

Insect control in cool-season turf

Understand regional differences and critical periods of pest infestation.

by Whitney Cranshaw, Ph.D.,
Colorado State University

■ Before turfgrass managers can attain optimal control of insects in turfgrass, they must first understand the habits and injury signs of the target pests. This understanding helps to recognize impending problems, pinpoint critical periods during the season for control and develop the best management techniques.

Regional differences—Although pest complexes in cool-season turfgrass are generally shared, there are important regional differences. For example, problems with Japanese beetle, bluegrass billbug and chinch bugs are generally restricted to areas east of the Mississippi river. Problems in Western states include spider mites (e.g. banks grass mite) and Denver billbug. New species continue to be introduced and spread in North America, such as the Asiatic garden beetle, presently a problem in the Northeast.

Know critical periods—Most turfgrass pests are best managed during certain times of the season. Most white grubs are far more susceptible when they are young and feeding near the surface, so controls are best applied shortly after eggs have hatched. Other insects, such as bluegrass billbug and black turfgrass atenioid, are better controlled in the adult stage, so treatments should coincide with peak periods of adult activity.

Sampling is very important for identifying problems with most turfgrass pests.

For example, numbers of chinch bugs present in a lawn can be determined by sinking an open-ended coffee can in the lawn and filling it with water. The chinch bugs float to the top and populations exceeding 15-20 bugs per square foot indicate a potential problem.

Sod webworms and cutworms can be irritated to come to the surface by drench-

ing an area of the lawn with "disclosing" solutions of dilute detergent or the insecticide pyrethrins. Populations of sod webworms exceeding 6-10 per square foot or cutworm numbers less than half of that suggest treatment may be desirable.

Sampling also identifies "hot spots" in lawns. Most turfgrass insects and mites are not uniformly distributed, and occur in concentrated pockets. Outbreaks of greenbug aphids can usually be found developing under trees, while spider mites, such as clover mites and banks grass mite—tend to occur in warm, dry areas such as next to buildings or on slopes that face south. Distribution of white grubs in a lawn is often determined by soil moisture conditions.

Control options—There are several control options for any pest problem. Using as many of these that are appropriate, in a coordinated manner, is a central idea to Integrated Pest Management (IPM).

Cultural practices limit pest problems. Extra watering can help control outbreaks of chinch bugs by spreading the fungus disease *Beauveria*, which controls them naturally. Watering dry areas also reduces buildup of spider mites in lawns.

A normal lawn contains many natural insect controls. Starlings and blackbirds feed on large numbers of cutworms and sod webworms in spring. Ants feed on many turf insects and a wide variety of other predators—such as big-eyed bugs, ground beetles and parasitic wasps—are present.

If intervention is needed to prevent turf damage, the most obvious management choice is to use insecticides. Many insecticides are labeled for use on turfgrass, each with characteristics that can affect their performance. Some insecticides penetrate thatch well, and are more appropriate for controlling insects below ground, such as white grubs.

Others remain in the thatch layer, where they can best control surface and thatch-infesting species.

New control products—Several new insecticides have been registered for turf-



Masked chafers are adults of annual white grubs.

grass insect control. Talstar, Scimitar and Astro are all pyrethroid insecticides, and they are similar to Mavrik and Tempo. They are now registered for control of most surface-feeding insects. In addition, some of these are effective against spider mites. Merit, from a new insecticide class known as chloronicotinyls, appears to have

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The cranberry girdler is a type of sod webworm.

COOL-SEASON INSECT PESTS AND TREATMENT VARIABLES

PEST	DAMAGE	TREATMENT	CONSIDERATIONS
White grubs (also turfgrass ataenius, Japanese beetles, chafers)	Larvae feed on roots of grasses, and cause drought stress and dieback. Infesta- tions of larger species may attract skunks or crows which tear thatch to feed.	Insecticides that pene- trate thatch well are particularly effective. These include Crusade Mainstay, Proxol/Dylox, Turcam, Triumph, Sevin, Merit or diazinon. Insect parasitic nematodes in the genus <i>Heterorhab-</i> <i>ditis</i> .	Grubs of most species are best controlled when young, shortly after hatching. A light watering after applica- tion moves insecticide into rootzone. Black turfgrass ataenius best controlled when peak flights of adults are observed.
Billbugs (also bluegrass billbug, Denver billbug)	Young develop inside crown of plants. Older larvae feed on roots. Damaged areas may die.	Properly timed surface treatments can kill adults prior to egg laying. Dursban, Scimitar, Crusade/Mainstay, Turcam, Oftanol, Merit and diazinon can be effective. Larval control difficult, but Exhibit nematode can provide good larval control.	Monitoring spring activity of bluegrass billbug emerg- ing from overwintering areas is important in properly timing adult treatments.
Sod webworms	Larvae feed at night, emerging from silken tunnels to clip grass. Damaged areas may thin or even be killed.	Most surface-active insecticides are effec- tive, including Orthene, Sevin, Talstar, Tempo, Scimitar, Dylox/Proxol, Turcam. Neem-derived botanicals (Turplex) and insect parasitic nematodes (Exhibit) are alternatives. Endophyte- enhanced grasses can suppress sod webworms.	Peak injury tends to occur in mid-spring and again in mid-summer. Larvae can be brought to surface with deter- gent solution or pyrethrins (Pyrenone).
Mites , including clover mite, winter grain mite	All active stages feed on grass blades. Heavily damaged grass appears dessicated.	Provide extra water to mite "hot spots" in late winter and spring to delay increase of most mites. Miticides include Talstar, Scimitar, Kel- thane, Dursban.	Winter grain mite and clover mite are "cool season" species primarily active in late winter and spring. Spider mites tend to be worse in drier areas, such as around the base of buildings and trees or on south-facing slopes.

Source: Dr. Cranshaw



Banks grass mites disperse from a grass blade.

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excellent potential for control of white grubs and billbugs. Several new formulations of Dursban will also be available in 1995.

Some biological insecticides are also available. Most widely known are the insect parasitic nematodes, particularly

the species *Steinernema carpocapsae*. Sold under the trade name Exhibit, this product can control billbugs, sod webworms and cutworms. Other nematodes (*Heterorhabditis* species) can control white grubs. A botanical insecticide derived from the seeds of the neem tree is Turplex, which may be useful for control

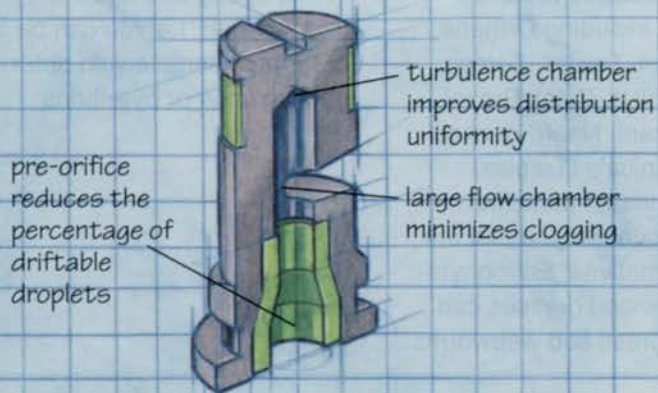
Merit appears to have excellent potential for control of white grubs and billbugs. Several new formulations of Dursban will also be available in 1995.

of sod webworms and billbugs.

Endophytic fungi can be a useful for long-term management.

These are fungi that develop inside certain grasses, notably perennial ryegrass, tall fescue and fine fescue. Endophyte-infected grasses often are more tolerant of stresses such as drought and can resist attack by insects such as billbugs, sod webworms and greenbugs.

—Dr. Cranshaw is an extension entomologist and associate professor at Colorado State University. He recently co-authored "Turfgrass Insects of Colorado and Northern New Mexico."




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Insect control in warm-season turf

Insect control relies on location, identification and determination of numbers.

by R. L. Brandenburg, Ph.D.
North Carolina St. Univ.

■ Certain warm-season turfgrasses species are more commonly attacked by specific insect pests, such as southern chinch bugs on St. Augustinegrass and ground pearls on centipedegrass.

Turfgrass management often relies on insecticides to preserve the desired turf quality. However, many new options are available, and cultural practices can be invaluable for reducing turf insect pests.

Insects damage turfgrass in four ways. They feed:

- by chewing on surface leaves and stems (cutworms, armyworms, sod webworms);
- by sucking juices out of the leaves

and stems, thus discoloring the turf (chinch bugs, two-lined spittlebugs);

- by burrowing into stems (hunting billbugs); and

- underground on grass roots (mole crickets, white grubs).

Understanding a little about an insect's lifecycle and how, where and when it feeds can greatly enhance your ability to manage that pest. Most pests have certain stages when they are most susceptible to control. This is especially important when using many of the new "biological" products.

During the past two years, we have seen a significant increase in new products like entomogenous nematodes that attack insects, neem seed extract that disrupts an insect's development, and new strains of *Bacillus thuringiensis*.

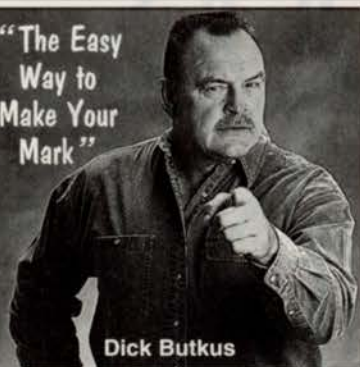


Dead areas in centipedegrass lawn resulting from a severe ground pearl infestation.

We also continue to see changes in product formulation such as the lower odor formulation of Dursban Pro and recent introductions of synthetic pyrethroids such as Astro T&O, Tempo 2, Scimitar WP and Mavrik Aquaflow. New products such as Merit 0.5G offer low mammalian toxicity and are most effective when used preventively for areas of persis-

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CONTROL OF WARM-SEASON INSECT PESTS

INSECT PEST	HOSTS	CONTROL PRACTICES
Southern chinch bugs	all warm-season grasses; prefers St. Augustinegrass	<ul style="list-style-type: none"> ● avoid over-fertilizing ● manage thatch ● irrigate during dry spells ● apply pesticides with plenty of water ● multiple treatments usually necessary
Two-lined spittlebugs	all warm-season grasses	<ul style="list-style-type: none"> ● control adults on ornamentals like hollies ● treat on cloudy days when possible, since spittlebugs are higher up on turf ● begin monitoring in early summer
Cutworms, armyworms	all warm-season grasses	<ul style="list-style-type: none"> ● use "soap flush" to detect ● treat late in day ● do not mow and remove clippings for 1-3 days ● entomogenous nematode products available ● may be present from early spring to late fall
Mole crickets	prefers bahiagrass and close-cut bermudagrass	<ul style="list-style-type: none"> ● use "soap flush" to detect egg hatch ● treat in June/July as soon as eggs hatch ● follow-up treatments usually necessary ● entomogenous nematode products available ● look for adult activity in March/April to define areas of high risk for egg hatch
White grubs	all warm-season grasses	<ul style="list-style-type: none"> ● attracted to low-cut, highly-maintained turf ● dig squares of sod 4-6" deep in late August to detect small grubs ● treatments most effective in late August ● avoid ornamentals attractive to adult stages such as Japanese beetles and June or May beetles
Fire ants	all warm-season grasses	<ul style="list-style-type: none"> ● best controlled in spring and fall when workers are actively foraging for food ● mound treatments generally most effective, but are labor-intensive ● controls must be continued once program is started (fire ants will return at higher levels if treatments are stopped) ● do not disturb mounds during treatment ● use baits prior to contact insecticides to allow workers to return bait to mound
Ground pearls	most commonly attacks bermudagrass and centipede grass	<ul style="list-style-type: none"> ● no known effective control measures ● practice good turf management to increase turf tolerance ● irrigate during dry weather

Source: Dr. Brandenburg

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tent white grub infestations.

Any area suspected of harboring insects must be thoroughly searched to find the suspected pest. The insect must then be properly identified, its relative abundance determined (is it really causing a problem?), and the appropriate control measure applied.

Cultural practices such as thatch management, irrigation, fertility and others work best as strategies that prevent insects from reaching pest status.

Studies in North Carolina show that soil insect pests such as mole crickets and white grubs move deeper into the soil during dry periods, making them more difficult to control. Pre-treatment irrigation can move the insect closer to the soil surface. After insecticide application, a post-treatment irrigation waters in the insecticide and its efficacy is usually improved.

Some of the more common insects attacking warm-season grasses are listed below. Others not discussed here include hunting billbug, bermudagrass mite, bermudagrass scale, sod webworm and rhodesgrass mealybug and southern

chinch bugs.

☐ **Cutworms and armyworms** attack all species of turfgrasses throughout the year, although the fall armyworm is generally a later-season pest. These insects often cause severe damage as they often show up unexpectedly and aren't detected until they have fed for a couple of weeks. Using a soap flush of two tablespoons of liquid dishwashing detergent in two gallons of water will bring these worms to the surface for easy detection.

☐ **Mole crickets** are one of the most troublesome pests in the Southeast. Their aggressive feeding and tunnelling on bermudagrass makes them a serious pest of golf courses, athletic fields and commercial properties. Timing of control measures is critical for effective management.

☐ **White grubs** occur sporadically in warm-season turf. They are difficult to control because they often feed undetected on the roots, and it is more difficult to get pesticides to the target site.

☐ **Green June beetle grubs** tunnel near the soil surface and create unsightly



Severe mold cricket tunnelling in bermudagrass. If left uncontrolled, large bare areas totally void of turfgrass result.

mounds. While they are relatively easy to control, they often cause significant tunnelling damage before their presence is detected. Also, they generally die on the turf surface, leaving an unsightly mess.

☐ **Ground pearls** are a serious pest of centipedegrass. They feed on grass roots, causing the grass to turn yellow and then die. Irregular-shaped areas of dead turf with weeds are a typical symptom. No control measures are known for this pest.

—Dr. Brandenburg is a professor and extension entomologist at North Carolina State University.

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Water-saving tips for the onslaught of hot weather

Here are some tips on saving irrigation water while keeping turfgrass and trees healthy.

Occasional unseasonality has always been one of the curious things about the weather. That includes blistering hot spells when you least expect them.

The University of California Cooperative Extension Service offers these tips for saving on water while caring for turf and trees.

Turf

- Water early in the morning to reduce

evaporation.

- Water lawns separately from trees, shrubs and groundcovers, if possible.
- Remove thatch in spring if it's more than one-half inch thick. Thatch should not be removed in the heat of the summer.
- Control weeds. They compete for water, light and nutrients.
- Fertilize moderately, applying at the low end of recommended rates.
- Keep lawns mowed at the right height: 1.5-3" for tall fescue, 1.5-2.5" for perennial ryegrass and Kentucky bluegrass; 0.5-1" for bermudagrass and zoysiagrass; 0.5-1.5" for St. Augustinegrass.
- Aerate as necessary to prevent soil compaction. Proper aeration requires

removing plugs. Clay soils in particular need regular aeration.

Trees

- Water tree separately from surrounding plants. Trees prefer fewer, deeper waterings than grass.
- Water to a depth of two to three feet to help promote deep rooting.
- Keep turfgrass and other plants at least one foot from tree trunks.
- Apply mulch around trees, keeping it a few inches away from tree trunks.
- Control weeds around trees.
- Avoid soil compaction around trees.
- Do not routinely fertilize landscape trees.
- Prune only when necessary: remove dead and diseased wood, dangerous branches, and suckers growing from the base of the tree.

Listing trees shown to be salt-tolerant

When planning landscape plant installation, several cultural factors should be considered, including the salt tolerance of the plant.

If an area, for instance, is around an oceanside or near a street that may be treated with salt for ice control in the winter, use plants with good salt tolerance. In

other areas, where salt is not a consideration, you can use virtually any plant listed below, and a large variety of others.

If salt tolerance is a concern, you might want to check with your local county extension agent to see what is most readily available and adapted to your particular geographic area.

LOW salt tolerance (0-2000 ppm chloride)	MODERATE salt tolerance (2000-5000 ppm chloride)	GOOD salt tolerance (5000-6000 ppm chloride)
filbert compact boxwood sugar maple red maple lombardy poplar speckled alder sycamore maple larch black alder Italian poplar European beech European hornbeam rose pineapple quava viburnum arctic blue willow spirea multiflora rose winged euonymus barberry little leaf linden black walnut	birch aspen cottonwood hard maple beech white spruce balsam fir Douglas fir blue spruce Texas pivot xylosma pittosporum pyracantha European black currant siberian crab boxelder maple Japanese honeysuckle green ash ponderosa pine golden willow lantana spreading juniper arbor vitae silver buffalo berry	mulberry apricot white oak red oak hawthorne tamarix squaw bush Russian olive Scotch elm white poplar Osier willow honey locust black locust gray poplar silver poplar English oak white acasia bottlebrush oleander common matrimony vine