



Interior Pests: Silverfish and Firebrats

by Donald R. Lewis, Extension Entomologist, Iowa State University

What wiggles when it runs and lives under the sink? The silverfish! These wingless, flat insects have a narrow, tapered body and they run very swiftly with a wiggling motion that resembles a swimming fish. Another name for the silverfish is bristletail. This name refers to the three long, slender “bristles” at the rear of the body. The name bristletail is also used for another member of the order Thysanura—the firebrat. Both firebrats and silverfish are 1/2 inch in length when fully grown, with two long, slender antennae on the front of the head. Both organisms have the three the pairs of legs characteristic of insects.

Silverfish may be found almost anywhere in schools and other buildings, but they are most commonly found in moist, warm locations (such as around sinks and showers) where they fall in and cannot climb out. They are covered with shiny silver scales that give their body a metallic sheen. Silverfish are most active at night.

Firebrats are similar to silverfish in overall appearance but lack the silvery sheen. The body color is gray or brown, usually with numerous dark markings that give a mottled appearance. Unlike the silverfish that may be found in any part of a building, firebrats prefer areas of high temperature (90°F and above) and high humidity. Therefore, firebrats are more common in attics and around furnaces, ovens, and water heaters.

Silverfish and firebrats are pests primarily because they are an annoyance. Although they may consume or stain foods, fabric, paper, books, or wallpaper, damage to these items is only substantial when large populations are present for a long time.

The key to managing silverfish and firebrats is to eliminate moisture. Sticky traps are of limited benefit for these insects. Management efforts may not be necessary if populations are low and no damage is noticed, or if infestations are limited to small areas. Residual insecticide applications are used only if conditions warrant. Sprays, dusts, or baits should be placed in cracks, crevices, wall voids, and other likely hiding spots.



A silverfish. Photo from Ken Gray Collection, Oregon State University.

In this issue

- **Interior Pests: Silverfish and Firebrats**
 - **Exterior Pests: White Grubs**
 - **Horticultural Tips: Selecting Grasses for Your Athletic Field**
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Exterior Pests: White Grubs

by Mark Shour, Extension Entomologist, Iowa State University

White grubs can cause significant damage in the school landscape, destroying large turfgrass areas in a short time. Athletic fields and high-visibility areas are key sites on school grounds that would be most affected by the presence of these insect pests. Fortunately, their damage is patchy and sporadic, varying greatly from year to year and place to place, even within the borders of a school property.

White grubs are white, C-shaped, soft-bodied larvae that feed below the soil surface, chewing off roots and rhizomes. The two groups of white grubs can be identified by looking at the pattern of short hairs on the inner curve of the posterior end (called the raster): masked chafers have a general pattern of hairs on the raster, whereas May/June beetles have hairs that form two parallel lines.

The adult stage for white grubs is referred to as a beetle. The most common beetle in Iowa is the masked chafer; the adults are tan with a black stripe (“mask”) across the eyes and face and are approximately 5/8 inch in length. Less common are members of the May/June beetle complex; these beetles are slightly larger, vary from tan to dark brown, and lack the black stripe common to masked chafers. Both types of beetles are attracted to lights and may be seen flying near streetlights, building security lights, or lighted windows. However, the number of beetles flying in an area does not predict the severity of turfgrass damage in that area. Masked chafer and May/June beetle adults feed on leaves of various shade trees, rarely causing noticeable defoliation.

Early symptoms of white grub damage include wilting (stressed by the lack of adequate moisture) or irregular tan patches of turfgrass in August. Continued feeding can produce large, irregular dead patches of sod. These turf areas feel spongy to walk on and the sod can be easily pulled back from the soil surface or rolled back like a rug. Large grub populations in a turfgrass area are often signaled by flocks of birds (especially starlings, grackles, and crows) and “plowing activity” of mammals (moles, shrews, raccoons, chipmunks, and skunks) that feed on these insects.

Proper turfgrass maintenance involving irrigation, fertilization, and cutting height is the first line of defense against turf-feeding insects. There are three general strategies for white grub management on school properties.



A white grub.

Preventive. All designated turfgrass areas receive insecticide applications each year before the grubs hatch. In Iowa, these treatments must be completed by August 1. Effective insecticides currently available have halofenozide or imidacloprid as active ingredients. Applications must be watered in for maximum effectiveness.

Integrated pest management. Sample designated turfgrass areas during August to determine whether white grubs are present and to count the number of grubs per sample area. The sampling area can be 1 square foot of sod (cut on three sides and folded back) or a 4-inch-diameter circle removed using a golf course cup cutter. Corrective action can consist of either applications of beneficial nematodes (such as *Heterorhabditis* species or *Steinernema carpocapsae*) or insecticides containing trichlorfon or carbaryl. Special notes for this management strategy are as follows:

- Ten to 15 sites must be sampled for each designated turfgrass area. After the sample is cut and area checked for white grubs, the sod must be repositioned and watered.
- Corrective action is justified if 8–10 masked chafer grubs are present per square foot or one grub per 4-inch core. For May/June grubs, the action levels are three to five grubs per square foot or one grub per 4-inch core.
- Nematode applications require pretreatment with water. Traditional insecticide applications must be followed with irrigation as per label directions.

- Delaying insecticide applications until mid- to late September permits natural enemy populations (ants, spiders, and several types of beetles) to feed on eggs and white grubs.

Damage repair. Except for proper turfgrass maintenance, no biological or insecticide applications

are made to designated turfgrass areas. Any significant areas that die are resodded or reseeded as needed. This approach is not adequate in protecting athletes from injuries due to loose sod. Additionally, complaints by persons visiting school property may increase if this strategy is followed.

Horticultural Tips: Selecting Grasses for Your Athletic Field

by Dave Minner, Extension Turfgrass Specialist, Iowa State University

Selecting the proper grasses for your athletic field is an important first step in making a safer playing surface. Your field is an ever-changing grass system, often with intense traffic. Consider the type of sport the field will be used for to help in selecting the right grasses. For example, the grass system used for a low-traffic sport such as baseball may not stand up to the rigors of football. Also, objectively review the activity you have on a field and set realistic goals for each turfgrass area. One traffic survey and field evaluation strategy can be found at <http://turfgrass.hort.iastate.edu/extension/traffic.pdf>.

In general, there are three types of cool-season grasses that are used for sport fields, Kentucky bluegrass, perennial ryegrass, and turf-type tall fescue. The intended use of the turfgrass area and the level of management it will receive must be considered before selecting the proper grass. Mowing, watering, and fertility are the basic building blocks for turf management. Your expectations should be lowered if you do not have adequate irrigation. Without irrigation, it will be necessary to mow at the maximum mowing height to prevent turf loss during summer heat and drought. Cool-season grasses are mowed between 0.75 and 3.0 inches for most sport field situations. Below are two typical athletic field situations in Iowa and their related grass strategies.

Baseball/softball. Baseball and softball have limited traffic compared with other sports. A mixture of 80 percent Kentucky bluegrass/20 percent perennial ryegrass by weight seeded at 3 lb/1,000 sq ft makes a suitable playing surface when mowed at 1.5 to 2.5 inches. Mowing heights as low as 0.75 inch are possible for baseball infields or when a tighter, higher standard of playing surface is desired. However, this surface expectation requires more attention to irrigation, mowing frequency, and topdressing. High-traffic areas near first and third base are generally repaired by overseeding with perennial ryegrass or sodding with Kentucky bluegrass.

Softball outfields can either use the Kentucky bluegrass/perennial ryegrass mixture mentioned above or use turf-type tall fescue. This turfgrass species is more drought- and heat-tolerant than either Kentucky bluegrass or perennial ryegrass, but turf-type tall fescue should not be thought of as a substitution for having no irrigation system because there is the risk that it will become clumpy should the grass thin during extreme drought. Turf-type tall fescue can be planted alone at 7–10 lb/1,000 sq ft or it can be combined with 5 percent Kentucky bluegrass and seeded at 5–7 lb/1,000 sq ft.

Turf-type tall fescue has a medium rate of establishment and usually fills in and performs better after the first year. The disadvantage with turf-type tall fescue in baseball and softball is that if it loses turf density, it can become clumpy and provide an uneven surface that affects ball roll. Turf-type tall fescue is a bunch grass and will require overseeding if the stand density gets below 90 percent turf cover and bare soil is visible.

Football/soccer. Similar to baseball/softball all three cool-season grasses can be used to initially establish a football or soccer field. If sod is used it will be 100 percent Kentucky bluegrass. Most fields established by seeding use a Kentucky bluegrass/



Fast-establishing grasses (perennial ryegrass or a mixture of ryegrass and tall fescue) need to be overseeded in spring and fall to reestablish turf on high-traffic areas.

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perennial ryegrass mixture. Intense traffic areas should be overseeded with a mixture of 80 percent Kentucky bluegrass/20 percent perennial ryegrass. If this does not provide an effective turfgrass surface, shift to a mixture with 60 percent Kentucky bluegrass/40 percent perennial ryegrass. Overseeding rates for both mixtures can range from 3 to 5 lb/1,000 sq ft. These rates may even be higher than establishment rates on bare ground because managing wear areas of the field is a “game” of catch up. Usually, you do not have time to wait for the normal seeding rate to develop and fill in. Higher seeding rates ensure faster cover and the potential to develop a protective mat of turf cover. Eventually, you may find yourself using 100 percent perennial ryegrass just to keep up with the level of traffic intensity. Perennial ryegrass germinates and establishes the best of the three grasses even as traffic continues on the seedling turf. Thus, it is a very important part of the grass system. Overseeding rates of perennial ryegrass range from 5 to 15 lb/1,000 sq ft, depending on the field condition and your desire to create fast cover.

Turf-type tall fescue has received less use in Iowa mainly because Kentucky bluegrass and perennial ryegrass have performed so well. Sometimes, turf-type

tall fescue may be the better choice. The foliage of turf-type tall fescue actually has better wear tolerance than Kentucky bluegrass and perennial ryegrass. The seedling traffic tolerance is far better than Kentucky bluegrass but less than perennial ryegrass. For nonirrigated soccer fields, there is the chance that turf-type tall fescue could become clumpy. Nonetheless, there are several successful football and soccer fields in Iowa that use turf-type tall fescue. Because turf-type tall fescue is susceptible to winterkill during extremely cold winters it is more successful in the southern Iowa. Situations such as practice fields, where the priority is more on turf cover than on grass appearance, provide a good opportunity to try overseeding with 100 percent turf-type tall fescue or a mixture of 50 percent turf-type tall fescue/50 percent perennial ryegrass. Turf-type tall fescue has good durability to traffic, drought, and heat once established. Overseeding rates of perennial ryegrass range from 5 to 15 lb/1,000 sq ft, depending on the field condition and your desire to create fast cover.

For more information on this subject, read the article entitled, “Kentucky Bluegrass Varieties for Athletic Fields” posted on the Iowa State University school integrated pest management Web site: <http://school.ipm.iastate.edu>.

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