



This is the last printed copy of *Integrated Pest Management for Schools* newsletter. Future issues will be available online at the Iowa State University school IPM Web site: <http://school.ipm.iastate.edu>. If you want to be notified by e-mail when the latest newsletter issue is posted to the site, send your e-mail address to Mark Shour --mshour@iastate.edu.

Exterior Pest: Moles

by Jim Pease, Extension Wildlife Specialist, Iowa State University

The Eastern mole, *Scalopus aquaticus*, is one of Iowa's most common small mammals, yet one of the least seen. It spends the vast majority of its life underground, pursuing its favorite food, earthworms. It's this pursuit that brings it into conflict with homeowners and others with lawns to care for, including school groundskeepers.

Moles are approximately 7 inches long, have a pointed fleshy nose, and are highly adapted for finding prey. They have no external ears and tiny eyes that are only capable of distinguishing light and dark. Their short fur is gray to nearly black, dense, and quite silky to the touch (and was once used for powder puffs and clothing trim!). Their front feet are quite large, powerful, and paddle-like, allowing moles to literally "swim" through the soil and pin unsuspecting worms to the soil so they can eat them. Moles have a very high metabolism: they must consume more than their body weight each day in worms, grubs, centipedes, insect larvae, and spiders. Moles are strictly carnivores and do not eat plant roots.

It is this digging for food that brings them into conflict with lawns. Being primarily a woodland creature, moles often are found in lawns adjacent to woodland areas or in areas with very mature trees.

Some school sites may fit this description. Moles have two types of tunnels: 1) deeper permanent tunnels that may be 2 feet or so below the surface and lead to their nest site; and 2) surface feeding tunnels that are only 1-3 inches below the surface. The feeding tunnels often raise the sod, exposing roots to air and killing the grass. Fortunately, feeding tunnels often are only used once and then abandoned; if they are discovered quickly, they can be pushed back down and the sod likely will survive.



Eastern mole adult. Photo by Howard Whiteman, Murray State University, KY.

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Their food habits make moles difficult to control. Most poisonous baits are grain-based and moles will not eat them readily. None of the purported “remedies” have any basis in fact: chewing gum, vibrations, castor oil, or ultrasonic devices. Contrary to popular advertising, having moles does **not** mean you have grubs. It does mean that you have a healthy lawn with lots of earthworms. Chemical control of earthworms, while possible, is certainly not desirable, particularly on playgrounds. Gassing is only effective when used in the deeper tunnels. What this means, as a result, is that we are left primarily with trapping as a tool.

Moles may be live-trapped using large cans (#10 or 3-lb. coffee cans) and then moved. They also may be kill-trapped with one of several types of traps available (harpoon, choker, scissor jawed,

etc.). The key in all trapping is finding the “active run,” the tunnel leading from the nest area to the feeding area. Often, this is straight and comes from a stump, cement slab, or large rock that the mole is nesting under. Flatten it with your foot to ground level and then check it again in 10-12 hours. If it is re-elevated, you have found the active run and that is where the trap should be set. For more details on these trapping methods, see ISU Extension publication *Managing Iowa Wildlife: Moles* (PM 1302B) at <http://www.extension.iastate.edu/Publications/PM1302B.pdf>.

Trapping should only be used, though, when children are not present and only where the mole tunnels present a true hazard. While moles do change the aesthetics of a lawn, raising one’s tolerance level for them may, in the long run, be best for all.

Hort Tips: Flowering Shrubs

by Cynthia Haynes, Extension Horticulturist, Iowa State University

Forsythia, bridal wreath spirea, lilac, rose, potentilla, hydrangea... flowering shrubs like these are an easy way to brighten the landscape while marking the months of the growing season.

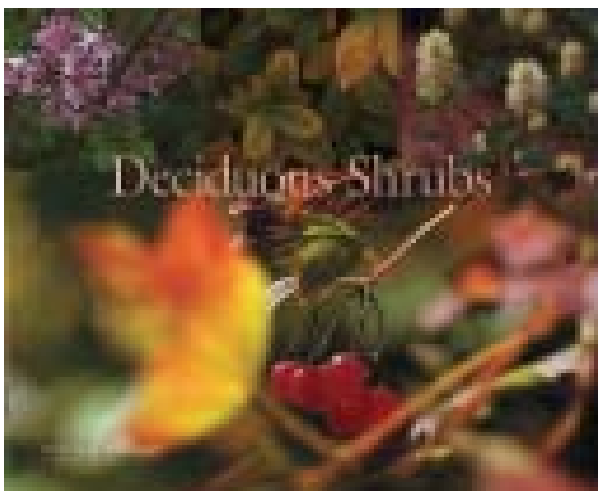
Selecting a Flowering Shrub. There is a flowering shrub to suit almost any situation. Before purchasing a shrub, evaluate the site. Is the site in sun or shade for most of the day? Does the soil drain well or puddle quickly? Is the ultimate size of the shrub suitable for the site? Will it be used for a large hedge or screen? Do the color, form, and texture match the overall landscape design?

Flowering shrubs such as lilac and roses prefer full sun with well-drained soils. Other shrubs such as bridal wreath spirea and hydrangeas prefer part

shade. Virginia sweetspire and summersweet clethra prefer moist soils, while potentilla and beautybush prefer dry soils. The availability and variety of shrubs that will meet these diverse environmental conditions is staggering. For more selections that are appropriate for Iowa, visit a local garden center or purchase a copy of “Deciduous Shrubs” (PM 1943) from your local county extension office or online at www.extension.iastate.edu/pubs.

Maintenance

Flowering shrubs are generally divided into spring bloomers and summer bloomers, a distinction that is important for the timing of pruning. Spring flowering shrubs bloom on growth from the previous year, so pruning immediately after blooming is best. Summer blooming shrubs bloom on new growth. In



Check out this *Deciduous Shrubs* publication from ISU Extension (PM 1943).



Morton Centennial is a large shrub rose that prefers sunny sites.

this case, pruning in winter or early spring before bud break is ideal.

Many flowering shrubs benefit from “renewal pruning” when they become overgrown. As a general rule, renewal pruning is the removal of a third of the largest stems (at ground level) every year for three consecutive years. Since only one third of the stems or canes are removed each year, the shrub continues to

flower well. After the third year of pruning, all of the stems left are probably young and vigorous, hence the name renewal pruning. For more information on pruning shrubs, purchase a copy of “Pruning Ornamental Shrubs” (PM 1958) from your local county extension office or online at www.extension.iastate.edu/pubs.

Interior Pests: Pantry Insects

by Ken Holscher, Extension Entomologist, Iowa State University

A number of different stored product pests occasionally may cause problems within school buildings. These insects initially may have entered the building by accident and then found suitable materials on which to feed and reproduce. More likely, however, these insects already were present in stored products that were brought into the building and then remained unnoticed until populations escalated.

The first step in eliminating an infestation is to identify the type of insect involved. Stored product pests commonly are divided into three groups: weevils, secondary beetles, and moths. While species identification is not critical, determining which of the three groups are involved can be beneficial in locating infested items.

Rice weevils, granary weevils, and maize weevils are similar in appearance and have similar life cycles (see photo). Adults are reddish-brown to black, elongated, hard-shelled beetles that have a characteristic long snout or beak. Adults may vary slightly in size but are typically 2.5 mm in length. Weevils primary are stored product pests because they develop inside whole kernels or seeds that are of sufficient size, such as dried corn or beans. Female weevils chew a tiny hole in the kernel or seed and then deposit a single egg in this opening. The female then



Maize weevil adults. Image courtesy of Winnipeg Cereal Research Centre, AAFC



Red flour beetle adults. Image courtesy of Winnipeg Cereal Research Centre, AAFC.

seals the hole with a gelatinous material. Upon hatching, the weevil larva feeds within the kernel or seed. Following pupation, the new adult chews an emergence hole through the hollowed-out kernel or seed.

Unlike the weevils, secondary beetles, such as the red flour beetle, confused flour beetle, and sawtoothed grain beetle, do not feed and develop in whole grains or seeds. These beetles develop in processed grain or cereal products such as flour, cake mix, cornmeal, crackers, dry pet food, etc. Red flour beetles are difficult to distinguish from confused flour beetles. Adults of both species are shiny, flattened, elongate, reddish-brown beetles that are about 4 mm in length (see photo). The sawtoothed grain beetle closely resembles the flour beetles but is slightly smaller in size. This beetle gets its common name from six sawtoothed projections that occur on each side of its thorax. Both the adults and off-white larvae of these secondary beetles will be found actively feeding on the infested material.

The most common moth that infests stored products is the Indian meal moth. Adult moths have a wing span of about 20 mm and are easily identified by the markings on their forewings, which are reddish-brown with a copper luster on the outer two-thirds but whitish-gray on the inner third (see photo). Indian meal moths will feed on a wide variety of stored products including grain,

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cornmeal, oatmeal, grits, dry cereal, nuts, dried fruits, rice, pasta, bird seed, dry pet food, chocolate, spices, etc. Only the off-white larva will be found feeding on the infested material. These larvae produce silken webbing that they deposit over the surface of the infested material. They often will leave their food supply when they are fully developed and ready to spin their silken cocoon.

Control of stored product pests requires locating and eliminating all infested materials. The location where these insects are observed can be important in determining what type of materials may be infested. If insects are only observed in lunchrooms and cafeterias it probably indicates that the source of the infestation is originating in stored food items used in the lunchroom program. On the other hand, if the problem appears to be localized in an individual classroom it may indicate the presence of infested birdseed or other food for classroom pets, infested seeds or beans used for art projects, snack crackers or other food items in cabinets, in a supply room, or student or teacher desks.

Since more than one product may be infested, all stored products should be examined carefully. Once all infested materials have been discarded, a general vacuuming of the immediate area is recommended. Chemical control will not be effective in eliminating an infestation and is not recommended.



Indian meal moth adult. Image by Jim Kalisch, Department of Entomology, University of Nebraska-Lincoln.

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