# 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. Infestations of larger species may attract skunks or crows which tear thatch to feed. | Insecticides that penetrate thatch well are particularly effective. These include Crusade Mainstay, Proxol/Dylox, Turcam, Triumph, Sevin, Merit or diazinon. Insect parasitic nematodes in the genus *Heterorhabditis*. | Grubs of most species are best controlled when young, shortly after hatching. A light watering after application 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 emerging 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 effective, 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 detergent 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, Kelthane, 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.

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

**COOL INSECT** *from page 30*

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 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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MILES

# 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 thruiengensis*.

**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-

continued on page 37

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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 | ● avoid over-fertilizing<br>● manage thatch<br>● irrigate during dry spells<br>● apply pesticides with plenty of water<br>● multiple treatments usually necessary |
| **Two-lined spittlebugs** | all warm-season grasses | ● control adults on ornamentals like hollies<br>● treat on cloudy days when possible, since spittlebugs are higher up on turf<br>● begin monitoring in early summer |
| **Cutworms, armyworms** | all warm-season grasses | ● use "soap flush" to detect<br>● treat late in day<br>● do not mow and remove clippings for 1-3 days<br>● entomogenous nematode products available<br>● may be present from early spring to late fall |
| **Mole crickets** | prefers bahiagrass and close-cut bermudagrass | ● use "soap flush" to detect egg hatch<br>● treat in June/July as soon as eggs hatch<br>● follow-up treatments usually necessary<br>● entomogenous nematode products available<br>● look for adult activity in March/April to define areas of high risk for egg hatch |
| **White grubs** | all warm-season grasses | ● attracted to low-cut, highly-maintained turf<br>● dig squares of sod 4-6" deep in late August to detect small grubs<br>● treatments most effective in late August<br>● avoid ornamentals attractive to adult stages such as Japanese beetles and June or May beetles |
| **Fire ants** | all warm-season grasses | ● best controlled in spring and fall when workers are actively foraging for food<br>● mound treatments generally most effective, but are labor-intensive<br>● controls must be continued once program is started (fire ants will return at higher levels if treatments are stopped)<br>● do not disturb mounds during treatment<br>● use baits prior to contact insecticides to allow workers to return bait to mound |
| **Ground pearls** | most commonly attacks bermudagrass and centipedegrass | ● no known effective control measures<br>● practice good turf management to increase turf tolerance<br>● irrigate during dry weather |

*Source: Dr. Brandenburg*

**WARM INSECT** *from page 34*

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.

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

☞ **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 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.*

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

# JOB TALK

# People, equipment are vital to flood clean-up in Houston

by Ian Burden

■ Five straight days of thunderstorms in October, 1994 dumped 30 inches of rain on 26 counties in southeast Texas. It was the area's worst recorded flood in history, leaving 15 dead, several missing and 8,000 homeless.

The job of draining flood water from 1,700 square miles of densely-populated land fell on the Harris County Flood Control District. The department has a workforce of 250 who sometimes have to fight angry alligators and water snakes to do their job.

The department has more than 150 mowing units, seven large pieces of specialized equipment that can operate in swamp-like conditions, a fleet of trucks, and a variety of chain saws and machetes. It's their job to control vegetation, make repairs and remove flow-restricting debris from natural and man-made water channels.

Considering the fact that both sides of the drainage system must be maintained, the distance grows to a staggering 6,000 miles of drainage channels.

"Our job is to keep the grass maintained on the channel slopes and remove any debris or trash that is obstructing the flow of water," says fleet manager Ray Walters. "On a lot of the drainage channels, we will go in with Alamo 10- and 15-foot hydraulic mowers to mow the grass as close as we can get to the water. Then we use 28-foot Alamo Slopemowers that can reach out and cut the grass and weeds right up to the water's edge.

"In other areas, the only way we can get into the channel to work is by using a flat-bottom boat. In that case, we load our chain saws and machetes into the boat and do the work by hand."

The county has an excellent drainage system. Strategically located flood warning sensors send a message back to the Flood Control Center when water begins to rise. A light will then glow on a special map-board showing the location of the potential flooding.

"But it can't take a 25-inch rainfall like we had without some flooding," notes Walters. "I don't know of many areas in the United States that could."

In spite of the unusually heavy rainfall, only one area in the northern section of the country, near Cypress Creek, flooded. "The creek came up in a hurry," Walters says. "Within only three hours, people had six feet of water in their house."

Houston and Harris County has a drainage system that features very beautiful, park-like sections. The lush growth of various plants and trees provide a backdrop for bike and hiking trails. "Some of our bayous in the city are like park lands," notes Walters. "On the other hand, Buffalo Bayou is a natural waterway that looks like a jungle river with trees hanging over it. There are snakes in that bayou as big as your leg."

The Flood Control District, forever looking for better ways of maintaining the drainage system, is taking a hard look at its chemical spraying operations.

**'It can't take a 25-inch rainfall like we had without some flooding,' notes Walters. 'I don't know of many areas in the United States that could.'**

"We will probably do a lot less spraying this coming year than we have in the past," says Walters. "We are re-evaluating chemicals and how they are applied because we are concerned about the over-kill of vegetation in some areas that causes erosion. We have people working on a new Turf Establishment Program that is working out pretty good for us. We are planting new seedlings and grasses that are natural to our area. Of course, we will have to maintain it with mowers after it gets a good growth."

*—The author is vice president of marketing for Alamo, Seguin, Texas, manufacturers of McConnel, Mott, Terrain King and Triumph outdoor power equipment.*


**A 15-foot mower clears vegetation along flood control drainage canals.** *Photo courtesy Alamo*

# Landscape managers digging into new growing medium

by James E. Guyette

■ Landscape managers in Texas are digging into a new highly efficient planting medium that is cheaper than peat moss. "It's never been done before, but it's an excellent product and it's very economical," reports Gary Kinney of Kinney Bonded Warehouse, a horticultural supply firm in Donna, Texas.

"The local landscape trade here is using it and I've sold all of our crop potential so far," says Kinney. The material comes from kenaf, a tall, leafy, fibrous plant closely related to the hibiscus. Until now kenaf (pronounced "kuh-NAFF") has been used mainly for cattle feed, rope and newsprint.

It holds high hopes for the landscape industry, according to Kinney and Dr. Yin Tung Wang, a horticultural scientist at the Texas Agricultural Experiment Station in Westlaco.

Previously the core of the kenaf plant was usually discarded, "but we researched it as a potting medium and it worked," says Kinney.

"The whole idea," Wang explains, "was to reduce production costs by using kenaf in the potting medium instead of peat moss, which is expensive and must be shipped in from Canada.

"But our research showed that to keep the desired properties of the mix, we still had to blend in some peat moss. So the challenge was to determine the maximum proportion of kenaf, while at the same time providing a healthy growing medium for plants."

After almost three years of research, that proper proportion turned out to be an approximate mixture of 70 percent kenaf and 30 percent peat moss.

"There are a few other minor ingredients in there such as wetting agents and time-released fertilizers, but that 70/30 mixture works quite well and keeps cost low," according to Wang. The bulk kenaf product sells for $14.50 per cubic yard; peat moss is $21 to $25 per cubic yard.

**The kenaf processing plant is able to reproduce any type mix that anybody in the landscaping business might ever want to order.**

Harvesting of the first-ever landscape-oriented kenaf crop began last fall on a 750-acre spread. It soon sold out and more is being planted.

This year's kenaf harvest will produce some 20,000 to 22,000 cubic yards of material for use as a planting medium, but Kinney anticipates needing more than 100,000 cubic yards at full production to meet the demand.

It is being processed at the new Kenaf International Plant north of Weslaco, and Kinney plans to construct a building adjacent to Kenaf International this spring to house a $150,000 mixing facility. "With that mixing equipment, we'll be able to reproduce any type mix anybody in the (landscaping) business would want," Kinney says.

Kenaf originated in Africa and was brought to the Rio Grande Valley in the 1920s and '30s. In a few months, kenaf grows from a small seed to a 15-foot-tall plant. If harvested early, the leaves can be used as cattle feed. But in the Rio Grande Valley, the kenaf industry uses kenaf stems—not leaves—so the plant is allowed to grow to maturity. The kenaf bark, known as bast, is high in fiber. It is stripped, compressed, baled and sent to a paper mill in North Carolina, where is used to make high-quality newsprint. Once the bark is stripped and shipped, the stem core is then ground into fine particles that are mixed with peat moss and other materials to form the growing medium.

Kenaf byproducts are also used for wallboard and the dashboards of automobiles, and research is being conducted on the material for large-scale vegetable production. Currently landscape contractors and nursery applications are the biggest agricultural users.

"The future looks very bright," says Kinney. "If you look at it it takes some imagination, but as a growing medium it's working quite well."

For more information:

- K-Mix, 102 N. 13th St., Donna, Texas 78537; (210) 464-4491
- Kenaf International, 120 E. Jay Ave., McAllen, Texas 78504; (210) 687-2619
- Weslaco Texas A&M Ag. Experiment Station, Dr. Yin Tung Wang, Dept. of Hort., 2415 E. Highway 83, Weslaco, Texas 78596; (210) 968-5585

*—The author is a contributing editor to Landscape Management. His freelance writing business is based in South Euclid, Ohio.*