

WARM-SEASON INSECT CONTROL

The dry summer and mild winter means that southern turf managers can expect a fierce battle on their hands this year.

by Patricia Cobb, Ph.D., Auburn University

Insect control programs are an important part of the total system of growing grass for most southern turf managers. Drought, high temperatures and insect damage are three factors that have greatly influenced warm-season turf management the last three years.

Although we can only talk about the weather, insect control strategies must be reconsidered and updated annually. In the Southeast, "the big three"—mole crickets, grubs and fire ants—continue to require the most intensive and expensive control efforts.



Control of soil insects such as grubs, mole crickets and fire ants is often complicated by fall drought conditions.

Mole crickets

Mole crickets—now the South's most damaging turf insects—caused severe turf losses in 1988 as far west as Louisiana, and northward along the eastern coast of the Carolinas.

Mole crickets are annual pests in Florida, southern Georgia and the southern half of the mid-Gulf states. Most turf managers believe the drought conditions that existed during spring mole cricket flights resulted in higher infestations on irrigated turf. In addition, control strategies were complicated by the fact that mole crickets were two weeks late in hatching this past season.

Mole cricket control costs often range from \$7,000 to \$15,000 or more annually on golf courses. Monitoring populations in order to time controls properly is essential, and can reduce costs substantially. The loss of

organochlorine residuals in the soil and an increase in irrigated, higher quality turf are often cited as reasons for the increase in grub problems each year.

While grub damage in warm-season turf has been more widespread, the severity of problems reported in most areas generally decreased during 1988. Dan Potter, Ph.D., at the University of Kentucky, reports that drought conditions in soil adversely affect grub hatching and development. (Perhaps there is one drought advantage, after all!)

Fire ants

Fire ants are a major "people problem" in the South.

Pat Cobb, Ph.D., has been at Auburn University for 12 years. She is a professor, extension entomology, Department of Entomology.

Fire ant mounds are unsightly and make mowing difficult. But painful stings are the real problem. Several million dollars are spent in Alabama alone each year for fire ant control.

A hybrid form, found in northern Georgia, Alabama and Mississippi is reportedly more cold-tolerant than either of the two introduced parent fire ant forms. "Multi-queen" fire ant colonies are becoming common in many areas. Control strategies are complicated by drought conditions that drive fire ants down deeper into the soil.

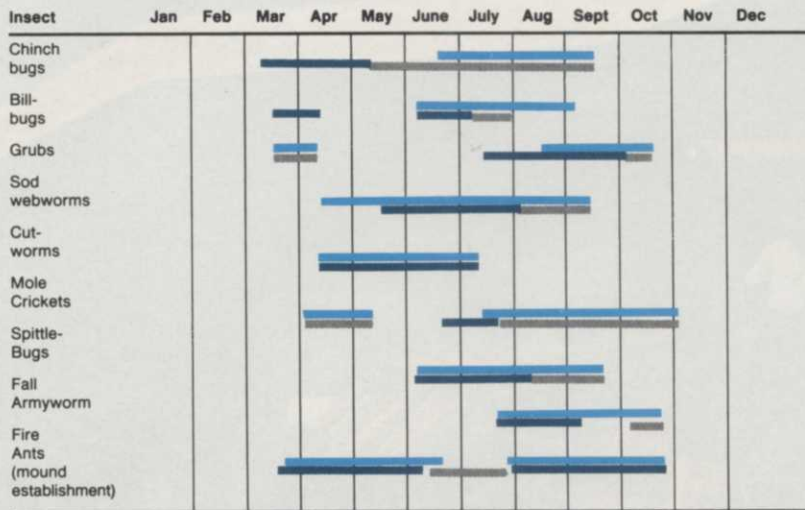
Effective insect control programs are based on knowledge of pests, and of effective control options. While efforts continue in the development of biological controls, for most southern pests our options are properly timed and correctly applied insecticides.

This season, turf insecticides are still few in number. Some are currently under EPA review. A few are restricted to very precisely defined sites for use by permit only. New formulations of older products (Sevimol, a carbaryl formulation; Mocap 5G, an ethoprop formulation) have been introduced. Continued regulations of pesticide use will make wise and timely use essential.

High pressure liquid injection (up to 2000 psi) and gravity-flow, low volume granular applicators are parts of the new technology available for making more effective use of what we have available.

continued on page 40

*MONTHS DURING WHICH DAMAGE IS MOST LIKELY TO OCCUR (——);
MONTHS WHEN INSECTICIDE TREATMENTS MAY BE RECOMMENDED
(—— = 1ST CHOICE, —— = 2ND CHOICE)



*Timing of treatments varies from one area to another, and is considerably different in South Florida. Check with Extension Agents in your area and monitor pest populations to determine exact timing of controls.

Biological control products are, for the most part, still in the future. However, insect-infecting nematodes are for the first time being marketed for such lawn pests as grubs.

Research with "bio-engineered" insect bacterium-bearing endophytes (plants within plants) holds promise for making some warm-season grasses exempt from insect damage.

Back to basics

Adverse weather conditions that complicate and increase costs of strategies often remind us of the need to get "back to basics." There is no substitute for proper timing of cultural and insecticidal control efforts. Healthy grass sustains and recovers from damage quicker.

Monitoring pest populations and directing insecticidal controls at the vulnerable pest stage is more cost effective than "hit-and-miss" preventive treatments. The information contained herein is intended to assist the Southern turf manager with development of control strategies for common insect pests.

Late winter

Billbug and chinch bug adults may become active during warm days of late March in some years. Treatment if adults are numerous and active may prevent population build-up and turf damage later in the season.

Zoysia and Bermudagrasses are preferred by the hunting billbug. St.

Augustinegrasses (except Floratam in most extreme southern areas) and occasionally Bermudagrasses are infested by chinch bugs.

Early season treatments should be done during midday when billbug and chinch bug adults are most active. Re-infestation later in the season may occur from infested, untreated adjacent turf areas.

Grubs become active in more southerly areas in late March. Evidence of "varmint" digging—armadillos, skunks, raccoons—may indicate movement of grubs into the root zone of the turf.

Generally, treatment at this time is "second best" behind middle to late summer applications for smaller grubs. However, late March treatments may be necessary in areas where grubs are detected for the first time, especially in cool-season grasses in order to reduce damage before the turf enters summer dormancy.

Warm-season grasses, in many instances, will recover from early season grub damage. In the south, the period between spring grub activity and pupation is short. (The pupa is the stage from which the beetle emerges that is not affected by insecticides). Therefore, if spring treatment is done it is most effective during late March or early April.

Areas receiving spring grub treatment should be checked in middle to late summer for small grubs since re-infestation may occur. Mole crickets

are the most damaging turf insect pests in the southeastern U.S. Timing of controls may vary from one area to another. Therefore, monitoring populations is critical since proper timing is often as important as insecticide choice.

In southern Florida mole crickets are active year around. Mole crickets may be active during winter months anytime a few consecutive days of warm weather occur. In mild winters—such as the last three—tunneling damage may continue periodically from November into late winter months. However, tunneling usually increases dramatically during late March in most areas.

Mole crickets begin mating flights in late March, so in most areas March treatment is not recommended. Turf should be maintained properly throughout this time however, in order to minimize tunneling damage.

Spring (April-May)

Chinch bug and billbug adults become more active during the warmer days of spring. Generally, egg laying occurs in April on warm-season turf. April treatments may prevent population build-up by eliminating egg-layers and, therefore, reduce damage later in the season.

Chinch bug treatments in May reduce the first nymphal (immature) population. Grubs that have not pupated can be controlled during early April. Infested areas that don't "green up" should be checked to verify the presence and stage of development of grubs.

Irrigation or rainfall should follow grub applications. In some areas of the South, Japanese beetle grubs are a problem on lawns. Spring is a good time to make applications of milky spore disease products for these grubs. However, other grub species are not controlled by these products.

Mole crickets remain active during April and early May. Spring treatments may be needed in severely damaged areas if overwintered crickets are present. To determine cricket presence, pour soapy water (2 tbs. liquid dishwashing soap in 1 gal. water) on turf areas where infestation is suspected. Crickets will usually surface in three to 15 minutes (longer in cool weather).

Irrigate soap-flushed areas afterwards to avoid sun-scald damage to the grass. Egg laying takes place during April and May. Nymphs usually hatch in central Florida during April and May. Farther north, hatching begins in late May or early June. Sod webworm larvae that have overwintered in the turf begin feeding when



Overwintered spittlebug eggs hatch in the spring. Noticeable damage usually appears in June and July and may continue during the summer and fall.

the grass greens up in spring. These larvae soon pupate, and moth flights are common in April. Larvae usually hatch about two weeks after the moth flight peaks.

Sod webworm damage to the turf may resemble disease injury. Areas frequented by birds (such as starlings) can be flushed with soapy water to verify the presence of sod webworms.

Cutworm moths begin egg laying in the spring. The larvae hatch, and feed at night on grass blades. Damage is most often a problem on golf greens. Moths prefer to lay eggs in aeration holes, so larval feeding may be mostly associated with the turf around these holes.

Feeding damage is usually a spring problem (April-May), but some years is observed throughout the summer. Insecticides for cutworm control should be applied late in the afternoon so that contact will be made with the night-feeding larvae. Little, if any, irrigation after treatment is advised, unless specified by the product label.

Fire ants continue to be a "people problem" throughout the South. These ants inflict painful stings to man and animals. Quarantine and regulatory measures require treatment and inspecting sod and nursery stock that is shipped out of the fire ant zone.

Fire ants begin to establish new mounds during warm, wet spring days. During this time these ants are near the soil surface and workers are actively foraging for food. Fire ant baits often work well during this time, and broadcast treatments may eliminate new mounds that are not yet visible above the turf surface.

Old, established colonies can be

mound-treated with a contact insecticide about two weeks after baits are broadcast. Most baits work slowly. Delaying treatment of established mounds gives the ants a chance to find the bait and feed it to the queen(s), but eliminates workers that might otherwise be present for several weeks.

Summer (June-August)

Chinch bug damage usually first appears during dry periods of June. Damage may continue into fall since there are several overlapping generations. St. Augustinegrass varieties (except Floratam in most extreme southern areas) are most commonly attacked, but as in the past dry summers, Bermudagrasses may occasionally be damaged.

Treatments may have to be repeated if re-infestation from untreated borders or lawns occurs. Billbug grubs can be found in the soil by middle to late June. Check areas of turf, especially zoysias and Bermudagrasses, where adult billbugs were observed in the spring.

Persistent drought stress symptoms on irrigated turf, or "thin" sod may indicate a billbug problem. Treatments should be applied like other grub treatments: watered immediately after application.

Grub problems are becoming more widespread in southern turf. Late summer treatments are usually the most effective for controlling grubs.

Beetle flights most often peak sometime in June, and "new generation" grubs are usually present by middle to late August. However, during drought years such as the last three seasons, grub emergence patterns, egg laying and survival may be

affected.

Check turf where spring grub activity occurred, or where bird feeding is observed, before treatment is done. If the weather is hot and dry, irrigate the day before treatment to move grubs into the root zone. Remember to also irrigate after treatment.

Green June beetle grubs may move over the turf surface (on their backs with legs up). These are large grubs that cause mostly mechanical injury. Because of their mobility they can move from untreated, unmanaged areas onto turf.

Mole crickets hatch during late spring and early summer. By late June and early July, newly-hatched nymphs of both species are present. In most areas of the South, mole crickets hatched almost two weeks late in 1988.

Because of the voracious feeding by the tawny mole cricket (and the short-winged mole cricket in south Florida), there is the potential for sudden, serious turf loss as nymphs increase in size during July and August. Timing of controls for mole crickets varies with location.

Monitoring hatching and weekly presence of newly hatched nymphs by soap flushing is suggested as an aid to developing a seasonal control program.

Residual controls, such as Mocap 5G and Oftanol, are most effective on younger nymphs. Treatments should be watered immediately. Triumph 4EC has provided several weeks residual control. Current registrations within southern states (Special Local Needs, 24(c), registrations) specify sites for Triumph's expanded use. Less residual mole cricket treatments include bait applications and/or sprays with Orthene 75S. Baits are most effective in the mid-Gulf states from July through September. Orthene sprays seem to be more effective on two- to three-week-old nymphs than on newly-hatched mole crickets. Orthene sprays and/or bait treatments should be applied late in the day to turf irrigated several hours earlier, and not irrigated (or as label specifies) after treatment.

Sod webworms damage warm-season turf most severely from late June through August. Insecticide applications should be made when larvae are present or a week or two after peak moth flights from infested turf. Twolined spittlebugs are primarily lawn pests. However, other turf areas have been damaged in recent years. Since spittlebugs are highly dependent upon moisture for survival any area with thick turf, thatch accumulation and high humidity is susceptible to

USE SUMMARY OF SOME COMMON TURF INSECTICIDES*

| Common Name | Trade Name | Major Uses | Primary Use Site *** | Common Name | Trade Name | Major Uses | Primary Use Site *** |
|--------------|---------------------|---|----------------------|-------------|---------------|--|---------------------------|
| acephate | Orthene 75S | fire ants mole crickets | A, G, L, S | diazinon | Diazinon | billbugs chinch bugs fall armyworms fire ants grubs sod webworms spittlebugs | L |
| **bendiocarb | Turcam | grubs mole crickets | A, L | **ethoprop | Mocap 5G | grubs mole crickets | A, G, L, S |
| carbaryl | Sevin SL Sevimol | billbug (adults) cutworms fall armyworms green June beetle grubs grubs sod webworms | A, G, L, S | isofenphos | Oftanol | fire ants grubs mole crickets | A, G, L, S |
| chlorpyrifos | Dursban | billbug (adults) chinch bugs cutworms fall armyworms fire ants sod webworms spittlebugs | A, G, L, S | **isazofos | Triumph | chinch bugs mole crickets grubs | L (G&S in some states) |
| | | | | trichlorfon | Dylox, Proxol | cutworms fall armyworms grubs sod webworms | A, G, L, S |

*Fire ant baits (Affirm, Amdro, Logic, Pro-Drone) are not included above, but may be used in non-crop areas) ***A=athletic turf L=lawns
**Restricted Use G=golf courses S=sod farms

damage.

Adult spittlebugs are pests of ornamentals, but the piercing-sucking feeding of nymphs (immatures) damages turf. Adults are especially attracted to Japanese hollies, and move from these shrubs to surrounding turf.

Overwintered eggs, laid in the turf, hatch in the spring. Noticeable damage usually appears in June and July and may continue during the summer and fall due to at least two overlapping generations.

A variety of warm-season grasses may be infested. Damage first appears as yellow spots, then these areas spread and eventually die. Masses of "spittle" enclosing nymphs located deep within the turf may give the turf a "squishy" feeling when walked on. Infested areas should be mowed (remove clippings) and watered before treatment. Thatch management and prevention of excessive watering may disrupt the humid environment necessary for spittlebug survival.

Spittlebugs are usually not a widespread problem during drought years except on thick turf with irrigation.

Fall armyworm moths arrive in the spring from southerly areas such as Central and South America. Along the Gulf Coast, fall armyworm damage to turf is usually reported by late June. Bermudagrasses that are highly maintained are preferred. Although several generations may occur each year, damage to turf is usually not permanent unless disease, drought or other stress follows.

Damage to turf from fall armyworm feeding during summer can be "repaired" by proper fertilization and watering. Although fall armyworms may feed in large numbers anytime during the day, they are often most active in early morning and late afternoon. Treatments are most effective at these times.

Ground pearls are scale insects that live up to 10 inches deep in the soil. They are found in areas along the Gulf Coast, sandy soils of the central Gulf states, southern east coast areas and parts of the Midwest.

These pests damage turf most severely during summer when other factors such as heat stress, disease and drought weaken the grass. Centipede grass is especially susceptible to damage when over-fertilized. Eggs hatch within the soil in the spring, and nymphs feed throughout the summer by piercing root tissue and extracting plant fluid.

Chemical control of ground pearls has not been effective. Rather, proper fertilization, disease control and adequate irrigation have been effective in controlling damage.

Fall (Sept.-Oct.)

Fall may be the most difficult time of the season to control southern turf insect pests. Attacks on turf by surface feeders, such as fall armyworms and sod webworms, may result in damage that is difficult to repair on warm-season grasses before winter dormancy. Thatch-dwellers such as chinch bugs

and spittlebugs can be controlled during fall; but again, stress to the turf may be greater entering dormancy because of damage by uncontrolled populations.

Control of soil insects such as grubs, mole crickets and fire ants is often complicated by fall drought conditions. Irrigating turf before treatment as well as after treatment may be necessary to realize effective control of these pests.

Grubs and mole crickets are more effectively controlled at smaller, more immature stages earlier in the season. Grub treatments are usually most effective during August and September. Treatments become less effective as the soil temperature decreases and grubs move deeper into the soil to overwinter.

Mole crickets fly again in the fall, and damage is more severe as turf growth slows. As the temperature decreases, insecticides work more slowly. Fall mole cricket treatments of Orthene 75S are more effective in August and September than in October. As for residual treatments, Triumph 4E has provided effective fall mole cricket control (for use by professional lawn care only; or restricted in designated areas).

Fire ants that have become established during the season are difficult to control during hot, dry fall periods. Once rain begins, new mounds are established and area broadcast treatments, as well as mound treatments, may be necessary in heavily-infested areas. **LM**