trees and other susceptible plants for tent caterpillars and webbing tents in spring).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5. Action thresholds are appropriate to the problem species, plant age and growth stage (i.e., accept a higher level of defoliation in the summer vs. spring, or on established plants vs. young plants).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6. Actions are taken at the appropriate time (e.g., prune out and destroy tent caterpillar webbing and infested branches before substantial defoliation occurs; apply <em>Bacillus thuriengensis</em> to susceptible young caterpillars).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7. When a pesticide is necessary, a spot application is limited to infested plants or plant parts instead of treating a group of plants or entire plant. <em>If caterpillars are managed effectively without pesticides, score as N/A.</em></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for caterpillar management.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>9. Landscape maintenance personnel are provided with training at least annually to recognize and report caterpillar problems.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10. <strong>Bonus:</strong> Pest Manager can identify problem caterpillars common to the region on sight (e.g., Azalea Caterpillars, Bagworms, Cankerworms, Eastern and Forest Tent Caterpillars, European Pine Shoot Moth, Fall Webworm, Fruittree Leafroller, Gypsy Moth, Omnivorous Looper, Orangestriped Oakworm, Poplar Tentmaker, Redhumped Caterpillar, Tussock Moth, Walnut Caterpillar, etc.).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11. Least-Risk Options are the only methods used for caterpillar management.</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Total Points Available for Caterpillar Management** 120

**Total Points Not Applicable**

**Total Points Earned for Caterpillar Management**
## Section 15. Leaf Beetles & Weevils

<table>
<thead>
<tr>
<th></th>
<th>Priority: Action thresholds for key leaf beetle and weevil pests are defined in the IPM Plan and effectively implemented.</th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>When leaf beetle or weevil problems occur, the pest is identified correctly before taking action. Actions are appropriate for the pest.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>When leaf beetle and weevil problems occur, contributing factors are identified and corrected (e.g., replace susceptible plants).</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Inspection routines are appropriate to the problem pest (e.g., monitor Black Vine Weevils with pitfall traps or burlap trunk bands, monitor leaves for notching, and/or monitor plants at night for feeding weevils; monitor growing terminals for eggs of Elm Leaf Beetles).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Action thresholds are appropriate to the problem species, plant age and growth stage (i.e., accept a higher level of defoliation in the summer vs. spring or on established plants vs. young plants).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Actions are taken at the appropriate time for the specific pest and action (e.g., apply parasitic nematodes for Black Vine Weevil only when weevil larvae or pupae are present).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>When a pesticide is necessary, a spot application is limited to infested plants or plant parts instead of treating a group of plants or entire plant (e.g., apply insecticide in a band around the tree trunk above the reach of children for Elm Leaf Beetle). If leaf beetles and weevils are managed effectively without pesticides, score as N/A.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Reduced-Risk or Least-Risk Options are the only methods used for leaf beetle and weevil management.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Landscape maintenance personnel are provided with training at least annually to recognize and report leaf beetle and weevil problems.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Pest Manager can identify problem leaf beetles and weevils common to the region on sight (e.g., Black Vine Weevil, Cottonwood Leaf Beetle, Elm Leaf Beetle, Japanese Beetle, Rose Chafer, Strawberry Root Weevil, Twobanded Japanese Weevil, etc.).</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Least-Risk Options are the only methods used for leaf beetles and weevils.</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Total Points Available for Leaf Beetle and Weevil Management** 120

**Total Points Earned for Leaf Beetle and Weevil Management**

[ ] NOT APPLICABLE (Check here if sap-feeding pests are not a problem requiring action at your school and proceed to the next section.)

<table>
<thead>
<tr>
<th>Common Key Pests on School Grounds</th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Priority:</strong> Action thresholds for key sap-feeding pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td>________</td>
</tr>
<tr>
<td><strong>2.</strong> When sap-feeding pest problems occur, the pest is identified correctly before taking action. Actions are appropriate for the pest.</td>
<td>20</td>
<td>________</td>
</tr>
<tr>
<td><strong>3.</strong> When sap-feeding pest problems occur, contributing factors are identified and corrected (e.g., discontinue use of pesticides toxic to beneficials, exclude ants from plants, manage adjacent weed hosts, reduce fertilizer rates to moderate shoot growth, use slow-release forms of nitrogen fertilizer, replace susceptible plants with resistant plants, and/or reduce plant stress by mulching, relocating out of full sun or irrigating).</td>
<td>20</td>
<td>________</td>
</tr>
<tr>
<td><strong>4.</strong> Inspection routines are appropriate to the problem pest (e.g., monitor hemlock twigs for Hemlock Wooly Adelgid egg sacs in spring and fall, monitor undersides of leaves for Twospotted Spider Mites and mite predators, monitor growing terminals for aphids and aphid predators).</td>
<td>10</td>
<td>________</td>
</tr>
<tr>
<td><strong>5.</strong> Beneficials are also sampled, and insecticides, if used, are not applied if beneficials are present in sufficient numbers to provide control.</td>
<td>10</td>
<td>________</td>
</tr>
<tr>
<td><strong>6.</strong> When a pesticide is necessary, a spot application is limited to infested plants or plant parts instead of treating a group of plants or entire plant. <strong>If sap-feeding pests are managed effectively without pesticides, score as N/A.</strong></td>
<td>10</td>
<td>________</td>
</tr>
<tr>
<td><strong>7. Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for sap-feeding pest management.</td>
<td>5</td>
<td>________</td>
</tr>
<tr>
<td><strong>8.</strong> Landscape maintenance personnel are provided with training at least annually to recognize and report sap-feeding pest problems.</td>
<td>10</td>
<td>________</td>
</tr>
<tr>
<td><strong>9. Bonus:</strong> Pest Manager can identify problem aphid, adelgid, mealybug and mites species and major predators and parasites common to the region on sight (e.g., Boxwood Psyllid, Eriophyid Mites, Euonymus Scale, Hemlock Wooly Adelgid, Longtailed Mealybug, Oystershell Scale, Pine Bark Adelgid, Privet Rust Mite, San Jose Scale, Southern Red Mite, Striped Mealybug, Twospotted Spider Mite, Wax Scale, White Pine Aphid, White Peach Scale, Wooly Apple Aphid, etc.)</td>
<td>10</td>
<td>________</td>
</tr>
<tr>
<td><strong>10.</strong> Least-Risk Options are the only methods used for sap-feeding pest management.</td>
<td>5</td>
<td>________</td>
</tr>
</tbody>
</table>

**Total Points Available for Sap-Feeding Pest Management** 110

**Total Points Earned for Sap-Feeding Pest Management** 110
## Section 17. Sawflies

[ ] NOT APPLICABLE *(Check here if sawflies are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for key sawfly pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When sawfly problems occur, the pest is identified correctly before taking action. Actions are appropriate for the pest.</td>
<td>20</td>
</tr>
<tr>
<td>3. When sawfly problems occur, contributing factors are identified and corrected (e.g., correct drainage, irrigate to relieve drought stress, replace susceptible plants).</td>
<td>20</td>
</tr>
<tr>
<td>4. Susceptible plants are visually inspected for problem sawflies (i.e., eggs, larvae or feeding damage) in the proper location at the appropriate time of year (e.g., monitor Eastern White Pine branches for defoliation and clusters of White Pine Sawfly larvae in spring and early fall, monitor roses in late spring for skeletonized leaves and the upper sides of those leaves for Rose Slug larvae, monitor oak tree crowns in summer for defoliation from oak sawflies).</td>
<td>10</td>
</tr>
<tr>
<td>5. Action thresholds are appropriate to the problem species, plant age and growth stage (i.e., accept a higher level of defoliation in the fall vs. spring, or on established plants vs. young plants).</td>
<td>10</td>
</tr>
<tr>
<td>6. When a pesticide is necessary, a spot application is limited to infested plants or plant parts instead of treating a group of plants or entire plant. <em>If sawflies are managed effectively without pesticides, score as N/A.</em></td>
<td>10</td>
</tr>
<tr>
<td>7. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for sawfly management.</td>
<td>5</td>
</tr>
<tr>
<td>8. Landscape maintenance personnel are provided with training at least annually to recognize and report sawfly problems.</td>
<td>10</td>
</tr>
<tr>
<td>9. <strong>Bonus:</strong> Pest Manager can identify problem sawflies common to the region on sight (e.g., Cyprus Sawfly, Dusky Birch Sawfly, Mountain-Ash Sawfly, Pin Oak Sawfly, Pearslug, Redheaded Pine Sawfly, Rose Slug, Slug Oak Sawfly, White Pine Sawfly, etc.).</td>
<td>10</td>
</tr>
<tr>
<td>10. Least-Risk Options are the only methods used for sawfly management.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Sawfly Management** 110

**Total Points Not Applicable** 110

**Total Points Earned for Sawfly Management** 110
Section 18. Other Landscape Plant Insect & Mite Pests

[ ] NOT APPLICABLE (Check here if there are no other landscape plant insect or mite pests requiring action at your school and proceed to the next section.)

1. Action thresholds for additional key landscape plant insect and mite pests are defined in the IPM Plan and effectively implemented. 20

2. When problems occur, the pest is identified correctly before taking action. Actions are appropriate for the pest. 20

3. Contributing factors are identified and corrected. List here: 20

4. When a pesticide is necessary, a spot application is limited to infested plants or plant parts instead of treating a group of plants or entire plant. If these pests are managed effectively without pesticides, score as N/A. 10

5. Priority: Reduced-Risk or Least-Risk Options are the only methods used for landscape plant insect and mite pest management. 5

6. Bonus: Pest Manager can identify these additional landscape insect and mite pests and beneficial organisms on sight. List here: 10

7. Least-Risk Options are the only methods used for landscape plant insect and mite management. 5

Total Points Available for Other Landscape Insect or Mite Pest Mgt. 80
Total Points Not Applicable
Total Points Earned for Other Landscape Insect and Mite Pest Mgt.
Resources for Landscape Plant Insect and Mite Pest Management

Brown-Rytlewski, Diane. 2002. Pocket IPM Scouting Guide for Woody Landscape Plants. Plastic-coated scouting guide with its 3.5” X 6.0” pages designed to fit in your pocket for easy field use. Color pictures and descriptions to identify common pests and their damage, beneficials, common diseases, injury caused by deer, voles and rabbits, and abiotic plant injury. Guidelines for scouting and management are also given. For more information, or to order, visit http://www.msue.msu.edu/ipm/LandscapePocket.htm.


Hale, F., K. Vail, M. Raupp and J. Davidson. 1999. Chapter 5. Insect and mite pests of ornamentals, pp. 5.1 to 5.65. In Integrated Pest Management of Landscapes, Vail and Croker, eds. University of Tennessee Agricultural Extension Service Publication No. PB1639. Seasonal key pest list for common woody ornamentals; line drawings, description, host plants, damage, monitoring and management for 139 common ornamentals pests. Available from Mail and Supply Office, University of Tennessee, Knoxville TN. Phone (865) 974-7300, Fax (865) 974-2713.


Action Thresholds for Leaf-Feeding Insects

Suggested action thresholds for caterpillar or leaf beetle damage to healthy, mature deciduous landscape plants are approximately 20% defoliation in the spring, and 30% to 40% in the summer. In the fall, it is generally inappropriate to control these pests on deciduous plants, since the leaves will soon be shed.

Exceptions can include young plants, plants suffering from drought or other stresses, or specific pests. For example, even slight feeding damage from Black Vine Weevil adults can indicate a potential problem for young plants, due to root feeding from larvae concealed in the soil.

- Source: Dreistadt et al., 1994
University of Massachusetts. 2001. Insects and Mites. Most fact sheets contained in this site are originally from the CD-ROM "Tree Bytes" (1998), which contains nearly 120 insect and mite fact sheets along with more than 40 disease entries, and approximately 700 color photographs. http://www.umassgreeninfo.org/fact_sheets/insectsandmites.html

University of Minnesota. 2003. IPM of Midwest Landscapes. Cooperative project with the NCR-193 North Central Committee on Landscape IPM. Includes information on tree, shrub and turf pests. Many topics included in this publication are applicable beyond the Midwest region. For more information on this publication, please visit the website located at http://www.entomology.umn.edu/cues To order, download the order form on the web site. With questions, contact Susan Ratcliffe via email or by phone at (217) 333-9656 and sratclif@uiuc.edu.

Notes:
**Turf Management**

Section 19. Turf Cultural Management

[ ] NOT APPLICABLE (Check here if turf is not present at your school and proceed to Section 53. Vertebrate Pests)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

1. At least a rough map is prepared:
   a) noting locations of turf areas;  
   b) dividing these into management units/grids; and  
   c) copies of map are updated annually noting soil tests, fertilizer applications and pest and other problems (e.g., erosion, compaction).

2. High profile/high traffic turf areas are scouted at least monthly during the growing season for divots, bare areas, insect, disease and weed pests and damage, etc.

3. **Bonus:** Turf is scouted at least every other week during the growing season.

4. A serpentine or other regular pattern is used to ensure that all areas of the turf are covered.

5. Problem turf areas identified in the IPM Plan are scouted more frequently during critical periods (i.e., around key pest emergence, egglaying, etc.).

6. Corrective actions are identified and a timeline is established for implementation.

7. Scouting results, corrective actions and evaluation of results are noted legibly in writing and these records are maintained for at least three years.

8. Identifying soil compaction is part of regular monitoring and problem areas are corrected.

9. Mowing height is set as high as practical to maximize shading and prevent weed growth and adjusted according to weather conditions, growth rate of the grass and the variety of turf.

10. Any one mowing removes 1/3 or less of leaf tissue.

11. Mower blades are kept sharp to ensure a clean cut.

12. Grass clippings are generally not removed. If wet and clumpy, grass clippings are re-mowed or removed and composted.

13. After mowing, grass clippings are removed from paved areas (e.g., sidewalks, parking areas, road and driveways) and composted or otherwise properly disposed of to avoid movement into sewer systems.
14. Thatch accumulation is monitored and corrected if excessive (> 1.25").

15. Soil is tested at least every five years for phosphorus, potassium and pH.

16. Fertilizers and other soil amendments are applied according to soil and/or plant foliage test results, not on a routine or regularly scheduled basis (except for nitrogen, which may be applied on a scheduled basis).

17. Fertilizers are applied several times (e.g., spring, summer, fall) rather than one single heavy application.

18. When fertilizers are applied, they are watered into the soil to reduce wind or rain-induced movement from the site.

19. When fertilizers are needed, at least 35% of the total annual nitrogen is in slow-release form to reduce pest flareups due to flushes of nitrogen.

20. **Bonus:** Fertilizers are selected to include those that may promote thatch decomposition (e.g., composted organic materials).

21. Irrigation is scheduled according to need and anticipated weather, not on a routine or regularly scheduled basis. Athletic fields may be irrigated on a scheduled basis that is adjusted for rainfall to ensure adequate moisture for recovery and growth.

22. When irrigation is applied, it is sufficient to wet the entire turf root zone to reduce shallow rooting, but may be split to allow infiltration and avoid runoff. Exceptions are made for specific disease pressure (e.g., summer patch) dictating more frequent and less deep irrigations.

23. If moisture-dependent turf diseases are a problem (e.g., pythium, rhizoctonia blight, rusts), irrigation is scheduled to minimize the amount of time grass blades remain wet to reduce opportunities for disease development (i.e., turf is dry before nightfall).

24. Bare soil patches in turf areas are addressed promptly by correcting the underlying cause (e.g., excessive traffic, inappropriate seed mix, poor drainage) before reseeding.

25. When renovating, planting new turf or overseeding, seed mixes are selected to address site-specific growing conditions (e.g., cool vs. warm-season, endophyte enhancements, tolerance to key pests, tolerance to levels of shading and annual rainfall, etc.). Non-essential traffic on athletic fields (e.g., band, phys ed) is adjusted as needed to allow repair.

26. Soil compaction is minimized by:
   a) rotating mowing patterns;
   b) using flotation tires on equipment;
c) periodic topdressing and/or aeration; and/or 5

d) restricting foot and equipment traffic when soil is overly wet due to irrigation or heavy rain. 5

27. Core cultivation uses hollow tines at least 3” long and is scheduled when soil moisture is adequate to pull cores but dry enough to avoid ruts and compaction from equipment. Core cultivators are of the type that do not add to compaction. If turf aeration, infiltration and compaction are managed adequately without core aeration, score as N/A. 5

28. Turf aeration is timed to avoid periods when heavy seeding weeds (e.g., crabgrass, dandelions) are germinating or setting seeds. 5

29. Topdressing material is free from glass, rocks or other debris and matches the soil type of the root zone as closely as possible. If topdressing is not used, score as N/A. 5

30. **Bonus:** If sand topdressing is used, particle size distribution is close to that specified for U.S. Golf Association putting greens. 5

**Total Points Available for Turf Cultural Management** 240

**Total Points Not Applicable**

**Total Points Earned for Turf Cultural Management**

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**Resources for Turf Cultural Management**


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**Benefits of Healthy Turfgrass**

- Each 25 square feet of turfgrass produces enough oxygen for one person for one day.
- Turf cover reduces rain water runoff and soil erosion.
- A thick, healthy lawn allows 15 times less runoff than poor quality turf.
- Turf builds soil through decomposition of organic matter.
- Turf absorbs greenhouse gases such as carbon dioxide.
- Turf traps pollen and dust for breakdown by soil microbes.
- Turf reduces noise, glare and heat.

- Source: Mugaas et al., 1997.


University of Massachusetts. 2002. Turf IPM Facts. Turf IPM Facts is a packet of over sixty up-to-date fact sheets and is a source of research-based professional lawn care information, with a focus on integrated pest management principles. The individual fact sheets in Turf IPM Facts include information about: key cultural practices for maintaining a healthy and functional lawn, common turf pests and problems, how to manage lawn problems intelligently, using IPM principles and techniques and scouting for problems, identifying problems and creating solutions. Turf IPM Facts is $40 per copy, and can be purchased by contacting the UMass Extension Bookstore, Draper Hall, 40 Campus Center Way, University of Massachusetts, Amherst, MA 01003-9244, phone: (413) 545-2717, fax: (413) 545-5174, books@umext.umass.edu, www.umass.edu/umext/bookstore.

University of Minnesota. 2003. IPM of Midwest Landscapes. Cooperative project with the NCR-193 North Central Committee on Landscape IPM. Includes information on tree, shrub and turf pests. Many topics included in this publication are applicable beyond the Midwest region. For more information on this publication, please visit the website located at http://www.entomology.umn.edu/cues/. To order, download the order form on the web site. With questions, contact Susan Ratcliffe via email or by phone at (217) 333-9656 and sratcliff@uiuc.edu.

**Note items requiring additional action:**

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**About Management Units**

A management unit is an area that is typically treated the same within the area. Dividing landscapes into management units permits more accurate response to site-specific conditions. For example, front lawn and back lawns may have different soil types, shading, slopes, etc. By sampling and testing soil from those areas separately, test results and fertilization will be more precise and give better results.
Turf Disease & Nematode Pest Management

[ ] NOT APPLICABLE (Check here if turf disease and nematode pests are not a problem requiring action at your school and proceed to the Section 47. Turf Insect and Mite Management.)

Section 20. Dollar Spot

[ ] NOT APPLICABLE (Check here if Dollar Spot is not a problem requiring action at your school and proceed to the next section.)

1. **Priority:** Action thresholds for Dollar Spot are defined in the IPM Plan and effectively implemented. 20

2. When Dollar Spot problems occur, contributing factors are identified and corrected (e.g., correct nitrogen deficiency, plant resistant varieties). 20

3. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for Dollar Spot management. 5

4. Turf maintenance personnel are provided with training at least annually to recognize and report Dollar Spot problems. 10

5. **Bonus:** Pest Manager can identify Dollar Spot symptoms on sight. 10

6. Least-Risk Options are the only methods used for Dollar Spot. 5

**Total Points Available for Dollar Spot Management** 60

**Total Points Earned for Dollar Spot Management**

Section 21. Fairy Ring

[ ] NOT APPLICABLE (Check here if Fairy Ring is not a problem requiring action at your school and proceed to the next section.)

1. **Priority:** Action thresholds for Fairy Ring are defined in the IPM Plan and effectively implemented. 20

2. Pesticides are ineffective and not used for Fairy Ring. 20

3. When Fairy Ring problems occur, contributing factors are identified and corrected (e.g., remove buried stumps or wood debris, remove excess thatch). 20

4. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for Fairy Ring management. 5

5. Turf maintenance personnel are provided with training at least annually to recognize and report Fairy Ring problems. 10

6. **Bonus:** Pest Manager can identify Fairy Ring symptoms on sight. 10

7. Least-Risk Options are the only methods used for Fairy Ring. 5

**Total Points Available for Fairy Ring Management** 80

**Total Points Earned for Fairy Ring Management**
### Section 22. Gray Leafspot

[ ] NOT APPLICABLE  *(Check here if Gray Leafspot is not a problem requiring action at your school and proceed to the next section.)*

1. **Priority:** Action thresholds for Gray Leafspot are defined in the IPM Plan and effectively implemented.  
   - Points Available: 20

2. When Gray Leafspot problems occur, contributing factors are identified and corrected (e.g., improve air circulation, reduce nitrogen fertilizer rates during hot and humid weather, reduce shading, schedule irrigation so that grass blades dry quickly after irrigating).  
   - Points Available: 20

3. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for Gray Leafspot management.  
   - Points Available: 5

4. Turf maintenance personnel are provided with training at least annually to recognize and report Gray Leafspot problems.  
   - Points Available: 10

5. **Bonus:** Pest Manager can identify Gray Leafspot symptoms on sight.  
   - Points Available: 10

6. Least-Risk Options are the only methods used for Gray Leafspot.  
   - Points Available: 5

**Total Points Available for Gray Leafspot Management**  60

**Total Points Earned for Gray Leafspot Management**

### Section 23. Leafspot & Melting Out

[ ] NOT APPLICABLE  *(Check here if Leafspot and Melting Out are not a problem requiring action at your school and proceed to the next section.)*

1. **Priority:** Action thresholds for Leafspot and Melting Out are defined in the IPM Plan and effectively implemented.  
   - Points Available: 20

2. When Leafspot and Melting Out problems occur, contributing factors are identified and corrected (e.g., moderate nitrogen fertilizer rates, raise mowing height, diversify monocultures of perennial ryegrass).  
   - Points Available: 20

3. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for Leafspot and Melting Out management.  
   - Points Available: 5

4. Turf maintenance personnel are provided with training at least annually to recognize and report Leafspot and Melting Out problems.  
   - Points Available: 10

5. **Bonus:** Pest Manager can identify Leafspot and Melting Out symptoms on sight.  
   - Points Available: 10

6. Least-Risk Options are the only methods used for Leafspot and Melting Out.  
   - Points Available: 5

**Total Points Available for Leafspot and Melting Out Management**  60

**Total Points Earned for Leafspot and Melting Out Management**
### Section 24. Necrotic Ring Spot/Summer Patch

[ ] NOT APPLICABLE *(Check here if Necrotic Ring Spot/Summer Patch are not problems requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for Necrotic Ring Spot/Summer Patch are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When Necrotic Ring Spot/Summer Patch problems occur, contributing factors are identified and corrected (e.g., avoid moisture stress, moderate fertilizer use to reduce lush soft growth, resistant varieties are planted).</td>
<td>20</td>
</tr>
<tr>
<td>3. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for Necrotic Ring Spot/Summer Patch management.</td>
<td>5</td>
</tr>
<tr>
<td>4. Turf maintenance personnel are provided with training at least annually to recognize and report Necrotic Ring Spot/Summer Patch problems.</td>
<td>10</td>
</tr>
<tr>
<td>5. <strong>Bonus:</strong> Pest Manager can identify Necrotic Ring Spot/Summer Patch symptoms on sight.</td>
<td>10</td>
</tr>
<tr>
<td>6. Least-Risk Options are the only methods used for Necrotic Ring Spot/Summer Patch.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Necrotic Ring Spot/Summer Patch Mgt.** 60

**Total Points Earned for Necrotic Ring Spot/Summer Patch Management**

---

### Section 25. Powdery Mildew

[ ] NOT APPLICABLE *(Check here if Powdery Mildew is not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for Powdery Mildew are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When Powdery Mildew problems occur, contributing factors are identified and corrected (e.g., increase air circulation, plant resistant varieties or species in powdery mildew prone areas, reduce shading).</td>
<td>20</td>
</tr>
<tr>
<td>3. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for Powdery Mildew pest management.</td>
<td>5</td>
</tr>
<tr>
<td>4. Turf maintenance personnel are provided with training at least annually to recognize and report Powdery Mildew problems.</td>
<td>10</td>
</tr>
<tr>
<td>5. <strong>Bonus:</strong> Pest Manager can identify Powdery Mildew symptoms on sight.</td>
<td>10</td>
</tr>
<tr>
<td>6. Least-Risk Options are the only methods used for Powdery Mildew.</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Powdery Mildew Management** 60

**Total Points Earned for Powdery Mildew Management**

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(608) 232-1528, FAX (608) 232-1530, E-mail ipminstitute@ipminstitute.org, Web site: http://www.ipminstitute.org*
Section 26. Pythium

[ ] NOT APPLICABLE (Check here if Pythium is not a problem requiring action at your school and proceed to the next section.)

1. **Priority**: Action thresholds for Pythium are defined in the IPM Plan and effectively implemented. 20

2. When Pythium problems occur, contributing factors are identified and corrected (e.g., improve aeration and drainage, mow only when turf is dry, reduce irrigation). 20

3. **Priority**: Reduced-Risk or Least-Risk Options are the only methods used for Pythium pest management. 5

4. Turf maintenance personnel are provided with training at least annually to recognize and report Pythium problems. 10

5. **Bonus**: Pest Manager can identify Pythium symptoms on sight. 10

6. Least-Risk Options are the only methods used for Pythium. 5

**Total Points Available for Pythium Management** 60

**Total Points Earned for Pythium Management**

Section 27. Red Thread

[ ] NOT APPLICABLE (Check here if Red Thread is not a problem requiring action at your school and proceed to the next section.)

1. **Priority**: Action thresholds for Red Thread are defined in the IPM Plan and used to guide management decisions. 20

2. When Red Thread problems occur, contributing factors are identified and corrected (e.g., avoid overwatering especially during cool weather, correct nitrogen deficiencies with a quick release nitrogen fertilizer). 20

3. **Priority**: Reduced-Risk or Least-Risk Options are the only methods used for Red Thread management. 5

4. Turf maintenance personnel are provided with training at least annually to recognize and report Red Thread problems. 10

5. **Bonus**: Pest Manager can identify Red Thread symptoms on sight. 10

6. Least-Risk Options are the only methods used for Red Thread. 5

**Total Points Available for Red Thread Management** 60

**Total Points Earned for Red Thread Management**
### Section 28. Rhizoctonia Blight (Brown Patch)

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority</strong>: Action thresholds for Rhizoctonia Blight are defined in the IPM Plan. Actions are taken only when the disease has been correctly diagnosed and action thresholds are reached.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2. When Rhizoctonia Blight problems occur, contributing factors are identified and corrected (e.g., increase aeration, improve drainage, moderate nitrogen fertilizer rates, plant resistant varieties).</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>3. <strong>Priority</strong>: Reduced-Risk or Least-Risk Options are the only methods used for Rhizoctonia Blight management.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. Turf maintenance personnel are provided with training at least annually to recognize and report Rhizoctonia Blight problems.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5. <strong>Bonus</strong>: Pest Manager can identify Rhizoctonia Blight symptoms on sight.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6. Least-Risk Options are the only methods used for Rhizoctonia Blight.</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Total Points Available for Rhizoctonia Blight Management** 60

**Total Points Earned for Rhizoctonia Management**

---

### Section 29. Rusts

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority</strong>: Action thresholds for rusts are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2. When rust problems occur, contributing factors are identified and corrected (e.g., restore turf vigor, schedule irrigation so that grass blades dry quickly after irrigating).</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>3. <strong>Priority</strong>: Reduced-Risk or Least-Risk Options are the only methods used for rust management.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. Turf maintenance personnel are provided with training at least annually to recognize and report rust problems.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5. <strong>Bonus</strong>: Pest Manager can identify rust symptoms on sight.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6. Least-Risk Options are the only methods used for rust.</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Total Points Available for Rust Management** 60

**Total Points Earned for Rust Management**
### Section 30. Other Turf Diseases & Nematode Pests

[ ] NOT APPLICABLE  *(Check here if there are no other turf disease or nematode pests requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for these additional turf diseases or nematodes are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>2. When problems occur, the disease or nematode is identified correctly before taking action. Actions are appropriate for the problem.</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>3. Contributing factors are identified and corrected. <strong>List here:</strong></td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>4. Action thresholds for key turf diseases are adjusted according to the level of need, i.e. lawns can sustain higher pest levels than athletic fields during the playing season before action is justified.</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>5. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for turf disease and nematode pest management.</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6. <strong>Bonus:</strong> Pest Manager can identify on sight symptoms of these additional disease or nematode pests of turf common to the region. <strong>List here:</strong></td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>7. Least-Risk Options are the only methods used for turf disease and nematode pest management.</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Points Available for Other Turf Disease and Nematode Mgt.** 80

**Total Points Earned for Other Turf Disease and Nematode Mgt.**

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**Notes:**

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Resources for Turf Disease and Nematode Pest Management


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IPM for School Lawns

“Because the bodies of children and youths are often in direct contact with the grass, use of pesticides on lawns increasingly raises concerns among parents and health professionals. On the other hand, coaches and school administrators are under pressure to insure quality turf for use by students and by community athletic leagues. In addition, the competence of landscape maintenance staff is often judged by the aesthetic appearance of the lawns that surround most schools. These various viewpoints often come into conflict when pests threaten lawns.

The key to lawn IPM is the use of cultural practices that optimize growth of grasses and minimize conditions favorable to pest insects, weeds or pathogens.

An IPM approach to lawn management begins with a monitoring program. Monitoring enables Pest Managers to do the following:

- identify the pest(s)
- identify any natural enemies of the pest(s)
- apply preventive methods to reduce the occurrence of pest problems
- determine if any treatment is needed
- determine where, when and what kinds of treatments are needed
- evaluate and fine-tune treatments as the pest management program continues over the seasons”

- Excerpt from Daar et al. 1997

---

Turf Disease & Nematode Pests

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University of Minnesota. 2003. IPM of Midwest Landscapes. Cooperative project with the NCR-193 North Central Committee on Landscape IPM. Includes information on tree, shrub and turf pests. Many topics included in this publication are applicable beyond the Midwest region. For more information on this publication, please visit the website located at http://www.entomology.umn.edu/cues/. To order, download the order form on the web site. With questions, contact Susan Ratcliffe via email or by phone at (217) 333-9656 and sratclif@uiuc.edu.


Notes:
Turf Insect & Mite Pest Management

[ ] NOT APPLICABLE (Check here if turf insect and mite pests are not a problem requiring action at your school and proceed to Section 53. Vertebrate Pests)

Section 31. Billbugs

[ ] NOT APPLICABLE (Check here if billbugs are not a problem requiring action at your school and proceed to the next section.)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority: Action thresholds for billbugs are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. When billbug problems occur, contributing factors are identified and corrected (e.g., plant resistant varieties, reduce thatch buildup).</td>
<td>20</td>
</tr>
<tr>
<td>3. Billbug larvae are sampled by pulling turf and examining the crown areas for larvae and frass and/or adults are sampled using pitfall traps (i.e., place cups or cans in the ground so that the lip is at ground level.)</td>
<td>10</td>
</tr>
<tr>
<td>4. Insecticides are applied only when billbug adults are present and before substantial egg laying has occurred. If billbugs are managed effectively without insecticides, score as N/A.</td>
<td>10</td>
</tr>
<tr>
<td>5. Priority: Reduced-Risk or Least-Risk Options are the only methods used for billbug pest management.</td>
<td>5</td>
</tr>
<tr>
<td>6. Turf maintenance personnel are provided with training at least annually to recognize and report billbugs and damage.</td>
<td>10</td>
</tr>
<tr>
<td>7. Bonus: Pest Manager can identify billbugs common to the region on sight (e.g., Bluegrass, Denver, Hunting, Lesser, Phoenix Billbugs).</td>
<td>10</td>
</tr>
<tr>
<td>8. Least-Risk Options are the only methods used for billbug management.</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Points Available for Billbug Management 80

Total Points Not Applicable ______

Total Points Earned for Billbug Management ______
Section 32. Chinch Bugs

[ ] NOT APPLICABLE (Check here if chinch bugs are not a problem requiring action at your school and proceed to the next section.)

Common Key Pests on School Grounds

1. **Priority:** Action thresholds for chinch bugs are defined in the IPM Plan and effectively implemented.  
   Points Available: 20
   Points Earned: ________

2. When chinch bug problems occur, contributing factors are identified and corrected (e.g., correct compaction to improve water infiltration, increase irrigation during hot dry weather, moderate fertilizer rates and use slow release forms of nitrogen, plant resistant varieties, reduce thatch buildup).  
   Points Available: 20
   Points Earned: ________

3. Pest Manager can distinguish chinch bugs from beneficial big-eyed bugs.  
   Points Available: 10
   Points Earned: ________

4. Turf is monitored just before and during the hottest months of the season for chinch bugs (i.e., starting in April in Florida, late June in Wisconsin), and weekly at the start of the second generation, which is often the most damaging.  
   Points Available: 10
   Points Earned: ________

5. Chinch bug are sampled by the flotation method (i.e., using a board, gloves or other hand protection, press a coffee can with both ends cut out two to three inches into the soil, fill with water and count the chinch bugs that float to the surface within five to ten minutes).  
   Points Available: 10
   Points Earned: ________

6. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for chinch bug management.  
   Points Available: 5
   Points Earned: ________

7. Turf maintenance personnel are provided with training at least annually to recognize and report chinch bugs and damage.  
   Points Available: 10
   Points Earned: ________

8. **Bonus:** Pest Manager can identify chinch bugs common to the region on sight (e.g., Hairy, Southern Chinch Bugs).  
   Points Available: 10
   Points Earned: ________

9. Least-Risk Options are the only methods used for chinch bug management.  
   Points Available: 5
   Points Earned: ________

**Total Points Available for Chinch Bug Management**: 90

**Total Points Earned for Chinch Bug Management**: ________
### Section 33. Mole Crickets

[ ] NOT APPLICABLE (Check here if Mole Crickets are not a problem requiring action at your school and proceed to the next section.)

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

1. **Priority:** Action thresholds for mole crickets are defined in the IPM Plan and effectively implemented.

2. When mole cricket problems occur, contributing factors are identified and corrected (e.g., irrigate deeply and less frequently to encourage deep rooting, plant resistant varieties, raise mower height).

3. Mole crickets are sampled by a soapy water drench (i.e., drench a measured area of turf with soapy water poured from a sprinkling can, and count the number of mole crickets that emerge) and/or turf is monitored in early season for adults forming calling chambers.

4. When a pesticide is necessary, a spot application is limited to infested areas instead of treating an entire lawn or field. Treated areas are re-sampled to evaluate results and retreated if needed. *If mole crickets are managed effectively without insecticides, score as N/A.*

5. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for mole cricket pest management.

6. Turf maintenance personnel are provided with training at least annually to recognize and report mole crickets and damage.

7. **Bonus:** Pest Manager can identify mole crickets common to the region on sight (e.g., Northern, Short-Winged, Southern, Tawny Mole Crickets).

8. Least-Risk Options are the only methods used for mole cricket management.

**Total Points Available for Mole Cricket Management** 80

**Total Points Not Applicable**

**Total Points Earned for Mole Cricket Management**

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**Notes:**

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**Pests**

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Section 34. Turf-Feeding Caterpillars: Armyworms, Cutworms, Sod Webworms

[ ] NOT APPLICABLE (Check here if turf-feeding caterpillars are not a problem requiring action at your school and proceed to the next section.)

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Priority: Action thresholds for problem turf-feeding caterpillars are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2.</td>
<td>When problems occur, the caterpillar is identified correctly before taking action. Actions are appropriate for the problem caterpillar.</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>When turf-feeding caterpillar problems occur, contributing factors are identified and corrected (e.g., correct problem drainage areas, moderate fertilizer rates and use slow release forms of nitrogen, reduce thatch buildup).</td>
<td>20</td>
</tr>
<tr>
<td>4.</td>
<td>Action thresholds are based on numbers of feeding caterpillars.</td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>Pesticides, if used, are applied only when feeding caterpillars are present. If caterpillars are effectively managed without pesticides, score as N/A.</td>
<td>10</td>
</tr>
<tr>
<td>6.</td>
<td>Turf-feeding caterpillars are sampled by a soapy water drench (i.e., drenching a measured area of turf with soapy water poured from a sprinkling can, and counting the number of turf-feeding caterpillars that emerge) and/or pheromone or blacklight traps for adults.</td>
<td>10</td>
</tr>
<tr>
<td>7.</td>
<td>When a pesticide is necessary, a spot application is limited to infested areas instead of treating an entire lawn or field. If caterpillars are effectively managed without pesticides, score as N/A.</td>
<td>10</td>
</tr>
<tr>
<td>8.</td>
<td>Priority: Reduced-Risk or Least-Risk Options are the only methods used for turf-feeding caterpillar pest management.</td>
<td>5</td>
</tr>
<tr>
<td>9.</td>
<td>Turf maintenance personnel are provided with training at least annually to recognize and report turf-feeding caterpillars and damage.</td>
<td>10</td>
</tr>
<tr>
<td>10.</td>
<td>Bonus: Pest Manager can identify turf-feeding caterpillars common to the region on sight (e.g., armyworms, cutworms, Sod Webworms).</td>
<td>10</td>
</tr>
<tr>
<td>11.</td>
<td>Least-Risk Options are the only methods used for turf-feeding caterpillar management.</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Points Available for Turf-Feeding Caterpillar Management | 120 |
Total Points Not Applicable |  |
Total Points Earned for Turf-Feeding Caterpillar Management |  |
### Section 35. White Grubs

[ ] **NOT APPLICABLE** *(Check here if white grubs are not a problem requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th>Common Key Pests on School Grounds</th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for problem white grubs are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>2. When problems occur, the white grub is identified correctly before taking action. Actions are appropriate for the problem grub.</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>3. When white grub problems occur, factors contributing to the problem are identified and corrected (e.g., correct compaction to improve water infiltration, correct problem drainage areas).</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>4. White grubs are sampled by extracting a turf core with a bulb planter or golf course cup cutter, by cutting and peeling back a square of turf and counting the number of white grubs present, and/or by pheromone or blacklight trapping of adult beetles.</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>5. Action thresholds for grubs are appropriate to the problem species (i.e., turf can withstand much higher number of Black Turfgrass Ataenius beetles (30 to 50 per sq. ft.) than European Chafers (0.5 to 7 per sq. ft.) before action is required).</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>6. Insecticides, if used for grubs, are applied when grubs are small (e.g., fall for Japanese Beetle, Green June Bug). Insecticide treatments are not made after grubs have stopped feeding. <em>If grubs are managed effectively without insecticides, score as N/A.</em></td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>7. Action thresholds for grubs are appropriate to the pest management unit (i.e. actions are taken on high-profile lawns at a lower threshold than less visible or infrequently used lawn areas).</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>8. When a pesticide is necessary, a spot application is limited to infested areas instead of treating an entire lawn or field. <em>If grubs are managed effectively without insecticides, score as N/A.</em></td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>9. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for white grub management.</td>
<td>5</td>
<td>______</td>
</tr>
<tr>
<td>10. Turf maintenance personnel are provided with training at least annually to recognize and report white grubs and white grub damage.</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>11. <strong>Bonus:</strong> Pest Manager can identify white grubs common to the region on sight (e.g., Asiatic Garden Beetle, Black Turfgrass Ataenius, Green June Beetle, Japanese Beetle, Masked Chafer, May/June beetles, Oriental Beetle).</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>12. Least-Risk Options are the only methods used for white grubs.</td>
<td>5</td>
<td>______</td>
</tr>
</tbody>
</table>

**Total Points Available for White Grub Management** 130

**Total Points Not Applicable** ______

**Total Points Earned for White Grub Management** ______
### Section 36. Other Turf Insect & Mite Pests

[ ] NOT APPLICABLE  
*(Check here if there are no other turf insect or mite pest problems requiring action at your school and proceed to the next section.)*

<table>
<thead>
<tr>
<th></th>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Priority: Action thresholds for these additional turf insect or mite pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>2. When problems occur, the pest is identified correctly before taking action. Actions are appropriate for the problem pest.</td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>3. Contributing factors are identified and corrected. <strong>List here:</strong></td>
<td>20</td>
<td>______</td>
</tr>
<tr>
<td>4. Action thresholds for key turf insect and mite pests are adjusted according to the level of need (i.e. lawns can sustain higher pest levels than athletic fields during the playing season).</td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>5. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for turf insect and mite management.</td>
<td>5</td>
<td>______</td>
</tr>
<tr>
<td>6. <strong>Bonus:</strong> Pest Manager can identify these additional turf insect and mite pests on sight. <strong>List here:</strong></td>
<td>10</td>
<td>______</td>
</tr>
<tr>
<td>7. Least-Risk Options are the only methods used for turf insect and mite management.</td>
<td>5</td>
<td>______</td>
</tr>
</tbody>
</table>

**Total Points Available for Other Turf Insect or Mite Pest Management** 80

**Total Points Earned for Other Turf Insect or Mite Pest Management** 80

---

**Resources for Turf Insect and Mite Pest Management:**


Part II. IPM Standards for School Grounds


University of Minnesota. 2003. IPM of Midwest Landscapes. Cooperative project with the NCR-193 North Central Committee on Landscape IPM. Includes information on tree, shrub and turf pests. Many topics included in this publication are applicable beyond the Midwest region. For more information on this publication, please visit the website located at http://www.entomology.umn.edu/cues/. To order, download the order form on the web site. With questions, contact Susan Ratcliffe via email or by phone at (217) 333-9656 and sratclif@uiuc.edu.


Vittum, P. 2002. White Grub Management Update. Dr. Pat Vittum, Turf Entomologist with the UMass Extension Turf Program, has written a detailed management update about white grub management for the fall of 2002.


Notes:

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Pests

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Vertebrate Pests

Section 37. Vertebrate Pests: Coyotes, Deer, Feral Cats and Dogs, Gophers, Moles, Rabbits, Raccoons, Rodents, Skunks, Snakes, Woodchucks, etc.

[ ] NOT APPLICABLE (Check here if vertebrates are not a problem requiring action at your school and proceed to the next section.)

Common Key Pests on School Grounds

1. **Priority:** Persons handling vertebrate traps or bait stations or inspecting suspected harborage (e.g., crawl spaces, attics) are trained in public health risks and proper hygiene and wear appropriate protective gear. Traps, bait stations or other surfaces contaminated with urine or feces are properly disposed of or disinfected.

   Points Available: 20  
   Points Earned: ________

2. **Priority:** Pest Manager is aware of and understands Federal, state and local laws pertaining to vertebrate pest management and protected/endangered vertebrate species.

   Points Available: 20  
   Points Earned: ________

3. **Priority:** Action thresholds for key vertebrate pests are defined in the IPM Plan and effectively implemented.

   Points Available: 20  
   Points Earned: ________

4. When problems occur with vertebrate pests, contributing factors are identified and corrected (e.g., denying access to food, water or shelter by exclusion, sanitation, replacing vertebrate pest-prone plants, etc.).

   Points Available: 20  
   Points Earned: ________

5. Legible records are maintained indicating when key vertebrate pests appear, relative abundance and impacts from one year to the next. This information is used to evaluate and adjust pest management strategies.

   Points Available: 10  
   Points Earned: ________

6. Pesticides (e.g., toxic baits) are used only when action thresholds are exceeded and only by personnel fully trained in bait selection (coagulant vs. anticoagulants, blocks vs. pellets vs. grain-based, tracking powders, etc.). *If vertebrate pests are managed effectively without pesticides, score as N/A.*

   Points Available: 10  
   Points Earned: ________

7. A communications program is in place to school staff and students about their role in preventing and reporting vertebrate pest problems.

   Points Available: 10  
   Points Earned: ________

8. **Priority:** Snap traps, if used for vertebrate pests, are placed only in areas not accessible to children (e.g., in locked outbuildings, inaccessible animal dens or tamper-proof containers securely attached to the ground so that the container cannot be picked up or moved). *If vertebrate pests are managed effectively without snap traps, score as N/A.*

   Points Available: 20  
   Points Earned: ________

9. Inspections for vertebrate pests include examining school grounds for food sources (e.g., edible plants, fallen fruit and nuts), animal feces, nests, etc. If signs of vertebrate feeding or activity are found, conditions favoring pests are corrected (e.g., modify stretches of dense vegetation or tall ground cover that allow vertebrate pests to travel long distance under cover).

   Points Available: 10  
   Points Earned: ________

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10. **Priority:** Reduced-Risk or Least-Risk Options are the only methods used for vertebrate pest management.  

11. **Bonus:** Teachers incorporate IPM for vertebrate pests into curricula and/or class projects.  

12. **Bonus:** Pest Manager can identify vertebrate pests common to the region on sight.  

13. Least-Risk Options are the only methods used for vertebrate pest management.  

**Total Points Available for Vertebrate Pest Management** 150  
**Total Points Not Applicable**  
**Total Points Earned for Vertebrate Pest Management**  

---  

**Resources for Vertebrate Pest Management:**  


**Notes:**
### Weeds

**Section 38. Weeds**

<table>
<thead>
<tr>
<th>Points Available</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Key Pests on School Grounds</strong></td>
<td></td>
</tr>
<tr>
<td>1. <strong>Priority:</strong> Action thresholds for key weed pests are defined in the IPM Plan and effectively implemented.</td>
<td>20</td>
</tr>
<tr>
<td>2. Rough weed maps or diaries are prepared at least annually for areas where weeds are growing, noting which weeds are present and where.*</td>
<td>20</td>
</tr>
<tr>
<td>3. When weed problems occur, contributing factors are identified and corrected (e.g., compaction, low nutrient levels, improper plant placement).</td>
<td>20</td>
</tr>
<tr>
<td>4. Legible records are maintained indicating when key weed pests appear, relative abundance and impacts (e.g., control costs, complaints, etc.) from one year to the next. This information is used to evaluate and adjust weed management strategies.</td>
<td>10</td>
</tr>
<tr>
<td>5. Where appropriate, spot treatments are made rather than area-wide treatments (e.g., a wick-type herbicide applicator is used to apply a small amount of herbicide on individual weeds or patches of weeds). <em>If weeds are managed without herbicides, score as N/A.</em></td>
<td>10</td>
</tr>
<tr>
<td>6. Herbicides are applied when students are not present (e.g., after the school day, weekends, school breaks). <em>If weeds are managed without herbicides, score as N/A.</em></td>
<td>10</td>
</tr>
<tr>
<td>7. <strong>Priority:</strong> Reduced-Risk or Least-Risk Options are the only methods used for weed management.</td>
<td>5</td>
</tr>
<tr>
<td>8. <strong>Bonus:</strong> Herbicides are not applied for weeds that are aesthetic problems only.</td>
<td>10</td>
</tr>
<tr>
<td>9. <strong>Bonus:</strong> Pest Manager can identify problem weeds common to the region on sight, including those designated as noxious weeds or protected plants by federal, state or local laws.</td>
<td>10</td>
</tr>
<tr>
<td>10. <strong>Bonus:</strong> Pest Manager knows the requirements for growth and methods of reproduction for key weed pests.</td>
<td>5</td>
</tr>
<tr>
<td>11. Least-Risk Options are the only methods used for weed management.</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note: *If weeds are managed without herbicides, score as N/A.
Total Points Available for Weed Management 100
Total Points Not Applicable ___
Total Points Earned for Weed Management ___

*Indicates great class project idea!

Resources for Weed Management:

Cornell University. A good web site for poisonous plants which includes clear photographs and “Ask the Expert” questions and answers that can be integrated into K-12 curriculum offerings. Includes a poisonous plant database, alphabetical listings for both common and botanical names, a list of toxic agents in plants and a list of species commonly affected. Available at http://www.ansci.cornell.edu/plants/index.html.


New Jersey Weed Gallery. Rutgers University. Color weed photos of more than 100 weed species, indexed by common and Latin names, plus thumbnail photo index. Available at http://www.rce.rutgers.edu/weeds/.


“School landscape maintenance budgets rarely stretch far enough to suppress all weeds, even if that were desirable. Identify areas where weeds pose potential health or safety hazards or threaten damage to facilities, and distinguish these locations from those where weeds are considered aesthetic problems alone.”

- Excerpt from Daar et al. 1997
Center for Aquatic and Invasive Plants. University of Florida. *With the popularity of butterfly gardens and botanical gardens in schoolyards, some schools are risking children with poisonous plants and themselves with invasive and non-native species.* The University of Florida's Center for Aquatic and Invasive Plants' web site lists many of these plants along with their photographs. Available at [http://plants.ifas.ufl.edu](http://plants.ifas.ufl.edu) K-12 teachers can also order free murals on native and invasive plants from the Center. Posters, card sets, coloring books and other teaching tools are also available for purchase. The site isn't just for Florida but contains links to listings of Non-Native Invasive Aquatic and Wetland Plants in the United States at [http://plants.ifas.ufl.edu/seagrant/invlists.html](http://plants.ifas.ufl.edu/seagrant/invlists.html). A book on Identification and Biology of Non-native Plants in Florida's Natural Areas at [http://ifasbooks.ufl.edu/merchant2/merchant.mvc?Screen=PROD&Store_Code=IFASBOOKS&Product_Code=SP+257](http://ifasbooks.ufl.edu/merchant2/merchant.mvc?Screen=PROD&Store_Code=IFASBOOKS&Product_Code=SP+257).

**Notes:**
Appendix A. Reduced-Risk and Least-Risk Pest Control Option Definitions

Introduction

How do you decide which is the best legally permitted option to use when pests exceed acceptable levels? Safety (degree of risk) should be primary considerations, along with effectiveness, convenience and cost.

Risk depends upon **hazard** (toxicity) and **exposure**. A measure of hazard to humans and other mammals is provided by signal words on pesticide labels. The most toxic are labeled DANGER, followed by WARNING. The least toxic are labeled CAUTION. Other potential hazards include possible carcinogens (cancer-causing substance) or endocrine-disrupting ingredients (substances that may adversely affect the action of hormones in wildlife and humans). These criteria are not identified on the pesticide labels. Risk occurs where humans, wildlife or other non-target organisms are exposed, or come into contact with, hazardous substances.

We have devised the following system to identify and direct those working in schools and other sensitive environments towards pest control options with lesser risks. A Pest Control Options Review Committee, appointed by the IPM Institute and made up of professionals from Universities, Extension, government agencies, industry and public and environmental organizations, maintains these definitions and may rule on exceptions.

Certified schools may not use pesticides labeled WARNING or DANGER. Certified schools may use some pesticides labeled CAUTION, if they meet the criteria defined on the following page, which consider primarily toxicity to mammals, birds, fish and beneficial organisms and low potential for groundwater contamination. All pesticides are to be used only when needed according to monitoring, inspection and predetermined action thresholds, and based on proper pest identification and diagnosis.

The Pest Control Option Review Committee may choose to exempt specific materials from these restrictions where the formulation or use greatly reduces potential for exposure or where lesser risk options are not available to address significant pest threats. These exempted materials will be added to the Pest Control Options List with an explanation of why the exemption was enacted.

Any system to rank risks and direct use towards lesser risk alternatives will be less than perfect. Using the system presented here leaves important concerns unanswered. For example, is using a large quantity of a material defined as “least-risk” better than using a smaller amount of a “reduced-risk” material? This system does not fully evaluate the inert ingredients in pesticides, due to the difficulty in obtaining that information. Finally, reducing risk is ultimately the responsibility of everyone involved in the selection, purchase, transportation, storage and use all pest control options in a legal and responsible manner, following all label directions.
Definitions
For a list of options meeting the Reduced or Least-Risk definitions, contact the IPM Institute or visit the Website at [http://www.ipminstitute.org](http://www.ipminstitute.org). NOTE: Not all materials meeting these definitions may be permitted in your state or region. The user bears all responsibility for conforming to Federal, state and local regulations for use of all pesticides.

<table>
<thead>
<tr>
<th>Least-Risk Options:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pesticides with very low mammalian toxicity via oral, inhalation or dermal routes, no eye effects, mild or slight skin effects (= EPA Toxicity Category IV); or</td>
</tr>
<tr>
<td>2. EPA Toxicity Category III insecticidal baits in ready-to-use, non-volatile formulations and placed in areas inaccessible to children and the general public; or</td>
</tr>
<tr>
<td>3. EPA Toxicity Category III rodenticides in bait-block, non-volatile formulations placed in tamper-proof bait stations in areas inaccessible to children and the general public; or</td>
</tr>
<tr>
<td>4. Non-chemical pest control options (cultural, mechanical, physical controls) with no potential physical hazards; or</td>
</tr>
<tr>
<td>5. Pesticides classified by the US EPA as exempt materials under 40 CFR 152.25.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reduced-Risk Options:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pesticides with low mammalian toxicity via oral, inhalation and dermal routes, moderate eye and skin effects (= EPA Toxicity Category III) and not meeting criteria for Least-Risk.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prohibited Pest Control Options:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prohibited for indoor or outdoor use:</td>
</tr>
<tr>
<td>1. Any pesticides containing active ingredients classified as known, likely or probable carcinogens or reproductive toxins according to any of the following lists: State of California EPA List of Chemicals Known to Cause Cancer or Reproductive Toxicity, State of Illinois EPA List of Known Endocrine Disrupters, US EPA List of Chemicals Evaluated for Carcinogenic Potential.</td>
</tr>
<tr>
<td>2. Any pesticides containing inert ingredients included on US EPA’s List 1: Inerts of Toxicological Concern.</td>
</tr>
<tr>
<td>3. Any formulations and uses presenting a potential physical hazard or dust/powder inhalation hazard to building occupants.</td>
</tr>
</tbody>
</table>

In addition, any pesticides meeting the following criteria are prohibited for use outdoors:

| 4. Any pesticides with label precautionary statements including “toxic” or “extremely toxic” to bees, birds, fish or wildlife.** |
| 5. Any pesticides with label precautionary statements including specific warnings regarding ground or surface water contamination. |
| 6. Any pesticide implicated as harmful to natural enemies of pests in school environments. |

**“Does not apply to pesticides used as per label directions to control bird, fish, wildlife or stinging insect pests.”
Appendix B. Glossary

Synonyms are listed in parentheses:

**Action Thresholds** (Action Level) – The number of pests or level of pest damage requiring action to prevent damage from exceeding tolerable levels. For some pests, the action threshold will be one, for example a single yellowjacket in a classroom.

For other pests, action may be needed before pests or pest damage appears. In those cases, an action threshold may be defined as a set of conditions, e.g., plant is at a susceptible stage and all or nearly all environmental conditions are in place for a pest problem to occur. For example, fire blight disease of Rosaceous landscape plants requires (1) warm temperatures (above an average temperature of 60 F for three consecutive days); (2) a route of entry through the plants' defenses (open blossoms, hail damage or other wounds); (3) free water (heavy dew, rainfall); plus (4) availability of bacterial spores. An action level for fire-blight-susceptible plants can be defined based on the first three requirements, especially if the site or adjacent sites have a history of fire blight infected plants.

Including written action thresholds in the IPM Plan presents a clear statement of intentions before a pest event occurs. This guidance can be invaluable to those called to respond to a pest situation and can prevent under or over-reactions to pest problems.

For a great explanation of action thresholds, see Maryland Department of Agriculture, “Action Thresholds in School IPM Programs.” Pesticide Regulation Section, Annapolis, MD. 10 pp. Available at [http://schoolipm.ifas.ufl.edu/tp.htm](http://schoolipm.ifas.ufl.edu/tp.htm)

**Anti-Microbial Pesticide** – A pesticide used for control of microbial pests including viruses, bacteria, algae and protozoa or the purpose of disinfecting or sanitizing. Anti-microbials do not include fungicides used on plants.

**Integrated Pest Management (IPM)** – An approach to maintaining insect, mite, disease, nematode, weed, or vertebrate pests at tolerable levels by using biological knowledge of pests and pest behavior to implement long-term, least-risk solutions. Pests and pest damage are monitored and action is taken only when necessary to prevent damage from exceeding tolerable levels. Actions are selected with the least risk to humans, other non-pest organisms and the environment and are carefully timed for maximum effectiveness. Strategies are implemented to resolve factors that contribute to pest problems, avoiding the need to take action in the future.

**IPM Committee** – This group addresses pest management issues on an ongoing basis. The committee should include representation from all segments of the school community, including administration, staff and parents. The role of the committee is to formulate IPM policy and plans and provide oversight and ongoing decision-making, incorporating input from all interested parties.

**IPM Continuum** – The progression of pest management strategies towards least-risk, long-term prevention and avoidance of pest problems. The Continuum begins with a focus on monitoring and chemical suppression when pests approach unacceptable levels, and ends with balanced systems where pests remain at tolerable levels with minimal cultural and biological interventions. (For more information, see back cover.)

**IPM Coordinator** – The school employee responsible for day-to-day interpretation of the IPM policy for a school or school system. The IPM Coordinator may or may not be a pest management professional, but is the decision-maker who receives specialized training in IPM, accesses the advice of professionals and chooses a course of action. For example, the IPM Coordinator may be the facilities manager or environmental manager. For schools with an in-house professional pest management program, the IPM Coordinator may also be the Pest Manager.

**IPM Plan** – A written document including specific information regarding the operation of the school’s IPM program, such as IPM roles for all school staff, parents, students and other community members; pesticide application notification policies; list of key pests; action thresholds, a risk-based hierarchy of
control options and prevention/avoidance strategies to be used for key pests; inspection schedules for school facilities; policies for working with outside contractors; lists of resources for resolving technical questions; and other pertinent information. The IPM Plan provides an excellent tool for training new personnel including during management transitions. The Plan is a “living document” updated frequently with new information as it becomes available. IPM Plans are often developed in binder format so that information can be easily added and updated.

**IPM Policy** – A written document stating a school’s commitment to IPM and defining overall IPM goals. This document is updated periodically and used to guide decision-making as the IPM program is implemented.

**Key Pest** – An insect, mite, disease, nematode or weed that frequently results in unacceptable damage and thus typically requires a control action. Key pests vary from one region to the next. Key pest status is dependent on action thresholds set for the pest. For example, cutworms may be a key pest on high-visibility athletic fields, but not on adjacent lawn areas where the typical level of cutworm damage is very tolerable. Routine or regularly scheduled pesticide applications can mask key pests, which may not become apparent for some time after routine pesticide applications have been stopped.

**Key Plant** – A plant that frequently experiences unacceptable pest damage and thus typically requires treatment. Key plants vary from one region to the next. Poor care or improper placement within the landscape can result in a plant becoming a key plant by increasing its susceptibility to pest problems.

**Least-Risk Pest Control Options** – Pest controls meeting specific criteria listed in Appendix A.

**Management Unit** – A subdivision that is typically treated the same. Dividing landscapes into management units permits more accurate response to site-specific conditions. For example, it is often a good idea to divide school lawns into front and back lawn management units. Front lawn and back lawns may have different soil types, shading, slopes, etc. By sampling and testing soil from those areas separately, test results and fertilization will be more precise and give better results. Pest monitoring can also be conducted separately and action thresholds set higher for front lawns, because appearance is more critical than for less visible back lawns. In school buildings, pool and locker room areas, food preparation and service areas, and boiler rooms are examples of specific management units.

**Pathogen** – A living microorganism, usually a bacterium, fungus, mycoplasm or virus that can cause disease when a host is present under the right environmental conditions.

**Pest** – A term applied to an organism (e.g., insect, mite, disease, nematode, weed, vertebrate, microbe, etc.) when it causes a problem to humans. A pest in one environment can be very beneficial in another (e.g., many plants considered weeds when found in lawns can be essential to the restoration of wild landscapes after a disturbance such as flood or fire).

**Pest Management Roles** – The responsibilities assumed by individuals in the school system to maintain an environment free of interference from pest and pesticide risks.

**Pest Manager** – The individual who conducts actions and/or directs others to maintain effective pest management at a site. The Pest Manager receives specialized pest management and IPM training and is licensed and certified to apply pesticides in schools. The Pest Manager may be a school employee or a professional Pest Manager contracting with the school. For schools with an in-house professional pest management program, the IPM Coordinator may also be the Pest Manager.

**Priority Practices** – Practices in the Standards labeled “Priority” must be implemented for certification. You must earn at least 80% of the points for each Priority Practice to become IPM Certified.

**Reduced-Risk Pest Control Options** - Pest controls meeting specific criteria listed in Appendix A.

**Scouting** (Monitoring, Inspection) – Planned, regular monitoring or a crop, ornamental planting, landscape or structure for the purpose of detecting pests, pest damage or conditions conducive to pests or pest damage.
Appendix C. Additional Resources for Implementing IPM in Schools

General Resources

Arguello, M., Campbell, K., Kegley, S., Ille, T., Porter, C., Undem, M. 2001. Healthy Schools Campaign Pesticide Action Kit. This English/Spanish informational kit contains resource materials that school administrators and parents can use to help them eliminate hazardous pesticide use around their schools. The kit looks at how to organize community interest in least-toxic Integrated Pest Management policy, and it presents resources on the toxicity and health impacts of pesticides applied in schools. The kit's informational sheets are entitled as follows: "What is the Healthy Schools Act?;” "Ten Steps to a Healthy School;” "Notification: Your Right to Know;” "Kids at Risk: Pesticides & Children's Health;" "What Are the Alternatives;” "Hazards of Common Pesticides;" and "Pesticide Information Online." A sample school policy and a resource list are included. 20p. To order, write Californians for Pesticide Reform, 49 Powell Street, Suite 530, San Francisco, CA 94102. Tel: 1-415-981-3939.


Childproofing our Communities Campaign. 2001. Poisoned Schools: Invisible Threats, Visible Actions. 79 pp. Details risk of toxic contamination of school sites and of improper pesticide use in schools; presents specific recommendations for locating schools to avoid contaminated sites and for implementing IPM in schools. Includes a comprehensive "Gold Standard" for IPM in schools. Available in part at http://www.childproofing.org/poisonedschoolsmain.html, and in print from Center for Health, Environment and Justice, P.O. Box 6806, Falls Church VA 22040, (703) 237-2249, childproofing@chej.org.


Environmental Protection Agency. 2002. Healthy School Environments Web Portal. The Healthy School Environments web page is intended to serve as a portal to on-line resources to help facility managers, school administrators, architects, design engineers, school nurses, parents, teachers and staff address environmental health issues in schools. While the information is primarily intended to help improve the environment of school facilities, educational resources for students and teachers can also be found through the Healthy School Environments portal. Visitors can browse resources by geographic area, or search all resources by entering specific keywords into the search box at the top of each page. Available at http://epa.gov/schools.


Environmental Protection Agency. 2002. "Protecting Children in Schools from Pests and Pesticides." A new brochure on school IPM. Copies of the brochure may be obtained by calling 1-800-490-9198 (EPA's National Service Center for Environmental Publications) and requesting document number EPA-735-F-02-014.


Hawkins, B. L. 2001. Facilities Design & Management. "The Minds Behind the Schools." Highlights three individuals whose ideas have contributed to some groundbreaking educational facilities. Two individuals have developed schools that are centers of their communities while the third is expert at designing integrated pest management systems.


Hollingsworth, C.S. (Ed.). 2000. Integrated Pest Management Guidelines for Structural Pests: Model Guidelines for Training and Implementation. 58 pp. Describes practices that should be used by professional pest control practitioners who wish to be identified as IPM practitioners, but can also be used by homeowners for implementing their own IPM program to control pests such as ants, cockroaches, fleas, flies, rodents and subterranean termites. Available from Extension Bookstore, Draper Hall, University of Massachusetts Amherst, Massachusetts, 01003. Phone 413-545-0111, E-mail books@umext.umass.edu, Web site http://www.umass.edu/umext/bookstore/index.html.


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Mage, D., Gondy, G., & Yimesghen, G., 2002. Pesticides in Schools: Planning for a Feasibility Study to Determine the Need for A Full-Scale National Study. Temple University Institute for Survey Research. A contracted report regarding the need for a full-scale pesticides in schools study by the US EPA. 36-page report includes Introduction & Background, Elements, Definitions, Summary, Response Rates, the Pre-Pilot Study, Design Effect, Need for a Pilot Study, Conceptualization of the National Study, Statistical Analyses, Budgetary Analysis, Summary & Conclusion, References as well as appendices. To request, contact US EPA or Institute for Survey Research, 1601 North Broad Street, Philadelphia, PA 19122-6099.


Maine School IPM Program. PowerPoint presentations for school IPM. Maine School IPM Program provides two valuable PowerPoint presentations for school IPM entitled "Maine School IPM" and "Pesticide Application Rules for Schools in Maine." Available at http://www.state.me.us/agriculture/pesticides/schoolipm.


Merchant, H. F., and M. E. Merchant, 1997. The ABC's of IPM Video Series: Module 1, An Introduction; Module 2, Structural Pest Control; Module 3, Food Handling Areas; Module 4, Bids and Contracts; Module 5, The Administrative Challenge. Available from Distribution and Supply Office, Texas Agricultural Extension Service, P.O. Box 1209, Bryan TX 77806-1209. (979) 845-6571, FAX (979) 862-1566.


Miller, N. L. 1995. The Healthy School Handbook. Conquering the Sick Building Syndrome and Other Environmental Hazards In and Around Your School. This book compiles 22 articles concerning sick building syndrome in educational facilities in the following three areas: determining whether a school is sick; assessing causes and initiating treatment; and developing interventions. Articles address such topics as managing the psycho-social aspects of sick building syndrome; how indoor air quality affects pre-existing health problems; adverse effects of artificial lighting on learning and behavior in children; the least toxic approaches to managing pests in schools; the multi-disciplinary approach to treating environmentally triggered illnesses in school-age children; the practical and cost-effective approaches to building, remodeling, and maintaining schools; and the legal aspects of pollution in schools. 446p. To order, contact the National Education Association with ERIC NO: ED426579; ISBN-0-8106-1863-X.


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US EPA. 2002. EPA Guide to Protecting Children's Health in Schools. The US EPA has created an online or downloadable guide to identifying potential hazards in schools. The guide includes planning tools, a virtual tour of a school to help identify hazards, a section on case studies as well as a list of resources and contacts. Available at http://www.epa.gov/seahome/child.html.


University of Florida. 2001. School IPM Model Contract. Extensive outline designed to be used by officials working in schools, such as purchasing agents, who are responsible for procuring pest management services. Available at http://schoolipm.ifas.ufl.edu/doc/model_contract.htm.


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**Model Legislation**


California. Pesticide & Toxic Chemical News, Vol. 30, No.14. The California Department of Pesticide Regulation has launched a new version of its School Integrated Pest Management Website, which includes a step-by-step checklist to help school officials determine when pesticide use must be reported and indicated by posted signs. It also contains links to databases and IPM resources. The address is http://www.cdpr.ca.gov/cfdocs/apps/schoolipm/main.cfm.

CA Drift Around Schools Legislation -AB 947. 2002. Assembly Bill 947 awaits Gov. Davis' signature. If signed into law, AB 947 would allow local agricultural authorities the ability to regulate ANY pesticides within 1/4 mile of schools. This means that increased regulations and conditions could be put into place in order to prevent pesticide drift, or other pesticide-related accidents, around schools if local officials deem it necessary. It would also increase the maximum fine for a serious violation from the current $1,000 to $5,000 and encourage schools to adopt pesticide emergency response plans. This drafting of this bill was a result of a pesticide drift incident in Ventura County in 2000 that caused students and staff to become ill after being exposed to Lorsban, a "non-restricted" pesticide. The chemical drifted from an adjacent orchard and resulted in exposure to teachers and children alike. Cuyama Elementary School in Santa Barbara County experienced a similar drift incident in 1999 that also resulted in the school being closed down after students and staff were exposed to metam sodium, a highly toxic, "restricted-use" material.

California, State of. 2000. Assembly Bill 947. Proposed bill would require every school located within one quarter mile of agricultural land under production to create and maintain a safety plan that specifically addresses pesticide drift and accidental exposure to pesticides. County commissioners would be empowered to regulate use of pesticides near sensitive sites, including schools, and to levy penalties of up to $5000 for violations.

California, State of. 2000. An act to add Chapter 11 (commencing with Section 12420) to Division 6 of the Food and Agricultural Code, relating to pesticide regulation. Bill requires persons applying pesticides in schools to have annual training in pesticide safety and handling. Department of Pesticide Regulation is to prepare and distribute training materials to all school districts. http://www.assembly.ca.gov/acs/acsframeset2text.htm

California, State of. 2000. An act to add Section 48980.3 to, and to add Article 4 (commencing with Section 17608) to Chapter 5 of Part 10.5 of, the Education Code, and to add Article 17 (commencing with Section 13180) to Chapter 2 of Division 7 of the Food and Agricultural Code, relating to school safety. The "Healthy Schools Act of 2000" would require schools to employ "effective least toxic pest management practices;" maintain records of all pesticide use for 4 years and make the records available to the public upon request; create a registry of those wishing to be notified of pesticide applications; provide written notification and posted warning signs of expected pesticide use. The bill

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would also require that pest control operators include information on any school pesticide application that they perform as part of their pesticide use reporting requirements. http://www.leginfo.ca.gov/pub/bill/asm/ab_2251-2300/ab2260_bill_20000831_enrolled.html

Connecticut, State Legislature. House Bill 99-165, An Act Concerning Notice of Pesticide Applications at Schools and Day Care Centers. Ensures certification for pesticide applicators, written statement of the board’s policy on pesticide application on school property and a description of any pesticide applications made at the school during the previous school year, written guidelines on how the integrated pest management plan is to be implemented, and restrictions on when spraying can be done. Available at http://www.cga.state.ct.us/ps99/act/ pa/pa165.htm.

Delahaut, Karen. 2001. "Wisconsin's program for school pest management protects children." Over 67 percent of Wisconsin's schools have participated in Integrated Pest Management, or IPM programming in an effort to reduce health risks to children. A total of 1,395 schools had voluntarily participated in the program by August and new state legislation on pesticide use in schools was enacted in September. Available at http://www1.uwex.edu/news/story.cfm/433.


Illinois, State of. 2003. Senate Bill 1079. SB1079 passed both the Illinois House and Senate unanimously. The bill now goes to the Governor for his signature. With this legislation in place, daycare centers in Illinois will be required to practice Integrated Pest Management and to notify parents 2 days prior to and not more than 30 days in advance of pesticide applications.


Illinois, State of. 2000. An act to amend the Structural Pest Control Act. Includes notification provisions for pesticide applications in school buildings. Schools are required adopt an integrated pest management plan unless the school can demonstrate that IPM will be more expensive than current costs for pest control. Available at http://www.legis.state.il.us/legislation/publicacts/pubact91/acts/91-0525.html.


Illinois General Assembly. 2003. Public Act 093-0381. An act concerning child care facilities. Act regards pesticide application at daycares and requires licensed day cares to give notification of spraying no more than 30 days before the application. Act also ensures that children must be gone and return no sooner than two hours after pesticide application. Available at http://www legis.state.il.us/legislation/publicacts/fulltext.asp?Name=093-0381.

Indiana, General Assembly of. 2001. House Bill 1250. Proposed bill would require the governing body of a public school or nonpublic school to adopt and implement policies and procedures designed to effectively control pests and minimize potential exposure of children to pesticides in school buildings; authorizes the state chemist to adopt rules for public and private schools and licensed day care centers concerning the use of pesticides. Available in PDF format, http://www.state.in.us/serv/lsa_billinfo?year=2001&request= getBill&docno=1250.

Indiana. Pesticide & Toxic Chemical News, Dec. 24, 2001. An Indiana environmental group is increasing pressure on 59 Indiana school districts who have not adopted a model school pesticide-use policy developed by the state's school board association. The policy includes provisions to limit pesticide use when children are present, to require staff training, to provide parents and staff with "right-to-know" information and to ensure proper pesticide storage.
Maine Board of Pesticides Control. Oct. 18, 2002. *The Maine Board of Pesticides Control has adopted a regulation which will require advance notification to parents and staff of pesticide applications, adoption of a school IPM policy by each school board, and appointment of an IPM coordinator for each school. The new regulations apply to all public and private schools serving any grades between and including K through 12 and will go into effect before the start of the 2003-2004 school year. The text of the regulation is available at http://www.thinkfirstspraylast.org/schoolipm.*


Massachusetts, Commonwealth of. 2000. *Children’s and Families’ Protection Act. Addresses notification, requires IPM, restricts the types of pesticides that can be used in schools and daycares, and provides for a statewide registry of pesticide use. Available at http://www.state.ma.us/legis/laws/seslaw00/ s1000085.htm.*

Michigan, Department of Agriculture. *Description of the Natural Resources and Environmental Protection Act 451 of 1994 and Regulation 637. This act requires that before a pesticide application is made in schools, public buildings and health care facilities, a verifiable IPM Program must be in place for each building. Available at http://www.michigan.gov/mda/1,1607,7-125-1568_2391 _2450---CI,00.html.*

Minnesota, State Legislature. Chapter 326, Article 6, Section 18B.063. *States that the state shall use integrated pest management techniques in its management of public lands. Available at http://www.mda.state.mn.us/ipm/MSChap326.htm.*

Minnesota, State Legislature. 2000. *Janet B. Johnson Parents’ Right-to-Know Act of 2000. Schools are required to provide notification only if they apply toxicity category I, II, and III pesticides (classified by the US Environmental Protection Agency) or restricted use pesticides (defined by federal law). http://www.revisor.leg.state.mn.us/slaws/2000/ c489.html#a7.*

New Jersey, State Legislature. 2002. *The New Jersey "School Integrated Pest Management Act," which was introduced in the Assembly as A2841 and referred to the Assembly Environment and Solid Waste Committee on 10/3/02, was subsequently substituted for the original Senate version of the bill, S137 on 10/28/02. On 10/28/02 it unanimously passed both Houses and is currently on the Governor’s desk for his review and signature. His signature is anticipated in the near future. Among other items, it mandates that New Jersey schools each develop and adopt an Integrated Pest Management Policy. See the full text act at http://www.njleg.state.nj.us/2002/Bills/ A3000/2841_I1.HTM.*


New York, State of. 2001. *Senate Bill S01974. Establishes special requirements for pesticide applications in schools; requires pest management plans including provision for integrated pest management techniques and notices to be given to building occupants; applies to grounds as well as buildings and prohibits pesticide applications which are preventative in nature and do not respond to existing, verifiable pest problems. Bill text available at http://assembly.state.ny.us/leg/?bn=S01974.*
New York, State of. 2001. Assembly Bill A6024 is reintroduced as the "children's environmental health and safety bill of rights act", directing the commissioners of health, education and environmental conservation to develop programs and regulations to promote the protection of children from environmental hazards, report to the governor and legislature and provide public access to information about environmental health issues and hazards. Would require creation of a multi-stakeholder advisory council on children's environmental health and safety. Search on bill number at http://assembly.state.ny.us/leg/?bn=A06024.


Pennsylvania. Pesticide & Toxic Chemical News, Vol. 30, No. 14. Alternative pest management has been added to the curriculum of Pennsylvania's public schools. The State Board of Education and the Regulatory Review Commission have adopted academic standards for environmental studies, of which IPM will be a part. On the regulatory side, a bill currently before the Pennsylvania Senate would require advance notification of pesticide applications within schools and on school grounds, athletic fields and playgrounds. It also would require notification for the implementation of IPM programs in schools.

Pennsylvania, Senate Bill 705. 18 Apr. 2002. Sponsored by Sen. Stewart Greenleaf (R-Bucks), the bill amends the Public School Code by adding a section addressing integrated pest management programs. The legislation requires schools to adopt integrated pest management plans in accordance with the integrated pest management policies or regulations of the Department of Agriculture. The schools are required to adopt an integrated pest management plan by Jan. 1, 2003. The bill also places responsibilities on the Department of Agriculture to assist schools in the development, planning and preparation of the integrated pest management plan. The bill passed unanimously and is effective immediately. Bill text available at http://www.legis.state.pa.us/WU01/LI/Bl/ BT/2001/0/SB0705P1860.HTM.

Pennsylvania Senate Bill 705, proposed to amend the Public School Code of 1949, providing for advance notification of pesticide application within schools, school grounds, athletic fields and playgrounds. Bill text and status at http://www.legis.state.pa.us/WU01/LI/Bl/ALL/2001/0/SB0705.HTM.

Pennsylvania State IPM Program. 2002. Public schools across Pennsylvania will have until the end of the year, 2002, to comply with new legislation requiring them to give notification before applying pesticides and to adopt integrated pest management (IPM) plans. To help schools meet the deadline, the Pennsylvania IPM Program (PA IPM) has prepared information packets and sent them out to every school district in the state. To read a full text article on this partnership, go to http://www.ipminstitute.org/PA_IPM_Partnership_article.htm.

Rhode Island, State of. 2001. Rhode Island School Pest Management Act of 2001. Proposed bill would create a state school IPM advisory board and require school districts to implement IPM systems including posting and notification, restrict use of certain pesticides and apply monetary penalties collected as a result of violations to IPM education. http://www.rilin.state.ri.us/billtext/ billtext01/senatetext01/s0660.htm


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SEPA. 2002. The School Environment Protection Act (SEPA) is part of the Senate passed farm bill. SEPA was revived after being defeated by the Education Conference Panel as an amendment to the education bill. In response to Congressional concern, language was added to SEPA to clarify that mosquito and fire ant abatement districts will not be impacted by the legislation. To see SEPA highlights and model schools, please see full text of http://www.pestlaw.com/x/law/SEPA-HR1.html.


U.S. House of Representatives. 2003. National legislation that would require schools to implement Integrated Pest Management programs has been introduced in congress, this time by Rep. Rush Holt (D-N.J.). The School Environmental Protection Act of 2003 (HR121) would also require school districts to notify parents and employees in advance of pesticide applications in schools. The bill was introduced on Jan 7, 2003, and was referred to the Subcommittee on Conservation, Credit, Rural Development and Research on January 28. To read the full version of the bill or a summary, or to check on its current status, visit the Thomas website at http://thomas.loc.gov and enter the bill number HR121 under “search.”


U.S. Senate Bill S.1716, 2000. School Environment Protection Act, Proposed legislation would require annual notification of schools pest management practices including pesticides used; specify that least-toxic methods be used with pesticides as a last resort; and create a 12-member School IPM Advisory Board to develop a list of acceptable pesticides and uniform standard for IPM implementation in schools. Bill text and bill summary available at http://schoolipm.ifas.ufl.edu/sepa.htm.

Vermont, Department of Social and Rehabilitative Services (SRS). "Early Childhood Program Licensing Regulations." Regulations state that pesticides shall be used only when other pest prevention and control measures fail and pesticides shall not be used to control pests for aesthetic reasons alone. The regulations also require that staff and parents of children shall be notified in writing prior to any planned application of pesticides. Notice shall include the site of the planned application, the pest(s) to be treated for, and proposed pesticide(s) to be used. The application of pesticides, when necessary, is restricted to times when children are not present. PDF version of regulations available at http://www.state vt.us/srs/childcare/licensing/license.htm.


Washington, State of. 2001. SB 5533. Posting and notification of pesticide applications at schools. Requires day care centers and public elementary and secondary schools to provide certain notices of its pest control policies and methods and to provide notice of and post signs regarding applications of pesticides to its buildings and property, and provides exemptions from this requirement; and expands the types of applications of pesticides to other landscapes for which notification markers must be placed and regarding which records must be kept. http://www.leg.wa.gov/wsladm/billinfo/dspBill Summary.cfm?billionumber=5533


Wisconsin Department of Agriculture, Trade and Consumer Protection. http://folio.legis.state.wi.us/cgi-bin/om_isapi.dll?clientID=227879&infobase=stats.nfo&1=94.715&jump=94.715&softpage=Browse Frame_Pg is a link to the statutes governing pesticide use at public schools and School Board responsibilities.


School Pest Management Practice Surveys


Braband, Horn and Sahr. 2002. Pest Management Practices: A survey of public school districts in New York State. This 21-page bulletin presents results from 603 completed surveys representing 741 districts in New York. The survey was jointly developed and administered by the NYS Education Department, the NYS Department of Health, and the NYS Community IPM Program. It is not yet available online. For copies, contact NYS IPM Program, NYSAES, Geneva, NY 14456, and refer to publication NYS IPM Number 613. Available at http://www.nysipm.cornell.edu/comm/school.html.


Delahaut, Karen. 2001. "Wisconsin's program for school pest management protects children." Over 67 percent of Wisconsin's schools have participated in Integrated Pest Management, or IPM programming in an effort to reduce health risks to children. A total of 1,395 schools had voluntarily participated in the program by August and new state legislation on pesticide use in schools was enacted in September. Available at http://www1.uwex.edu/news/story.cfm/433.


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Massachusetts Public Interest Research Group, 1996. Primary Exposure: Pesticides in Massachusetts Schools. Studies pesticide use in 18 schools across the state, and offers recommendations for alternatives such as IPM. Available from Mass PIRG, 29 Temple Place, Boston MA 02111. (617) 292-4800, FAX (617) 292-8057, E-mail masspirg@pirg.org, Website http://www.pirg.org/masspirg/index.htm.

Miller, Susanne. 2002. The Vermont Public Interest Research Group, Inc. has funded a new report entitled Reading, Writing and Raid(R) documenting pesticide use in Vermont schools. This 21-page report includes includes an extensive background as well as full report on what Vermont schools and parents can do. The survey is available at http://www.vpirg.org/campaigns/environmentalHealth/pesticide_report.pdf.

Minnesota, Department of Agriculture. 2002. The Minnesota Department of Agriculture, with funding provided by the US EPA, Region 5, recently completed a Pest Management Survey of Day Cares, Head Starts, and Preschools. The survey results and conclusions can be downloaded at http://www.mda.state.mn.us/ipm/ipmpubs.html.


School Pesticide Reform Coalition and Beyond Pesticides. 2003. Safer Schools: Achieving a Healthy Learning Environment Through Integrated Pest Management. With descriptions of 27 school districts of all sizes from 19 states, this report describes a growing commitment to adopt practices that respond to mounting evidence that pesticides pose a public health hazard while non-toxic, economically feasible pest management options are available. Available in pdf format. Hard copies of the report are available for $5.00 each by contacting Beyond Pesticides at 202-543-5450 or info@beyondpesticides.org.


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Waters, Ann et al. 2002. Email dialogue between Ann Waters, Karen Vail, Clay Scherer, Craig Hollingsworth, Eric Althouse and Kathy Murray including information on resources to help survey schools about IPM. Available in word or pdf format.


School IPM Success Stories

Arizona pilot expands to 27 schools in 2001. An initial pilot program in three middle schools in Maricopa County documented a 90% reduction in pesticide use and an estimated 85% reduction in pest pressure. Contact for the project is Dawn Gouge. View summary in PDF format.

Bennett, M. E. Journal of Pesticide Reform. “A Pesticide-free School for a Chemically Sensitive Family in Boise, Idaho.” Discusses the efforts of one family to change the pesticide policy of their school district are described. Stressed is the need to educate teachers, physicians, and students.


Lavendal, Brian. Audubon. “Taking Back the Halls.” Sept./Oct. 2001. Students at Lewis Cass Technical High School in downtown Detroit are taking back the halls. Cass Tech School students are top of their class, but their eight-story school is old, allowing many unwanted critters into the halls. The students at this magnet high school run their own school-wide pest-control science project using IPM. Science teacher Michael Jones traces the students’ IPM program back to a science-fair project in which students in his chemistry class tried to help a homeowner whose house had been infected with termites. Students learned of numerous nontoxic alternatives for controlling pests while also applying for grant money opportunities for student-run IPM programs from the Michigan Department of Agriculture. The student-led IPM team has been successful, noting a “significant decline in the roach population in the first year.” The facilities manager for the school even claims that the students have done a better job in controlling pests than his custodians and contractors ever did. Kathy Seiken. senior policy analyst for the EPA, say the Cass Tech IPM program is "fantastic," urging other schools to take a look at it as an alternative to conventional pest control. It is truly a scenario that "most teachers only dream of, these students put their lessons to work every day... not shy about sharing their expertise at home and in the community."

The Lebanon School Corporation (LSC) in Indiana is currently working with their pest management provider to shift to a full IPM program during the 2003-2004 school year. In March, Al Fournier from Purdue’s IPM Technical Resource Center met with building administrators (principals and assistant principals) to develop a plan for getting building staff on board with IPM.

The Lime Kiln Middle School PTA is continuing to explore alternatives under the ongoing IPM (Integrated Pest Management) initiatives for grounds maintenance at the school. The Howard County Public School System (HCPSS) has agreed to suspend the routine spraying of pesticides to maintain the grounds, if PTA volunteers maintain the landscaped beds. In response, PTA has established a workgroup to organize this effort and coordinate a team of weeding volunteers’ that perform general gardening such as cutting back flowers, pruning, weeding, edging, etc. The Lime Kiln Middle School PTA’s Call for volunteers is available in Word or PDF forms and includes the information for volunteer coordinator Veronika Carella. Phone 410-489-5495 or email at jlcarella@msn.com if you have any questions.
The New York City Board of Education, representing approximately 1200 school buildings, has eliminated indoor dust formulations of every kind to reduce airborne particulates, eliminated all “pelleted” rodenticides to reduce possibility of translocation, eliminated outside rodenticide baitsets opting to bait and close existing burrows only, increased reliance on glue board monitoring as both indicator and precursory control agents, and reduced the use of one class of pesticides from 918 to 22 lbs. per year. Since 1988, the school system has used over 8000 tubes of sealing silicone glue to close potential pest entries. As of the September 2001 school opening, the New York City Board of Education has totally eliminated the use of carbamates, organo-phosphates, pyrethroids, and even pyrethrin treatments anywhere in their buildings. Also, they still use no aerosols of any kind in classrooms and use no dust products whatsoever anywhere in their schools.

A demonstration project at two public schools in Santa Barbara County CA reduced the costs by 30%, and improved effectiveness of the pest control program. More information available from 930 Miramonte Drive, Santa Barbara, CA 93109, Phone: (805) 963-0583, Fax: (805) 962-9080, Email: cecadmin@cecmail.org.

The Monroe County School Corporation, Monroe County IN, implemented a pilot IPM program that eliminated 90% of pesticide applications in three elementary schools. More at http://www.epa.gov/oppbppd1/PESP/strategies/2004/mccsc04.htm.


An IPM curriculum was implemented at Emerson Elementary School in Michigan, and a school IPM program was started in a Saginaw High School in the spring, based on the successful Cass Tech High School model. The IPM training team (from Michigan Dept. of Agriculture and the Michigan Pest Control Association) does monthly trainings of the students and also works with an elementary school in the neighborhood. They held a spring parade in the neighborhood to heighten IPM awareness in the community, and the next day, 200 volunteers began cleaning up pest harborage sites in the neighborhood. The program runs through GAP: the Growth & Afrocentric Program, a broad, community-based effort to improve student health, academics, and future outlook and more information is available at http://www.spsd.net/GAP/Classroom.htm.

Safer Pest Control Project. 2002. Cost of IPM in Schools. 2-page fact sheet includes information on the cost effectiveness of IPM in schools. Comments on Monroe County Schools in Indiana and Susqueanna School in New York, providing information on how much money IPM has saved these schools. Available at http://www.spcpweb.org/schcost.pdf.

In January the Tippecanoe School Corporation in Indiana approved a plan to enhance their existing IPM program with more intensive monitoring and record keeping in all their schools as well as incorporating IPM trainings for staff in the 2003-2004 school year. They have designated an IPM Coordinator and negotiated a new contract with their pest control provider to facilitate the new program.

Three Kyrene schools reduce pesticide applications by 90% and keep pest populations below 85% of their normal level by implementing a pilot IPM program.

**IPM Curricula and Workshop Ideas**


British Society for Plant Pathology. 2004. "aMaizing Plant Disease Game." Simultaneously exercise your plant pathology and gaming skills and intuition in a contest to thwart a nasty virtual pathogen attempting to invade an innocent maize crop. The aim of the online game is to “grow” a maize crop, and do it profitably, with in a range of various input alternatives and a threat of disease capable of destroying the crop. The game, open to all, is on the BSPP website at http://www.bspp.org.uk.

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Cullen, E. 1995. IPM Curriculum for Grades 9-12. 200 pp. IPM basics including monitoring and cultural, physical, biological and least-toxic chemical controls; insect profiles, study programs, case studies, lab experiments, resource list, glossary; designed to be part of a science, chemistry or biology course; emphasis on agricultural, horticultural and garden pests. Available from Bio-Integral Resource Center, P.O. Box 7414, Berkeley CA 94707; (510) 524-2567, FAX (510) 524-1758, E-mail birc@igc.org. Website http://www.birc.org.

Cycling Back to Nature: Food Production and Pesticides. Nationally juried curriculum including food production and environmental and health effects of pesticide use in agriculture; food webs and biological diversity; analysis of agriculture and pesticide use in the U.S.; global demand for food and population trends. Available in print from National 4-H Council, 7100 Connecticut Ave, Chevy Chase MD 20815; (301) 961-2908, FAX (301) 961-2894, E-mail: envstew%smtpgate@fourthcouncil.edu. Information including comments from reviewers available at http://www.reeusda.gov/4h/curricul/da2.htm.

Dunn, G.A. and J. VanDyk. Iowa State Entomology Index: K-12 Educators' Recommended Sites. Links to over 30 Web sites with insect-related curricula, projects and information. Available at http://www.ent.iastate.edu/list/ k-12_educator_resources.html.

Entomological Society of America. Educational resources including Beeswax, an entomological newsletter for kids, seasonal lesson plans including handouts and activities, project ideas, books. Available at http://www.entsoc.org/education/educ_intro.htm.

Environmental Protection Agency. 2003. "Learn to Use Pesticides Safely" (available as a poster or bumper sticker) and "Pesticides Are Meant to Poison These... [BUGS] Not These... [KIDS]" (available in poster format only) now available. Free copies of posters and stickers (bumper sticker size) urging consumers to use pesticides safely are available in both English and Spanish. Recognized for their colorful, eye-catching graphics and message, enlarged versions of these posters and stickers have appeared on trucks and metropolitan buses and trains traveling through the urban sectors of many cities. To order, write U.S. Environmental Protection Agency, Office of Pesticide Programs (7506C), Communication Services Branch, 1200 Pennsylvania Ave., N.W., Washington, DC 20460-0001 or call 703-305-5017. For orders larger than 10 copies, please contact the National Service Center for Environmental Publications (NSCEP) at 1-800-490-9198.

Environmental Protection Agency. Interactive Cockroach Activity Book. The popular pest prevention activity book for children, Help! It’s a Roach!, is now on-line. The activities have been converted to be interactive, to provide a fun way to learn about managing indoor insect pests. The messages of removing food, water, and shelter apply to many pests, not just cockroaches. A Spanish version of the web publication will be available soon. The web version is found at http://www.epa.gov/opp00001/kids/roaches/english/. Paper versions of this book are available from EPA's publication center, http://www.epa.gov/ncepihom/ordering.htm (EPA 735-F-98-016?English and EPA 735-F-01-004?Spanish).

Environmental Protection Agency. Help Yourself to a Healthy Home: Protect your Children's Health. Popular 56-page booklet contains helpful information for parents, grandparents and other care givers. Contains information on environmental contaminants found in many American homes and how to protect your family from risks posed by carbon monoxide, unhealthy drinking waters, poor indoor air quality, lead poisoning, hazardous household products, pesticides, and much more. Available in Spanish as "Contribuya a Tener un Hogar Sano." To order, call Kathy Seikel at 703-308-8272, or email seikel.kathy@epa.gov.

Environmental Protection Agency. Consumer Labeling Initiative. Offers a wealth of information and free promotional items to raise awareness about the importance of reading pesticide products labels. Promotional items available free of charge to the public include rulers, bag clips, and jar openers. Also have developed a number of popular brochures including "Read the Label First! Protect your Household," "Read the Label First! Protect your Garden," "Read the Label First! Protect your Children," and "Read the Label First! Protect your Pets." To order, call 703-305-5017 or send an email request to lormand.mary-jean@epa.gov.
EPA Region 2. 2003. EPA's Region 2 (New York) office has developed a free CD containing several documents relating to IPM in schools: 1) "Pest Control in the School Environment," the popular 1993 EPA publication designed to acquaint readers with IPM as a potential alternative to scheduled spraying of pesticides; 2) "Who Wants to be an IPM Super Sleuth? Integrated Pest Management Activities and Resources for Kids of All Ages" developed by the IPM Institute of North America; 3) "Neato Mosquito," the CD developed by the Centers for Disease Control (CDC) which contains a 4th grade curriculum designed to teach kids about mosquito biology through the use of animation, video images, interactive games, and student projects; and 4) a CDC-developed video about mosquito biology. For copies of this CD, which includes all four items above, e-mail Henry Rupp at rupp.henry@epa.gov or call 732-906-6178.

EPA Region 8 (Denver) and the Girl Scouts Mile Hi Council. A "Bugged by Bugs" pesticide awareness patch has been developed through a partnership between the EPA and Girl Scouts, which reaches more than 36,000 girls between the ages 5-17. This exciting on-line resource can be accessed at http://www.girlscoutsmilehi.org/content/home.cfm The Web site http://www.girlscoutsmilehi.org/content/home.cfm features on-line games, complete word searches and crossword puzzles which kids can tackle while learning more about safe pesticide use, risks and potential health concerns related to pesticides, as well as the IPM approach to pest control.


National School IPM Web site. The CD-ROM contains everything on the Web site including IPM information from IPM experts across the nation that is orientated to administrators, teachers, parents and pest management professionals. It also includes advice on how to develop an IPM program; alternative methods of pest control; information on pests and pesticides safety; news releases on IPM and pests for school newsletters; Powerpoint presentations on; sample contacts and letters; educational materials; links to school related Web site in numerous areas (organized by subject and location); and much more. The web site is now available complete on a CD-ROM for use in stand-alone or networking environments for both PCs and Macs. It requires a CD-ROM drive and graphical browser. The cost of this CD-ROM is $8. Additional copies may be purchased through the UF/IFAS Extension Bookstore by calling 800-226-1764 or on the Web at http://ifasbooks.ufl.edu. Discounts are not available at this price. Funds generated by the sale of this CD-ROM are used to maintain and add to the National School IPM Website.

Kneen, Cathleen. The Community Garden Game is a non-competitive card game designed to increase interest in community gardening. There are 12 vegetables so the game can be played with up to 12 players. With a roll of the dice you may find that the pony club has decided to compost their manure and donate it to the garden -- the whole garden takes a point -- or that a bunch of kids raid the garden -- peas and beans lose one each. You may find that you planted potatoes in the same place as last year and they get scab -- potatoes lose one; or that the community kitchen develops a great bean recipe -- beans take one. There are 40 negative and 40 positive cards, so lots can happen in your garden! The goal of the game is to harvest as much of each vegetable as possible. Order the Community Garden Game for $10 plus $2 for postage from: Cathleen Kneen, S-6, C-27, RR #1, Sorrento, B.C., V0E 2W0, Canada.

Koehler, P., T. Fasulo, C. Scherer and M. Downey, Eds. 1999. School IPM Web Site. University of Florida. Links to IPM curricula from land grant institutions; Introduction to need for IPM in schools; descriptions and links to lesson plan and materials for students and for teachers and 8-week Internet course for teachers; example of school IPM lesson plan; references. Produced by Montana State University. Available at http://schoolipmifas.ufl.edu/teach.htm.

Leon County Mosquito Control. 2002. Mosquito Control Education Program. Education plays a primary role in the integrated pest management program used by Leon County Mosquito Control. Leon Country Mosquito Control has designed a curriculum outline, videos, a school activity book, worksheets, and examples of prizes and more to use when educating children about IPM mosquito control. Available at http://www.co.leon.fl.us/mosquito/index.asp.


Glossary
Published by The IPM Institute of North America, Inc., 1914 Rowley Ave., Madison WI 53726 (608) 232-1528, FAX (608) 232-1530, E-mail ipminstitute@ipminstitute.org, Web site: http://www.ipminstitute.org


Minnesota Department of Agriculture. 2002. Fact sheets. A series of 2-page face sheets dealing with many pests found in schools including an overview, and multiple facts sheets on various insects, weeds, plant diseases, rodents and pesticides. Available at http://www.mda.state.mn.us/IPM/IPMinSchools.html.

Minnesota Department of Agriculture. 2000. Join Our Pest Patrol - A Backyard Activity Book for Kids - An Adventure in IPM. 29-page book and companion third through fifth grade Teachers' Guide, includes many fun activities that can easily be incorporated into reading, science, or even math and art classes. It provides kids and teachers with important information about pest identity and biology, and ecology. Has recently been adapted for nationwide use. Available from Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul MN 55107-2094, more information at http://www.mda.state.mn.us/IPM/IPMinSchools.html. To order, call Kathy Seikel at 703-308-8272 or email seikel.kathy@epa.gov. Bulk orders accepted.


Pennsylvania IPM Program, 2002. "Join Our Pest Patrol" publication. Educational resource for Pennsylvania teachers of students in grades 3 and 4. Addresses newly adopted state academic standards in environment and ecology focusing on integrated pest management. Includes crossword puzzles, fill-in-the-blanks, mazes and picture drawing. Also available is the accompanying teacher guide that includes facts, investigations, activities and resources to support children's curiosity and extended learning. Concepts include distinguishing insect pests from beneficial insects; understanding why humans want to manage pests; recognizing common pests in our homes, gardens and neighborhoods; choosing the least toxic ways to manage pests; and safeguarding against pesticide risks. Can be obtained by contacting the Pennsylvania IPM Program at (814) 865-2839 or downloaded as printable PDF files from the Web at http://paipm.cas.psu.edu Join Our Pest Patrol 4-H Leader Guide now available online. 6-page backyard activity book is formatted for 4-H leaders. Includes a brief description of IPM, a list of common pests, many ideas for projects, information on safe pesticide use as well as an extensive bibliography. Available at http://www.mda.state.mn.us/IPM/ipmpubs.html.


Glossary
Pennsylvania IPM Program, 2003. Video “Bugmobile Vs. The Invasive Species.” The video, hosted and narrated by BugMobile, the talking Volkswagen, identifies the effects of humans and human events on watersheds, explains species diversity, introduces species that are classified as pests in their new environment, and analyzes the benefits to the environment and society associated with alternative practices used in IPM. Geared toward lower and upper secondary students, the video addresses the several categories of the state’s new Academic Standards. Each video includes a lesson plan with content objectives, assessment strategies and procedures. Download the lesson plan free, or, to obtain a copy of the video and lesson plan, send a check or money order for $35 made payable to The Pennsylvania State University to ICT, 119 Ag Administration Building, University Park, PA 16802-2602. Visa and MasterCard orders will be accepted by calling (814) 865-6309. Shipping and handling costs are included in the price. Order Form (PDF)


Purdue University Cooperative Extension Service. 2002. IPM in Schools Activity Book. This 24-page illustrated activity book contains mazes, matching games, coloring activities, connect-the-dots and much more to help kids understand Integrated Pest Management. Also includes an answer key and a “Certificate of Great Work.” The activity book is now available online at http://www.entm.purdue.edu.entomology/outreach/schoolipm/Tch/tch1.htm Requests for hard copies can be sent to Al Fournier, Department of Entomology, Purdue University, Smith Hall, 901 W. State Street, West Lafayette, IN 47907-2054, Phone: 765-496-7520, Email: al_fournier@entm.purdue.edu.


Safer Pest Control Project. Integrated Pest Management in Schools: A Better Method. This 12-minute video is aimed at helping schools, parents, pest control operators, and other groups understand and promote School IPM. Filmed at a Chicago-area school that has practiced IPM since 1994, it features testimony and advice from the school’s pest control operator and operations manager. It addresses concerns about pesticide use, the advantages of practicing IPM, and the basic components of IPM. For more information, see School IPM Video Brochure and Order Form or call Safer Pest Control Project at (312) 641-5575.

Safer Pest Control Project. The Pest Invasion, The Pest Invasion II, and La Invasion de los Insectos II. Three comic books that teach least hazardous pest control in a variety of settings. The Pest Invasion chronicles one family’s successful battle against roaches and rodents in a Chicago Public Housing development. To order for $1.00 each, call The Safer Pest Control Project at 312-641-5575 or email us at msaito@bpchicago.org.


Radcliffe, T.B. and W.D. Hutchison, eds. Radcliffe’s IPM World Textbook. Electronic college-level IPM textbook including line drawings, color and B&W photos, chapters on biological and cultural control, computers in IPM, crop and commodity-specific IPM, ecology, IPM policy, medical and veterinary IPM, pesticides, stored product IPM, links to IPM resources including photographs and decision-support software. Available at http://www.ipmworld.umn.edu/ipmsite.htm.

US EPA. 2002. In commemoration of National Poison Prevention Week, Mar. 17-23, EPA is making available several resources to educate the public about ways to prevent children from being poisoned by pesticides and household products. “Learn About Chemicals Around Your House” is an interactive web site (see: http://www.epa.gov/opptintr/kids/hometour/) designed to teach children and parents about household products, including pesticides, that may contain harmful chemicals. “Read the Label First! Protect Your Kids” is a brochure that provides information on preventing children from being exposed to pesticides and household cleaners by reading and following product label instructions and precautions, keeping products in their original containers, and storing products out of the reach of children and is available online at http://www.epa.gov/opptintr/labeling/rfl/kids.pdf. “Ten Tips to Protect Children from Pesticide and Lead Poisonings Around the Home” is a brochure that provides simple steps to protect children from pesticide and lead poisonings around the home, and is available in both English and Spanish. This document is available at: http://www.epa.gov/opptfed1/cb/10_tips. “Pesticides and Child Safety” is a fact sheet that provides current household pesticide-related

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poisonings/exposure statistics, as well as recommendations for preventing poisonings and first aid guidelines and is available at http://www.epa.gov/pesticides/factsheets/childsaf.htm. Finally, "Help! It's A Roach" is a roach prevention activity book for kids and parents. It teaches families what they can do to prevent and control roaches without using pesticides. An interactive Web site is also available at: http://www.epa.gov/opp00001/kids/roaches/english/. All of these resources are also available by calling 1-800-490-9198. More information on Poison Prevention Week is also available at the Poison Prevention Week Council's website at: http://www.poisonprevention.org/.


University of Connecticut IPM Program. 1999. IPM Online Home Study Courses. Self-paced, tuition-free, non-credit tutorial-type courses with a certificate issued upon completion including IPM for cockroaches, ants/termites, turfgrass, garden weed and insect pests, resistance of woody ornamental plants to deer damage. Available at http://www.canr.uconn.edu/ces/ipm/homecourse/coursinfo.htm.

University of Florida Department of Entomology and Nematology, 2002. Poster on insect-related Web sites. The poster targets K - 12 students and their teachers and lists 12 outstanding Web sites from several universities, government agencies and private individuals, with URLs for many more. Go to the UF/IFAS Extension Bookstore at http://itasbooks.ufl.edu/merchant2/merchant.jsp?Screen=PROD&Store_Code=IFASBOOKS&Product_Code=SP+315 to view it or call (800) 226-1764 to order.


School IPM and Related Resources in Spanish and Other Non-English Languages

Environmental Protection Agency. Contribuya a Tener un Hogar Sano. Popular 56-page booklet contains helpful information for parents, grandparents and other care givers. Contains information on environmental contaminants found in many American homes and how to protect your family from risks posed by carbon monoxide, unhealthy drinking waters, poor indoor air quality, lead poisoning, hazardous household products, pesticides, and much more. To order, call Kathy Seikel at 703-308-8272, or email seikel.kathy@epa.gov.

Environmental Protection Agency. 2003. “Learn to Use Pesticides Safely” (available as a poster or bumper sticker) and “Pesticides Are Meant to Poison These... [BUGS] Not These” [KIDS] (available in poster format only) now available. Free copies of posters and stickers (bumper sticker size) urging consumers to use pesticides safely are available in both English and Spanish. Recognized for their colorful, eye-catching graphics and message, enlarged versions of these posters and stickers have appeared on trucks and metropolitan buses and trains traveling through the urban sectors of many cities. To order, write U.S. Environmental Protection Agency, Office of Pesticide Programs (7506C), Communication Services Branch, 1200 Pennsylvania Ave., N.W., Washington, DC 20460-0001 or call 703-305-5017. For orders larger than 10 copies, please contact the National Service Center for Environmental Publications (NSCEP) at 1-800-490-9198.

EPA 2003. "10 Medidas Para Proteger A Sus Niños De Los Pesticidas Y Del Envenenamiento Debido Al Plomo." This Spanish/English brochure outlines the ten most important steps you can take to protect children from accidental poisonings associated with the presence of lead and pesticides in the home. Available at http://www.epa.gov/oppfod01/cb/10_tips/childesp.htm.
EPA Region 6 (Dallas). 2003. “Tres Amigos al Rescate.” A new education and outreach package aimed at Spanish-speaking communities. The core component of this package is an entertaining and informative video that appeals to children and adults alike and provides practical information on safe use of household chemicals, including pesticides. The video is accompanied by a companion booklet, also in Spanish, designed for parents, teachers, and moderators. A helpful discussion guide and fact sheet complete the package and set the stage for stimulating discussions about steps people can take to make their homes environmentally safe. To order “Tres Amigos al Rescate,” e-mail Amadee Madril at madril.amadee@epa.gov or call 214-665-2767.

Drlit, T. Spanish IPM fact sheets include Argentine ants, cockroaches. Bio-Intergral Resource Center, P.O. Box 7414 Berkeley, CA 94707, phone (510) 524-8404.


National Pest Management Association. Pest management materials, including biology and management of bumblebees, carpenter ants, fruit flies, German cockroaches, head and body lice, and pavement ants, plus diseases transmitted by pests. All are able to be translated into Spanish, Chinese, French, German, Italian, Japanese, Korean, or Portuguese. Available at http://www.pestworld.org.


Pennsylvania IPM Program. 2004. “Unete a Nuestra Patrull contra las Plaga.” Translated version of “Join Our Pest Patrol” publication is fun, educational resource for Pennsylvania teachers of students in grades 3-4. Like the English version, the workbook is designed to serve two audiences; elementary school students who must learn about IPM to meet the new Academic Standards in environment and ecology, section 4.5.4, “Integrated Pest Management,” and kids in 4-H programs. Copies of the Join Our Pest Patrol/publication in Spanish can be downloaded as printable PDF files from the PA IPM Program's web site at http://paipm.cas.psu.edu/pestpatrol.html.


Texas Agricultural Extension Service. Entomology Spanish language publications, includes Cockroaches, How to Control Cockroaches at Home, Control of Rats And Mice, Fleas, Flea Control, House Infesting Ants, How to Control Ants at Home, Subterranean Termites, The Two Step Fire Ant Control, Ticks, Tick Control. Available at http://tcebookstore.org/browse.cfm?catid=162.

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UMASS. What is Integrated Pest Management? This informative brochure is available through the University of Massachusetts in nine different languages including English, Spanish, Portuguese, French, German, Italian, Khmer, Vietnamese and Chinese. Available at http://www.umass.edu/umext/ipm/ipm_projects/school.html.


University of Nebraska Cooperative Extension. Head Lice Resources You Can Trust. Family guide with practical, simple directions on head lice control in Spanish and English. Also includes online “Removing Head Lice Safely” video in both Spanish, Arabic and English. Available at http://lancaster.unl.edu/enviro/HeadLice/Resources.htm.

US EPA. 2004. Proper household pesticide storage and disposal in Spanish. Spanish-speaking individuals can now view in Spanish EPA’s household consumer information on proper pesticide storage and disposal. To access, visit http://www.epa.gov/pesticides/regulating/storage.htm and click on the “En espanol” button above the “Quick Resources” box.

US EPA. Pest management materials in Spanish include “Ten Tips to Protect Children from Pesticides and Lead Poisonings around the Home” (tri-fold brochure); “Pesticides and Child Safety” (3-page tip sheet); “How to Protect Children from Environmental Threats” (brochure, IPM plus other issues, very attractive presentation and practical tips); “Pesticides and Food: What Your Family Needs to Know.” Request in print by phone to 703-305-7666 Fax: 703 308-2962.


US EPA. 2002. Socorro! Una Cucaracha! (Help! It’s a Roach!). The Spanish version of the popular pest prevention activity book for children is now on-line. The activities have been designed to be interactive, to provide a fun way to learn about managing indoor insect pests. The messages of removing food, water, and shelter apply to many pests, not just cockroaches. The web version is found at http://www.epa.gov/pesticides/kids/roaches/spanish. Paper versions are available from EPA’s publication center, http://www.epa.gov/ncepihom/ordering.htm (EPA 735-F-98-016?English and EPA 735-F-01-004?Spanish).

University of Wisconsin’s Home*Asyst. 2003. Free copies of the Spanish version of “Help Yourself to Healthy Home” (Contribuya a Tener un Hogar Sano) are now available. This booklet is geared for the consumer and answers important questions about the home and how you live in it. Every chapter provides basic information about a particular environmental issue, e.g. indoor air quality, pesticides, carbon monoxide, lead, mold and moisture, etc. Interested in copies, e-mail Kathy Seikel at seikel.kathy@epa.gov or call 703-308-8272.

Organizations with Resources for School IPM

Note: Organizations listed under state headings may have resources available and applicable to users outside of the state. No effort has been made to screen entries and no endorsement is implied. The user bears all responsibility for verifying the accuracy and propriety of information obtained from Web sites, publications, etc. For the latest version of this directory, see http://schoolipm.ifas.ufl.edu/ipm_org.htm.

NATIONAL

Government/University/Extension

UNIVERSITY OF FLORIDA, Dr. Philip Koehler, Urban Pest Specialist, Entomology and Nematology Department, Bldg 970, Natural Area Drive, Gainesville FL 32611-0640, (352) 392-2484, Fax (352) 846-1500, E-mail: pgk@gnv.ifas.ufl.edu.

Applicator training; advice to schools districts and pest management professionals; sample/model IPM documents (e.g., contracts, policies); E-mail list server; Website http://schoolipm.ifas.ufl.edu/ including pest management techniques from national authorities, downloadable presentations, how-to start an IPM program and sample documents.
US EPA, Office of Pesticide Programs, Kathy Seikel, Senior Policy Analyst, Biostatistics and Pollution Prevention Division, MC 7511C, 1200 Pennsylvania Ave. NW, Washington DC 20460, (703) 308-8272, Fax (703) 308-7026, E-mail seikel.kathy@epa.gov.

Citizen’s Guide to Pest Control and Pesticide Safety (EPA Pub # 730-K-95-001, September 1995); Pest Control in the School Environment: Adopting IPM (EPA Pub # 735-F-93-012, August 1993); order free of charge through EPA’s National Service Center for Environmental Publications at 1-800-490-9198 or at http://www.epa.gov/ncepihome.publication center

Non-governmental, non-profit organizations

BEYOND PESTICIDES/NATIONAL COALITION AGAINST THE MISUSE OF PESTICIDES (NCAMP), Kagan Owens, Program Director, 701 E Street, S.E., Suite 200, Washington DC 20003, (202) 543-5450, Fax (202) 543-4791, E-mail kowens@beyondpesticides.org.

Resources for parents, activists, school administrators on the hazards of school pesticide use and their alternatives; model school policies and laws; resources on IPM, pesticide bans and right-to-know programs on local, state and federal level; information on pesticide poisoning incidents and how to document; membership; quarterly newsletter: Pesticides and You; monthly publication: Technical Report; annual national pesticide conference; Web site, http://www.beyondpesticides.org.

CENTER FOR HEALTH, ENVIRONMENT AND JUSTICE, Deb Benyik, Children’s Health Coordinator, P.O. Box 6806 Falls Church, VA 22040, (703) 237-2249, E-mail: dbenyik@chej.org.

Site-specific technical assistance to communities with environmental problems; publications: Gold Standard, school IPM guidelines, an effort of the Poisoned Schools: Childproofing Our Communities campaign, comprised of local, state and national children’s environmental health activist groups; newsletter: Everyone’s Backyard; membership; Web site: http://www.childproofing.org.

HEALTHY SCHOOLS NETWORK INC., Claire Barnett, Executive Director, 773 Madison Avenue, Albany NY 12208, (518) 462-0632, E-mail: Healthyschools@aol.com.

Kick the Pesticide Habit, 8 pp. guide for parents and others in the school community linking child environmental health research and school facility information to practical steps schools can take to pest-proof facilities and reduce pesticide use; advocacy for improved school facility conditions and practices; assistance for parents of allergic, asthmatic, and chemically sensitive students; peer and technically reviewed guides, fact sheets, packets on a variety of indoor environmental problems in institutions serving children on cleaning products, access to public information, renovation vs health, health & safety committees, molds, carpeting, and more; Web site: http://www.hsnet.org.

IPM INSTITUTE OF NORTH AMERICA, INC., Dr. Thomas Green, President, 1914 Rowley Ave., Madison WI 53726, (608) 232-1528, Fax (608) 232-1530, E-mail: ipminstitute@ipminstitute.org.

IPM certification; membership; newsletter; IPM Standards for Schools, 124 pp. school IPM checklist with more than 700 IPM practices and 250 resources for schools implementing IPM including model documents, how-to resources for planning, communication, pesticide risk management, non-chemical controls for school buildings and grounds; IPM verifier training; Web site: http://www.ipminstitute.org including IPM Standards in html and PDF formats and brand name list of least-impact pest control options.

ALABAMA
Government/University/Extension

IPM ALABAMA PROGRAM, Mark A. Rumph, Coordinator, Alabama IPM in Schools Project, 207 Extension Hall, Auburn University AL 36849, (334) 844-6390, E-mail: mmrumph@aces.edu.

Applicator training (through the Alabama Pest Control Association); advising to schools, PCOs, any other interested groups; model IPM program; newsletters tailored for schools; Web site http://www.aces.edu/schoolipm.

CALIFORNIA
Government/University/Extension

SCHOOL IPM PROGRAM, Department of Pesticide Regulation, California Environmental Protection Agency, 830 K Street, Sacramento CA 95814-3510, (916) 324-4100, Fax (916) 324-4088, E-mail: schools@empm.cdpr.ca.gov.

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IPM Guidebook and web-based resources on IPM and pesticides for schools, parents, teachers; training-the-trainers in school districts; assessing IPM adoption assessment; model school sites development; California legislation requires annual parental notification, parental advisory of individual pesticide applications upon request and posting of pesticides applications with record keeping; Web site: http://www.cdpr.ca.gov.

Non-governmental, non-profit organization

BIO-INTEGRAL RESOURCE CENTER, William Quarles, Executive Director, PO Box 7414, Berkeley CA 94707; (510) 524-2567; Fax (510) 524-1758, E-mail: birc@igc.org.

Membership; training programs; newsletters; IPM Practitioner, Common Sense Pest Control Quarterly and more than 100 publications on IPM and reduced-risk pest control; IPM school manual; IPM curriculum; 52-page reduced-risk product list.

COMMUNITY IPM COUNCIL, Phil Boise, IPM/Agronomy Programs Manager, 930 Miramonte Dr., Santa Barbara CA 93109, (805) 963-0583 x150, Fax (805) 962-9080, E-mail: Pboise@rain.org.


CONNECTICUT
Government/University/Extension

UNIVERSITY OF CONNECTICUT, Dr. Richard A. Ashley, IPM Coordinator, Department of Plant Science, 1376 Storrs Road, U-67, Storrs CT 06269-4067, (860) 486-3438, Fax (860) 486-4562, E-mail: rashley@uconn.edu.

Resources for commercial growers, home gardeners, and school administrators; IPM information for turf, invasive species, weeds; online IPM homestudy courses and publications ordering; Web site: http://www.canr.uconn.edu/ipm.

FLORIDA
Government/University/Extension

UNIVERSITY OF FLORIDA, Dr. Philip Koehler, Urban Pest Specialist, Entomology and Nematology Department, Bldg 970, Natural Area Drive, Gainesville FL 32611-0640, (352) 392-2484, Fax (352) 846-1500, E-mail: pgk@gnv.ifas.ufl.edu.

Applicator training; advice to schools districts and pest management professionals; sample/model IPM documents (e.g., contracts, policies); E-mail list server; Web site: http:schoolipm.ifas.ufl.edu/ including pest management techniques, downloadable presentations, how-to start an IPM program and sample documents.

IOWA
Government/University/Extension

IOWA STATE UNIVERSITY, Pest Management & the Environment, Dr. Mark H. Shour, 109 Insectary, Ames IA 50011, (515) 294-5963, Fax (515) 294-8027, E-mail: mshour@iastate.edu.

Applicator training; advice to schools districts and pest management professionals.

ILLINOIS
Government/University/Extension

SCHOOL IPM TECHNICAL RESOURCE AND INFORMATION CENTER, Entomology Department, Purdue University, Mr. Al Fournier, School IPM Coordinator, 1158 Smith Hall, West Lafayette IN 47907-1158, (765) 496-7520, Fax (765) 494-0535, E-mail: al_fournier@entm.purdue.edu.

Advice to schools, pest management professionals in Indiana and Illinois via hotline (1-877-668-8IPM); workshops for school administrators, staff, pest control professionals; pilot programs operating in 3 model school districts and 4 childcare facilities.

Non-governmental, non-profit organization

SAFER PEST CONTROL PROJECT (SPCP), Jessica Bullen, Program Associate, 25 E. Washington, Suite 1515, Chicago IL 60602, (312) 641-5575, Fax (312) 641-5454, E-mail: jbullen@bpichicago.org.
Resources for parents, teachers, and schools on IPM; sample IPM materials including sample notification and model policy; newsletter; IPM Handbook and comic book about IPM (English and Spanish); workshops on residential, garden, and school IPM; Web site: http://www.spcpweb.org.

INDIANA
Government/University/Extension

SCHOOL IPM TECHNICAL RESOURCE AND INFORMATION CENTER, Entomology Department, Purdue University, Mr. Al Fournier, School IPM Coordinator, 1158 Smith Hall, West Lafayette IN 47907-1158, (765) 496-7520, Fax (765) 494-0535, E-mail: al_fournier@entm.purdue.edu.

Advice to schools, pest management professionals in Indiana and Illinois via hotline (1-877-668-8IPM); workshops for school administrators, staff, pest control professionals; pilot programs operating in 3 model school districts and 4 childcare facilities.

MAINE
Government/University/Extension

MAINE DEPT OF AGRICULTURE, FOOD AND RURAL RESOURCES, Dr. Kathleen Murray, IPM Entomologist, 28 State House Station, Augusta ME 04333, (207) 287-7616, Fax (207) 624-5065, E-mail: Kathy.Murray@state.me.us.

Advising to parents, schools, pest management professionals; model IPM policy; publications: What's Bugging Our Schools? Pest Concerns and Pesticide Use in Maine Public Schools: Report of the School Integrated Pest Management Survey, Maine School IPM Outdoor Turf and Pest Management Guide; workshops: On-Site Training Program, a 3-hr presentation to school staff and administrators on IPM objectives and how to develop and implement an IPM program in schools.

MAINE BOARD OF PESTICIDES CONTROL, Gary Fish, 28 State House Station, Augusta ME 04333, (207) 287-2731, Fax (207) 287-7548, E-mail: gary.fish@state.me.us.

Applicator licensing and certification; consulting/advising to parents, schools, pest management professionals; newsletter: publications (pamphlets, fact sheets); workshops and conferences (Turf IPM, Structural IPM, Ornamental IPM and other one-day seminars offered annually); Web site: http://www.state.me.us/agriculture/pesticides.

UNIVERSITY OF MAINE COOPERATIVE EXTENSION PEST MANAGEMENT OFFICE, Dr. Jim Dill, IPM Coordinator, 491 College Avenue, Orono, ME 04469, (207) 581-3880, Fax (207) 581-3881, E-mail: jdill@umext.maine.edu.

Applicator training; applicator certification; consulting/advising to parents, schools, pest management professionals; publications (pesticide applicator training manuals, insect and disease fact sheets); workshops/conferences (various pest management workshops offered); insect and plant disease diagnostic service; Web site: http://www.umext.maine.edu/topics/pest.htm.

MARYLAND
Government/University/Extension

MARYLAND DEPARTMENT OF AGRICULTURE, Pesticide Regulation Section, Mary Ellen Setting, Chief or Ed Crow, Program Coordinator, 50 Harry S. Truman Parkway, Annapolis MD, 21401, (410) 841-5710, Fax (410) 841-2765, E-mail: settingm@mda.state.md.us and crowea@mda.state.md.us.

Regulatory and reference materials: regulations, regulation summaries, sample notices, sample IPM plan, IPM Guidelines, Contracting Guidelines, IPM training manual, supplemental manual on IPM principles and practices, Yellowjackets and IPM, establishing action thresholds, IPM information sheets; Website: http://www.mda.state.md.us.

MASSACHUSETTS
Government/University/Extension

UMASS EXTENSION, School IPM Program, Reginald Coler, Coordinator, Department of Entomology, Fernald Hall, University of Massachusetts, Box 32410, Amherst, MA 01003-2410. (413) 577-3976, FAX (413) 545-5858, E-mail: rcoler@ent.UMass.edu.

Applicator training; advising and workshops for schools, pest management professionals.

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MINNESOTA

Government/University/Extension

MINNESOTA DEPARTMENT OF AGRICULTURE, Jean Ciborowski, Integrated Pest Management Program Coordinator, Agricultural Development Division, 90 West Plato Boulevard, St. Paul MN 55107-2094, (651) 297-3217, Fax (651) 297-7678, E-mail: jeanne.ciborowski@state.mn.us, Applicator certification contact person: John Wagner, Agronomy and Plant Protection Division, (651) 297-7122, E-mail: john.wagner@state.mn.us.


UNIVERSITY OF MINNESOTA EXTENSION SERVICE, Dean Herzfeld, Minnesota Health, Environmental, and Pesticide Safety and Pesticide Applicator Training Coordinator, 495 Borlaug Hall, 1991 Upper Buford Circle, St. Paul MN 55108, (612) 624-3477, Fax (612) 625-9728, E-mail: deanh@umn.edu.


MINNESOTA DEPARTMENT OF CHILDREN FAMILIES AND LEARNING maintains a searchable database listing pesticides and their EPA toxicity category at http://cfls.state.mn.us/pesticide.

MONTANA

Government/University/Extension

MONTANA STATE UNIVERSITY, Will Lanier, IPM Assistant, 422 Leon Johnson Hall, Bozeman, Montana, 59717, (406) 994-5690, Fax (406) 994-6029, E-mail: wlanier@montana.edu.

Applicator training; advice to schools, pest management professionals; sample/model IPM documents; e-mail list server; Web site http://IPM.montana.edu including pest management techniques from national authorities, downloadable presentations, how-to start an IPM program and sample documents, lesson plans for middle school science teachers to incorporate school IPM into science classes.

NEW JERSEY

Government/University/Extension

RUTGERS COOPERATIVE EXTENSION Pest Management Office, Dr. George Hamilton, 93 Lipman Drive, Rutgers University, New Brunswick NJ 08901, (732) 932-9801, Fax (732) 932-729, E-mail: hamilton@aesop.rutgers.edu.

Applicator training; advising to schools and pest management professionals; IPM certification criteria, sample/model IPM documents (e.g., contracts, policies).

Non-governmental, non-profit organization

NEW JERSEY ENVIRONMENTAL FEDERATION, Jane Nogaki, IPM Program Coordinator, 223 Park Avenue, Marlton NJ 08053, (856) 767-1110, Fax (856)768-6662, E-mail: janogaki@etcomm.net.

IPM advising to parents, teachers, schools; model notification and IPM policies; IPM training workshops for lawn care, schools, urban settings; listing of NJ schools using IPM; materials on lawn care, indoor pest control, mosquito control; Web site: http://www.cleanwateraction.org/njef.
NEW YORK

Government/University/Extension

CORNELL COMMUNITY IPM PROGRAM, Lynn Braband, Extension Associate, New York State Agricultural Experiment Station, Geneva NY 14456-0462, (800) 635-8356, (315) 787-2408, Fax (315) 787-2360, E-mail: lab45@cornell.edu; LONG ISLAND: Dr. Jody L. Gangloff, IPM Area Specialist, Cornell Cooperative Extension, 1425 Old Country Road, Bldg. J, Plainview NY 11803, (516) 454-0900 ext. 270, Fax (516) 454-0365, E-mail: jlg23@cornell.edu.

Applicator training; advising to schools and pest management professionals; funding for school IPM projects; newsletter; publication: IPM Workbook for New York State Schools; workshops; demonstration and applied research projects; Web site: http://www.nysaes.cornell.edu/ipmnet/ny/urban/ includes IPM Workbook for New York State Schools and several other publications.

OHIO

Government/University/Extension

OHIO STATE UNIVERSITY IPM PROGRAM, Margaret F. Huelsman, Extension Associate, 1991 Kenny Road, Columbus OH 43210, (614) 688-8431, Fax (614) 292-9783, E-mail: huelsman.16@osu.edu.

Applicator training; advising to parents, schools, pest management professionals; sample/model IPM documents; workshops: How to get a school IPM program started in your school district (Spring 2001); Web site: http://www.ag.osu.edu/~ipm.

Non-governmental, non-profit organizations

RURAL ACTION SAFE PEST CONTROL PROGRAM, Heather Cantino, Coordinator, 33 Cable Lane, Athens OH 45701, (740) 594-3338, Fax (740) 593-3228, E-mail: aa734@seorf.ohiou.edu.

Services to Midwest/Appalachia/Ohio; advising to schools, pest management professionals, IPM advocates; sample IPM documents including teacher education materials, IPM principles and implementation guidelines, pest prevention checklists, home safe pest control strategies; workshops/presentations for school officials, teachers, and parents on IPM rationale, methods, techniques, implementation goals and process; Web site http://www.ruralaction.org/ipm.html, including downloadable sample documents.

PENNSYLVANIA

Government/University/Extension

PENNSYLVANIA DEPARTMENT OF AGRICULTURE, Lee B. Bentz, IPM Coordinator, 2301 N. Cameron St., Harrisburg PA 17110-9408, (717) 772-9408, Fax (717) 783-3275, E-mail: lbentz@state.pa.us; Dr. Ed Rajotte, IPM Coordinator, The Pennsylvania State University, 501 ASI, University Park PA 16802, (814) 863-4641, Fax (814) 865-3048, E-mail: egrajotte@psu.edu.

Advice to school districts and pest management professionals; sample IPM documents (e.g., contracts, policies); publications: Common Household Insects, Pyramid of IPM Tactics for Schools; video: Insects and Spiders and Mites Oh My!, quarterly newsletter; workshops for teachers; Web site: http://paipm.cas.psu.edu.

TENNESSEE

Government/University/Extension

UNIVERSITY OF TENNESSEE AGRICULTURAL EXTENSION SERVICE, Karen M. Vail, Urban Entomologist, Entomology and Plant Pathology Department, 218 Plant Science Building, 2431 Center Drive, Knoxville TN 37996, (865) 974-7138, Fax (865) 974-8868, E-mail: kvail@utk.edu.

Advising to parents, schools, and pest management professionals; sample IPM documents (e.g., contracts, policies); publications: Suggested Guidelines for Managing Pests in Tennessee's Schools: Adopting Integrated Pest Management (PB1603), Integrated Pest Management of Landscapes (PB 1639); workshops/conferences for school officials, pest management professionals and school plant managers; Web site: http://www.utextension.utk.edu/pbfiles/pb1603.pdf.

Glossary

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(608) 232-1528, FAX (608) 232-1530, E-mail ipminstitute@ipminstitute.org, Web site: http://www.ipminstitute.org
TEXAS
Government/University/Extension

TEXAS AGRICULTURAL EXTENSION SERVICE, Dr. Michael Merchant, Associate Professor and Extension Urban Entomologist, Texas A&M University Center, 17360 Coot Road, Dallas TX  75252-6599, (972) 231-5362, Fax (972) 952-9632, E-mail: m-merchant@tamu.edu.

IPM Coordinator training; applicator training; CEU training; advice to schools districts and pest management professionals; sample/model IPM documents (e.g., contracts, policies); publications: Pest Control in Texas Schools. Adopting Integrated Pest Management. B-6015; ABCs of IPM video training modules for school districts, includes an introductory video on IPM for schools; IPM Posters.

WASHINGTON
Government/University/Extension

WASHINGTON STATE UNIVERSITY PUYALLUP, Carrie R. Foss, Pesticide Education and Dr. Art Antonelli, Extension Entomologist, 7612 Pioneer Way, E. Puyallup WA  98371-4998, (253) 445-4577 and (253) 445-4545, Fax (253) 445-4569, E-mails: cfoss@wsu.edu and antonell@wsu.edu.

WASHINGTON STATE DEPARTMENT OF AGRICULTURE, Dr. Dan Suomi, Agricultural Chemical Specialist, P.O. Box 42589, Olympia WA  98504, (360) 902-2044, E-mail: dsuomi@agr.wa.gov.

Non-governmental, non-profit organization

WASHINGTON TOXICS COALITION, Cheryl Holzmeyer, Healthy Schools Campaign Coordinator, 4649 Sunnyside Ave. N, Suite 540-East, Seattle WA  98103, (206) 632-1545 x11, Fax (206) 632-8661, E-mail: cholzmeyer@watoxics.org.

Advising to parents, school districts, and others seeking to reduce pesticide use in schools; membership; sample/model IPM documents (e.g., contracts, policies); newsletter: Alternatives; reports and fact sheets including Toxic by Design: Why We Need to Reduce Pesticide Use NOW, Healthy Homes for Healthy Kids, Weed Wars: Pesticide Use in Washington Schools, and others including a series designed for professional landscapers; Toxics Hotline (800) 844-SAFE; Web site: http://www.watoxics.org including Seven Steps to Reducing Pesticide Use in Schools, and a model least-toxic IPM policy.

WEST VIRGINIA
Government/University/Extension

WEST VIRGINIA DEPARTMENT OF AGRICULTURE, Pesticide Regulatory Programs, Dr. Peggy K. Powell, Certification/Compliance Assistance Supervisor, 1900 Kanawha Blvd East, Charleston WV 25305-0190, (304) 558-2209, Fax (304) 555-2228, E-mail: ppowell@ag.state.wv.us.

Applicator training and certification; advising to parents, schools and pest management professionals; West Virginia Title 61, Series 12J Rules for IPM Programs in Schools and Day Care Centers; bulletins and fact sheets.

WISCONSIN
Government/University/Extension

WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE, AND CONSUMER PROTECTION, Brian Becker, School IPM Specialist, PO Box 8911, Madison WI 53708-8911, (608) 224-4547, Fax (608) 224-4656, E-mail: brian.becker@datcp.state.wi.us.


UNIVERSITY OF WISCONSIN, Department of Horticulture, Dr. John Stier, Asst. Professor, 1575 Linden Drive, Madison WI 53706, (608) 262-1624, Fax (608) 262-4743, E-mail: jstier@facstaff.wisc.edu; Department of Entomology, Karen Delahaut, IPM Outreach Specialist, 1630 Linden Drive, Madison WI 53706, (608) 262-6429, Fax: (608) 262-3322, E-mail: kdelahau@facstaff.wisc.edu; Dr. Chris Williamson, Turfgrass Entomologist, 1630 Linden Drive, Madison WI 53706, (608) 262-4608, Fax (608) 262-3322, E-mail: rewille@entomology.wisc.edu; Phil Pellitteri, Insect Diagnostician and Indoor Pest Specialist, 1630 Linden Drive, Madison WI 53706, (608) 262-6510, Fax (608) 262-3322, E-mail: pellitte@entomology.wisc.edu.

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(608) 232-1528, FAX (608) 232-1530, E-mail ipminstitute@ipminstitute.org, Web site: http://www.ipminstitute.org
Applicator training (Turf and Landscape category 3.0 and Structural Pest Control category 7.1); advising and workshops for schools and pest management professionals; Web site http://ipcm.wisc.edu/programs/school; including Wisconsin's School Integrated Pest Manual with sample IPM documents.

School Pest Management in the News

These headlines were culled from a search of articles in U.S. publications containing the words “school” plus “pest,” “pesticide,” or “integrated pest management” between 1/17/2003 to 05/29/2003. To read the complete articles, most newspaper Web sites permit searching for recent articles free of charge, and archive searches for a fee.

“DANGERS IN THE AIR: CHILDREN ARE THE SUBJECTS OF UNCONTROLLED INDUSTRIAL EMISSIONS EXPERIMENT, EXPERTS FEAR,” National Post, 13 July 2004

“BATS BEING REMOVED FROM HATTIESBURG HIGH,” Associated Press Newswires, 07:53, 12 July 2004

“32 THAI CHILDREN SENT TO HOSPITAL AFTER DRINKING BEVERAGE,” Xinhua News Agency, 29 June 2004

“STUDENTS LOBBY AGAINST PESTICIDES; ORANGEVILLE YOUNGSTERS COLLECT 300...,” The Toronto Star, 28 June 2004

“STOP PESTICIDE ABUSE,” Edmonton Journal, 24 June 2004

“PRANK SENDS 11 TO HOSPITAL...,” The Toronto Star, 16 June 2004

“POISONS TAINT NEW SCHOOL SITE...,” Orlando Sentinel, 15 June 2004

“PESTICIDES ARE FOUND FRUIT GIVEN TO SCHOOLCHILDREN,” Western Morning News, 14 June 2004

“IT’S NOT EASY BEING GREEN...,” Calgary Herald, 30 May 2004

“PESTICIDE FILINGS NOT POURING IN...,” Worcester Telegram & Gazette, 25 May 2004

“MOST SCHOOLS IGNORE PESTICIDE LAW AUDIT...,” The Boston Globe, 25 May 2004

“SCHOOL: FIELD MICE NO LONGER A PROBLEM...,” Greensboro News & Record, 20 May 2004

“PESTICIDE SPILL PROMPTS EVACUATION...,” San Bernardino County Sun (KRTBN), 20 May 2004

“FUMES MAKE STUDENTS ILL,” Monterey County Herald, 20 May 2004

“THE REGION; FUMES SICKEN STUDENTS IN GRAND TERRACE,” Los Angeles Times, 20 May 2004


“WESTLAND STUDENT PROTECTS RIVER FROM EROSION,” The Detroit News, 12 May 2004

“SCHOOL USE OF PESTICIDES TO BE CURBED,” Asbury Park Press, 4 May 2004

“CHEMICAL DANGERS AT SCHOOLS...,” Seattle Post-Intelligencer, 30 April 2004

“EVERGREEN, B.G. SCHOOLS NOTED FOR PESTICIDE USE,” The Columbian, 30 April 2004

“MARLTON ELEMENTARY SHINES ON EARTH DAY,” Courier-Post, 29 April 2004

“NEW STATE RULES PROTECT STUDENTS FROM PESTICIDES,” The Star-Ledger, 24 April 2004

“MORE TOXIC TESTS SET FOR BROWN-BARGE,” Pensacola News Journal, 20 April 2004

“ENVIRONMENTAL TOXINS; STUDY SHOWS BENEFITS TO NEWBORNS OF FEDERAL BAN ON HOME USE OF TWO INSECTICIDES,” Women’s Health Weekly, 15 April 2004

“CITY FINDS 130 VIOLATIONS AT FIVE SCHOOLS IN LAUSD,” Los Angeles Daily News, 13 April 2004

“MILTON SCHOOL GIVEN CLEAN BILL OF HEALTH...,” The Patriot Ledger, 8 April 2004

“U.S. PLANS STUDY ON ENVIRONMENT AND KIDS,” Associated Press Newswires, 17:30, 5 April 2004

“PEST MANAGEMENT PROFESSIONALS GO ‘BACK TO SCHOOL’...,” Business Wire, 16:43, 29 March 2004

“THE BUG LADY KEEPS LID ON PESTS IN PITTSBURGH SCHOOLS,” Pittsburgh Post-Gazette, 28 March 2004

“SPRAYING WHERE CHILDREN GATHER IS SIMPLY IRRESPONSIBLE,” Santa Fe New Mexican, 28 March 2004

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"CHILDREN HELP SPREAD THE WORD; GROWERS INVOLVE SCHOOLS IN A SUCCESSFUL PROGRAMME TO REDUCE SPRAYING," New Zealand Herald, 15 March 2004


"A SWIPE AT SPRAYERS IN SCHOOL," The News & Observer, 4 March 2004

"SPORTS-LOVING BATS BACK AT SLIDELL HIGH GAME....," Times-Picayune, 2 March 2004

"THE HAIR ITCH PROJECT," The Palm Beach Post, 26 February 2004

"MOSQUITO-BUSTING GADGETS BEING MARKETED," Associated Press Newswires, 06:41, 26 February 2004

"MOSQUITO-BUSTING GADGETS MARKETED TO CONSUMER...," Associated Press Newswires, 25 February 2004

"PESTICIDE-FREE PLAYING FIELDS A HEALTHY GOAL....," Edmonton Journal, 23 February 2004

"HELPING ATTITUDE' AT SCHOOL PAYS OFF YULEE....," The Florida Times-Union, 11 February 2004

"LAKE PARK WEST STRIVES TO ELIMINATE MICE....," Chicago Tribune, 11 February 2004

"COUPLE ASK DEFOREST SCHOOLS TO DROP PESTICIDES," Wisconsin State Journal, 1 February 2004

"EVIDENCE FOUND OF TREE PEST IN VIENNA....," The Washington Post, 29 January 2004

"GROUP THINKING OUTSIDE THE BOX FOR RAT CONTROL," Newsday, 26 January 2004

"CITY TO CLEAN 600 SCHOOLS OVER RODENT PROBLEMS," Chicago Tribune, 23 January 2004

"HOW TO CURB HEAD LICE INFESTATIONS THAT SPREAD RAPIDLY....," PR Newswire, 04:06, 19 January 2004

"LICE BRIGADE' INSPECTS HEADS WEEKLY....," Montreal Gazette, 17 January 2004


"PARENTS OF CHILDREN ATTENDING SOME ELEMENTARY....," Associated Press Newswires, 7 January 2004


"BRIEFING," The Journal News, 2 January 2004

"ASTHMA AND PESTICIDES IN PUBLIC SCHOOLS....," Boston College Env. Affairs Law Review, 1 January 2004
The IPM Continuum

IPM is a collection of practices, all designed to maximize effectiveness and minimize risks associated with pests and pesticides:

- **Monitoring and thresholds.** Actions are taken against pests only when truly necessary, not on a routine basis or regular schedule. Pests are dealt with as problems arise with a focus on monitoring and chemical control. Pest and pesticide risks are reduced by improving timing and pest-specificity of control actions and eliminating routine pesticide applications. Entry Level IPM practices include inspection and monitoring to identify pest levels and conditions favoring pests; accurate identification and diagnosis of problems; and using the minimum effective amount of least-risk pesticides only when pests exceed predetermined levels.

- **Choosing effective, reduced-risk options.** Efforts to reduce pesticide risks include replacement of high-risk pesticides with lesser risk alternatives. Broad-spectrum pesticides, toxic to many different pests, are replaced with selective controls tailored to the pest problem at hand, including non-chemical options. Pesticides, when necessary, are applied at the lowest effective rate and to as limited an area as possible. Responses to insect, disease, weed and other pest problems are coordinated to minimize unfavorable interactions.

- **Establishing long-term, preventive and avoidance strategies.** Implementing solutions to prevent pest problems reduces the need for chemical or non-chemical intervention. Pest management is integrated with structural design and maintenance, sanitation, horticultural practices, personnel training and other key factors to maximize overall performance and minimize risks and environmental impacts. High Level IPM practices include modifying structures to avoid pest problems, new or renovated structure design minimizes pest problems and staff and students are educated to actively participate and share responsibility in preventing and avoiding pest problems.
