Integrated Pest Management for Schools

IPM 70-5 January 2003

Interior Pests: Head Lice

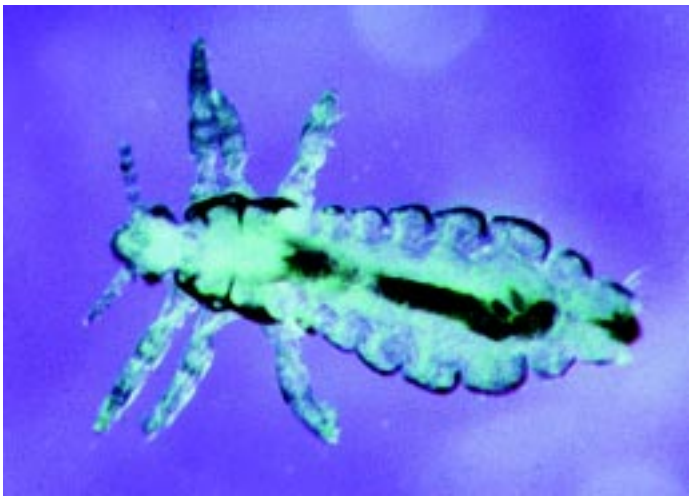
by Ken Holscher, Extension Entomologist, Iowa State University

Head lice infestations have grown dramatically in the past 10 years and are a problem in many school districts throughout Iowa. The presence of head lice within a school can lead to feelings of concern and frustration in parents, teachers, administrators, and staff. Although schools may not be able to eliminate head lice problems, they can be instrumental in detecting and minimizing the spread of infestations within the school and in providing parents with information related to head lice control.

Biology and life cycle. Adult lice are about 2 to 3 millimeters in length. They do not have wings and vary from dirty white to grayish black. They are almost always found on the head of an infested individual. Female lice use an extremely persistent glue to attach their eggs (nits) to hair shafts. Eggs are attached close to the scalp and are usually found on the hair behind the ears and on the neck. In 7 to 10 days, the young lice (nymphs) hatch. They resemble adult lice but are smaller. Nymphs molt (shed their skin) three times before maturing into adult lice in about 10 to 14 days. Both nymphs and adults feed on blood several times each day. Adult head lice normally live 2 to 4 weeks, during which time females may lay 50 to 150 eggs.

Transmission and symptoms of infestation. Head lice are host-specific and only infest humans. They are transmitted primarily through direct contact with an infested individual. Transmission also may occur by direct contact with louse-contaminated combs, brushes, towels, coats, sweaters, hats, or other head coverings. Thus, infestations are commonly encountered in young, school-age children whose activities result in more interpersonal contact.

Medically, head lice are not considered dangerous and are not known to transmit human diseases. They can, however, become a serious nuisance and annoyance due to their feeding activity. The first noticeable symptom of an infestation is intense itching of the scalp. Continued scratching of the infested area



Adult head louse.

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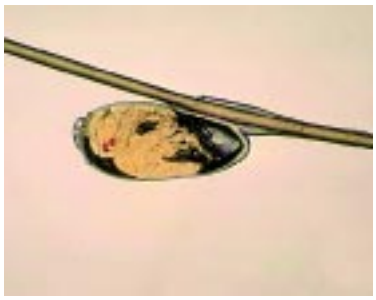
increases site inflammation and may lead to secondary bacterial infection.

Control. The first step in any head louse control program is positive identification of an infestation. All students should be checked for lice during the first 2 weeks of school and rechecked periodically throughout the school year.

Once identified, head lice need to be controlled. Normal hair combing, grooming, or washing does not eliminate an infestation. Control can be accomplished through application of nonprescription insecticide shampoos containing the active ingredients pyrethrin or permethrin. Two treatments are required. The first treatment kills nymphs and adult lice on contact, whereas a second treatment (10 to 14 days later) controls lice emerging from viable eggs. Although there is some concern that lice are becoming resistant to these shampoos, these products remain a recommended practice in the control of head lice infestations. There is also no evidence that one product or active ingredient is superior to others. These products should only be used to help eliminate an existing infestation and should not be used as a routine or preventive shampoo application. Care should be taken to read and follow label directions to ensure safe and proper use.

Handpicking, electrostatic devices, and the use of mayonnaise or heavy vegetable oil to coat the hair have been mentioned as alternative control methods. The effectiveness and reliability of these alternatives, however, have not been adequately demonstrated.



Head louse egg (nit) glued to hair shaft.

After treatment, many empty egg cases or nonviable eggs remain attached to the hair. Although these eggs or egg cases are more noticeable as the hair grows out, they are of little concern. Female lice attach their eggs to the base of the hair shaft, very close to the scalp. Because nymphs normally hatch in about 7 to 10 days and hair grows at the rate of 0.25 to 0.50 inch during this time, any eggs more than this specified distance from the scalp have already hatched or are not going to hatch.

Head lice do not live or reproduce in carpets, furniture, buses, cars, or lockers and die within a day or two if removed from a host. Thus, once an infested individual has been successfully treated the major source of lice has been eliminated. Fumigating or spraying classrooms, lockers, and buses for head lice is not helpful and is not recommended.

Mold Prevention in Schools

by Mark H. Shour, School IPM Coordinator, ISU Extension

One of the potential "pests" encountered in schools is mold, or microscopic fungi that live on plants or animals. Other well-known fungal groups include yeasts, mildews, mushrooms, and "puffballs." The number of different types of mold is uncertain, but estimates often exceed 20,000 species.

Biology of mold. Mold can grow and reproduce almost anywhere if provided with moisture, food, and warmth. Mold spreads and reproduces by making spores, or tiny lightweight structures with a protective "shell." These spores are easily carried on air currents and are capable of surviving for years if conditions are not favorable for growth. When the spores contact a moist food source, they can germinate and grow.

The primary role of mold in nature is to decompose organic (carbon-containing) substances; thus, outdoors these fungi are beneficial because they recycle nutrients. Indoors, however, mold interferes with human activities by causing damage to books, carpeting, clothing, food, furniture, and building materials, as well as causing illness. You may suspect a mold problem in your school even if you cannot see it because of a musty odor often released by the mold as its food source is digested.

Prevention of mold growth. You are routinely exposed to mold spores when you breath and eat, with little or no harm resulting. Some individuals, however, are sensitive to mold and mold by-products. Their allergic responses can vary from flu-like symptoms to more serious conditions. Routine measures to prevent mold growth indoors should be taken to minimize risk to any mold-sensitive students and staff in schools.

Actions that may help prevent mold growth include the following:

- Adjust building humidity to 30 to 50 percent. If possible, maintain this condition year-round (especially during the summer).
- Identify and promptly correct sources of water problems in each structure (water pipe or roof leaks, condensation on duct work, large spills).
- Clean up water damage within 24 to 48 hours to prevent mold growth.
- Thoroughly dry or replace water-damaged items.
- Conduct regular visual inspections of the school facility for mold growth.
- Seasonally check flashing, weather stripping, roof surfaces, and caulking around conduits and plumbing entering the building. Repair any problems promptly.

When you locate areas with mold growth, it is crucial that you take care of the underlying moisture problem and that proper procedures be followed to clean up the problem. Improper use of disinfectants and incorrect choice and use of personal protective equipment can lead to serious health concerns. Cleaning up a mold problem in a structure may require the expertise of an outside contractor.

Information on molds. The U.S. Environmental Protection Agency has issued the handbook *Mold Remediation in Schools and Commercial Buildings* (EPA 402-K-01-001) to help schools with the mold control. This handbook is available online at http://epa.gov/iaq/molds/index.html. Other Web sites of interest on this topic include the following:

Clean up water to prevent mold growth.

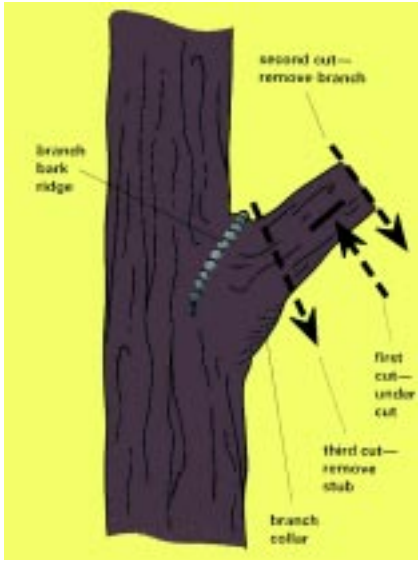
- Wisconsin's School Guide to Dealing with Mold http://schoolipm.tamu.edu/resources/resources/IPM_and_Mold.pdf
- U of MN health and safety mold abatement programs http://www.dehs.umn.edu/iaq/fungus/
- Building Air Quality: *A Guide for Building Owners and Facility Managers* (BAQ Guide) http://www.epa.gov/iaq/largebldgs/baq_page.htm
- Centers for Disease Control, National Center for Environmental Health http://www.cdc.gov/nceh/airpollution/mold/
- The American Industrial Hygiene Association http://www.aiha.org/
- Aerotech Laboratories, Inc. http://www.aerotechlabs.com

Horticultural Tip: Pruning Young Trees

by Chris Feeley, Urban Forester, Iowa State University

Landscape trees need proper care throughout their lives, and pruning is one of the most important tree management practices. Pruning is more than just indiscriminately removing branches or giving some shape to a tree. When done properly, pruning can improve the health, structure, value, and longevity of the tree. This process involves knowing when to prune, which branches to remove, and how to minimize damage to the tree.

The main reason to prune young trees is to develop good branch structure; thus, pruning is most critical in the first 15–20 years of a tree's life. The best time to prune is in mid- to late winter (January–March) because the tree then has a full growing season to seal the wound. For deciduous trees, it also permits the branch structure to be viewed without leaves. Avoid pruning during the spring from bud break through leaf expansion and during the fall (when leaf color changes) because pruning during these times may reduce tree vigor. Untimely pruning also can predispose certain tree species to insect and disease problems. For



Three-step cutting method for proper tree pruning.

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example, oak trees should not be pruned from March 15 through mid-August so as not to be attractive to sap beetles, which transmit the oak wilt pathogen.

Limit pruning activities of newly planted trees to the removal of dead and broken branches. For species with a single leader (one main stem), keep the central leader and remove competing stems. Leave the temporary lower branches on the tree until they reach 1 inch in diameter to facilitate increased trunk growth and root development. Removing smaller branches cause less stress to the tree and wound closure is more rapid.

For established landscape trees, concentrate on removing crossing, rubbing, broken, diseased, and weak-angled branches in the upper portion of the tree and sprouts from the root collar. Eliminate double leaders, if possible, or have a tree company install a metal cable to hold them together (cabling) to prevent branches from splitting during storms.

Before making a pruning cut, identify the branch bark ridge and branch collar. The branch bark ridge is simply where the branch and trunk meet. The branch collar is the swollen area just under the branch. When removing a branch, use the three-cut method (see figure on page 3). Cut 1 is made on the underside of the branch 6–12 inches from the trunk and about one-third of the way through the stem. Cut 2 is made through the stem about 1 inch outside the initial cut, and this removes the weight of the branch to prevent tearing. Cut 3 is made outside the branch collar. Avoid flush cuts (into the branch collar) because the wound will not close properly, if at all.

There is no need to apply paint or wound dressings after pruning because the tree will seal off the area internally. Arborists have found that these treatments trap moisture and microorganisms, which can lead to wood rot.

Using clean, sharpened tools (hand pruner, saw, and lopper) is recommended for two reasons. First, the pruning effort will be easier and the results smoother with sharp tools. Second, you decrease the likelihood of spreading a disease from one tree to another when tools are clean. For best results, clean all cutting surfaces with rubbing alcohol or a 10 percent household bleach solution after pruning each tree.

For more information on pruning, stop by your local ISU Extension office and get a copy of SUL 5, *Pruning Trees and Shrubs*, or call the ISU Extension Distribution Center at (515) 294-5247. A single copy of this publication costs $1.

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