

WARM SEASON INSECT CONTROL

Warm southern temperatures and shifty weather patterns make insect control especially tricky. Pest problems vary in intensity from year to year.

by Patricia P. Cobb, Ph.D., Auburn University

Managing turfgrasses in the south is a great challenge. The wide variety of grasses now grown in the South brings into focus the diversity of associated pest problems.

The increase in insect problems, coupled with increased environmental concerns and costs of control strategies have caused southern turf managers to take a new look at all aspects of insect control.

Importance of cultural control

Total management schemes are nothing new. However, an awareness of how all aspects of growing and maintaining healthy turfgrass influence pest control strategies continues to increase. Insect control on turf in the South is a year round job. Although actual control efforts can extend from March through November in some areas, most southern turf managers consider insect control to be a part of a total management scheme for growing grass, one that goes on all year.

Each year brings with it a unique set of conditions that contribute to the development of turf pest problems.

Weather patterns this past season provided conditions which favored development of various pests. Abundant spring rains in the Southeast contributed to optimum requirements for two-lined spittlebug survival at this time. Damage on lawns in many areas was first reported in May rather than mid-June. Later, extreme drought conditions in these same areas discouraged spittlebug survival, but favored the buildup of fall armyworms and chinch bugs.

Fire ants establish colonies most frequently after spring and fall rains, and were numerous again last season during these times. During drier months last year, fire ants were sometimes found in equipment and structures. Fire ants infest the Southeast, but potentially can spread to areas along the Pacific coast.

Return of the webworm










The "usual" turf pests—grubs, mole

crickets and fire ants—continue to be the "big three" in the Southeast. However, this past season was the second year tropical sod webworms were reported to be damaging turf in areas along the Gulf Coast westward into Louisiana.

These pests are typically found in central and south Florida and are resistant to most insecticides. They were controlled with formulations of *Bacillus thuringiensis* varieties such as Javelin WG.

Biological control agents continue to hold promise for controlling some pests. Insect-attacking nematodes and parasitic red-eyed flies have been released in Florida to help in the battle against mole crickets. Prior nematode releases resulted in mole cricket suppression in test areas to the degree that mole crickets at those research sites were not a damaging problem. In addition, tests with parasitic nematodes for control of surface feeding caterpillars are under way. Also in Florida, a fungus—if application tech-

The TOP 10 Warm Season Insect Targets

Pest	Spring March-May	Summer June-August	Fall-early winter Sept.-Dec.
1 Mole crickets 	Map areas of overwintered mole cricket activity for treatment of nymphs in May-July. Treatment of overwintered populations is optional in most areas, and does not replace treatment of nymphs. Tunneling can be reduced with Orthene sprays (3.5 lb. ai/acre). Keep grass roots in contact with the soil, fertilize, and water grass as recommended. Monitor areas mapped weekly with soap flushes to determine when hatching begins. If hatching occurs before June treat as recommended for summer.	Apply one of the following within six weeks after first observed hatch: Mocap (7.5-10 lb. ai/acre), Oftanol in areas where used no more than two years (2 lb. ai/acre), Triumph ² (2 lb. ai/acre/season), Turcam (2 lb. ai/acre) or Sevimol (6-8 lb. ai/acre). Spot or area treat later in the summer with Orthene (2-6-3.5 lb. ai/acre) or Dursban bait (75-150 lb./acre).	Spot treat with Orthene of Dursban bait or Triumph (if not used earlier) as recommended for summer.
2 Grubs 	Map areas of spring damage and monitor later in summer for reinfestation control during late March-early April is "second-best" and does not extend to new generation grubs in late July-August.	Map grub infestations and treat these areas. Late July-August treatments may include Turcam (2-4 lb. ai/acre), diazinon ³ (4 lb. ai/acre), Triumph ² (2 lb. ai/acre) or Mocap ¹ (5 lb. ai/acre). Irrigate before treatment in hot, dry conditions.	Treatments are effective most years through Sept. Proxol (8 lb. ai/acre) or Triumph ² (2 lb. ai/acre) are effective for late-season control. For green June beetle ⁴ registered formulations of carbaryl (Sevin, 2 lb. ai/acre) are effective.
3 Fire ants	Area treat April through May infested turf of an acre or more with a broadcast application of a fire ant bait: Amdro (1.5 lb. bait/acre); Affirm (1 lb. bait/acre); Logic (1-1.5 lb. bait/acre). Wait a week, mound treat visible mounds with a registered formulation of a contact insecticide such as diazinon ³ , Dursban or Orthene.	Treat mounds as reinfestation occurs as recommended for spring. 	Area and mound treat as described for spring in heavily-infested areas. Apply controls when worker ants are actively foraging. Irrigate before treatment if drought conditions exist.
4 Chinch bugs (Southern)	Replace susceptible turf with resistant or non-host varieties. Treat overwintered adults when they become active in March or nymphs in April-May with diazinon ³ (4 lb. ai/acre); Dursban (1 lb. ai/acre); Triumph (1 lb. ai/acre), Tempo 2 ⁴ (.14 lb. ai/acre); or Oftanol (2 lb. ai/acre). Control thatch as recommended.	March-May treatments usually prevent summer damage. Wet springs may delay population buildup, and therefore treatment. Treatments delayed till summer are as recommended for spring. Damage limited to sunny areas.	Spring or summer treatments usually make late season applications unnecessary. 
5 Two-lined spittlebugs 	Monitor turf and landscape areas for nymphs. Infested turf is "squishy" when walked on. Some years nymphs are present in spittle masses in May. Control thatch as recommended.	Mow, irrigate several hours or the day before treatment. Diazinon ³ (4 lb. ai/acre); or Dursban in less thatchy turf (1 lb. ai/acre) are effective controls. Damage resembles chinch bug damage, but usually first appears in shady areas.	Treat reinfested areas in early September as recommended for summer. Further fall treatment is not required.
6 Sod webworms	Common sod webworms emerge as adults in most areas in April. Time treatments of infested turf two weeks after peak moth flight. Turf moderately damaged will usually grow out, and treatment can be delayed until the summer generation (S). Diazinon ³ (4 lb. ai/acre); Dursban (1 lb. ai/acre); Proxol (6 lb. ai/acre); Orthene (1/3 lb. ai/acre); Tempo 2 ⁴ (.09 lb. ai/acre); or b.t. formulations may be used when larvae are present.	Treat when larvae are present or as described for spring. Tropical sod webworms should be controlled as young larvae with b.t. formulations such as Javelin WG. 	Treatment in early September in more southerly areas may reduce overwintering populations.
7 Cutworms 	Treatment is not usually necessary until late March or April. Apply insecticide late afternoon and irrigate as label requires. Treatments include Dursban (1 lb. ai/acre); Proxol (6-8 lb. ai/acre); and Sevin (2-4 lb. ai/acre).	In the South, cutworms are usually a spring (and sometimes fall) problem. If summer infestations occur, treat as recommended for spring.	Treat as recommended for spring.
8 Billbugs 	Treatment of adults can be done when they become active. These include diazinon ³ (4 lb. ai/acre), Dursban (1 lb. ai/acre), Oftanol (2 lb. ai/acre), or Triumph ² (1 lb ai/acre).	Treat billbug grubs with grub rates of Turcam or Triumph (if not used earlier), or diazinon ³ .	Billbug infestations discovered now are more difficult to control.
9 Fall armyworms 	Treatment not needed at this time.	Populations usually develop during July-September. Treatments are most effective in early morning or late afternoon. Use Dursban (1 lb. ai/acre); diazinon ³ (4 lb. ai/acre); Proxol (6-8 lb. ai/acre); or Tempo 2 ⁴ (.09 lb. ai/acre).	Apply as directed for summer. Fall armyworms are usually a greater problem in September.
10 Ground pearls	Fertilize, dethatch, lime, etc. as recommended. No insecticide has been found to be effective.	Avoid drought stress, disease and other pressure. No insecticide has been found to be effective.	Avoid drought or other stress.

¹ Golf courses and sod farms. ² See soil restrictions; use only 2 lb ai/acre/season. ³ Not for use on golf courses or sod farms. ⁴ Home lawns only.



The two-lined spittlebug may become established deep within the turf during May.

niques can be developed—may be useful in combating fire ants.

Biological reminders

What has been learned from the use of "milky spore" for Japanese beetle and nematodes for mole cricket control can serve as reminders:

1. **Susceptible pests** must be present in great enough numbers for biological control agents to become established.

2. **Environmental requirements** (moisture, temperature, etc.) for establishment of pathogens must be met.

3. **Control may be slow** and result in suppression rather than elimination of the pests. Suppression is a more long term solution, however, if situations such as pest resistance are to be avoided.

New insecticides

Insecticides are important components of southern turf pest management strategies. A few additions provide new choices for turf managers. Crusade 5G (fonofos) will be marketed on a limited basis this year for soil insect control. Mocap 5G has been discontinued and a new formulation (different granule) of Mocap 10G will be available for golf

courses and sod farms. Orthene Turf, Tree and Ornamental Spray has a label expansion which includes chinch bugs. Tempo 2 has effectively controlled surface feeders on home lawns.

New delivery systems

New methods for delivering insecticides more precisely to pests are of particular interest. New technology continues to focus on subsurface insecticides for grub and mole cricket control.

"Precision placement," as termed by one turf scientist, includes high pressure injection of liquids, and more recently subsurface application of granular formulations. Both systems have the advantage of placing insecticides directly into the zone of pest activity. There is less surface residue, therefore less ULV breakdown. Drift is essentially eliminated, and reduced rates of effective insecticides provide control equivalent to full rates of these same compounds surface-applied.

There are still questions to be answered about both systems: Which insecticides are most effective? What are critical soil moisture and irriga-

tion levels? How do these techniques affect the "window" for optimum application timing?

The potential for environmental and personal safety with such systems are major reasons why this concept will continue to be an active area of application technology research.

Locale and turf considerations

What your most important turf insect pest is depends on where you are located and what grasses you manage. Mole crickets are considered primary pests in Florida, south Georgia and other southeastern areas. Grubs and fire ants are of great importance in Texas; chinch bugs in Louisiana; grubs in California.

In addition, how and when you control insect pests will also vary regionally. Do not expect insecticidal, biological or cultural efforts to work well in controlling insect pests if not timed properly. Find out from extension and research scientists in your area what are proper timings for control of specific pests in your area. Control strategies also depend upon clientele acceptance of damage levels, scheduled events, and maintenance practices. **LM**

Cultural strategies

Equipment repair, records and inventory review, and continuing educational opportunities for staff during winter months are all important aspects of pest management.

Mapping areas of pest activity may narrow both treatment area and amount of pesticide.

A knowledge of pest history at a site and knowledge of potential insect pests specific to location are important only in the context of frequent inspection of the turf. Proper fertilization, mowing and water usage promote healthy turf which can recover quicker from pest damage. Thatch management may discourage development of some pests or enhance pesticide performance when properly timed treatments are necessary.

Watch pH breakdown

The pH of the spray water may influence the effectiveness of insecticide spray applications. Some insecticides break down in high pH water. Trichlorfon (Proxol), acephate (Orthene), and isazophos (Triumph, 9 or above) are some examples. Chlorpyrifos (Dursban) generally does not. Usually, the more water-soluble materials are more susceptible to breakdown at high pH. Pretreatment irrigation may make the difference between success and failure during dry, hot periods. Pretreatment watering does not replace watering after insecticides are applied. Rather, pretreatment watering moves soil pests closer to the surface because they are more active in moisture than dry soil. This makes contact with the insecticide or survival of biological control agents more a possibility.

No endorsement or exclusion of registered products is intended.

—Dr. Cobb □

WEED CONTROL IN ORNAMENTALS

Many methods—from hand-weeding to herbicide use—are available to control weeds in shrubs and flower beds. But a combination of methods is best, according to this extension weed scientist.

by Jerry Roche, editor-in-chief

Landscape fabric installed beneath mulch is often used as an effective method of ornamental weed control.

Sometimes, the only way you can maintain attractive ornamental beds in the landscape is by getting out there on your hands and knees and hand-weeding. But that is not the only answer, according to Dr. Jeffrey F. Derr of Virginia's Hampton Roads Agricultural Experiment Station.

"I'm a big proponent of mulching," says Derr, who spoke on the subject at the Virginia Turfgrass Conference earlier this spring.

"Hand-weeding is quite a bit of work that mulching can help alleviate."

Derr says that mulch in ornamental beds should be about two to four inches deep. "Too much could mean root rot due to excess moisture retention. Too little will allow the weeds to establish," he notes. "You should also be sure the mulch isn't infested with weed seed, and may see better weed control with mulches containing larger particle sizes."

Hand-weeding and mulching, of course, are just two of many ways to keep weeds out of ornamental beds. The others, according to Derr:

- using black plastic (polyethylene) layers over the soil base;
- using geotextiles (polypropylene and polyester) over the soil;
- applications of herbicides; and
- combinations of the above techniques.

Plastic, fabrics

Derr and his wife Bonnie Lee Appleton have numerous test plots incorporating various weed control techniques at Hampton Roads.

"Geotextiles work better than black plastic," Derr says. Geotextiles are being studied as replacements for black plastic because the latter has the following problems:

- it has a non-porous composition;
- it lacks material strength;
- it has a slick surface that does not hold mulch well;

- it can cause development of surface roots; and

- it can cause build-up of carbon dioxide under its surface.

"To avoid photodegradation, however, the geotextiles should be covered with an inch or two of mulch," he adds.

Landscape fabrics—either woven or spunbound—are being tested for weed control at Hampton Roads.

"In our experience, black fabrics have worked better than white fabrics," notes Derr. He says the problems with fabrics, however, include:

- intense site preparation prior to their installation;
- they won't control perennial weeds;
- because certain materials are lighter, installation can be more difficult;
- although it varies by material, photodegradation does occur to some extent;
- weeds can grow through or into



Jeff Derr: More research needed on post-emergence herbicide use in wildflowers.

fabrics, especially less dense materials ("Weeds seem to be able to find seams, too," Derr notes); and

- fabrics cost more than other methods of weed control.

"Fabrics have some uses, but managing the mulch layer is important with the fabrics because they generally allow root penetration by weeds.

"Where we see a potential problem," he continues, "is in landscapes that are periodically re-worked or replanted, where sections of fabric might need to be lifted and/or removed and there has been ornamental root development into and through the fabric. This could severely damage portions of landscape plant root systems if this phenomena proves common."

Derr is pleased with the weed control offered by combining mulch with geotextiles. If you are using this method, here are helpful hints:

- Use shallow mulch layers—one inch is best.
- Keep the geotextiles totally covered.
- Remove and/or kill weeds when they are small.
- Consider using a pre-emergence herbicide atop the geotextile.
- Consider using more inorganic mulches.

Chemical control

"Anything with 2,4-D in it is damaging to most ornamentals," Derr notes.

For weed control in annual and perennial flower beds, Derr says Dacthal and Treflan are available as pre-emergents; and Acclaim, Ornamec (Fusilade) and Poast as post-emergents.

"We don't have any materials for broad-leaves, though," he says. "We have to fall back to hand-weeding."

Derr says that, in all cases, herbicide labels should be consulted to



A field fabric trial at the Hampton Roads Agricultural Experiment Station, Virginia Polytechnic Institute and State University, tests fabric weed control properties.

determine which plant materials they can be used on.

Products like Devrinol, Surflan, Pennant, Casoron, Ronstar and Gallery are available as pre-emergents for woody ornamentals. Rout, Ornamental Herbicide 2 (OH2) and Snapshot (a Gallery/Surflan combination) are available herbicide combinations for woody ornamentals. For post-emergence control of grasses in woody ornamentals, Acclaim, Poast and Ornamec can be used. Basagran is labeled for yellow nutsedge control, and Roundup is a non-selective herbicide for woody ornamentals.

Control of the true grasses—johnsongrass, crabgrass, bermudagrass (wiregrass)—can be obtained with Acclaim, Poast and Ornamec, but they will not control wild onion, nutsedge or any broadleaf weed, Derr notes.

"Under high-temperature conditions, you might want to use a non-ionic surfactant instead of a crop oil concentrate with certain post-emergence herbicides," Derr says. "Also, under those conditions, you might want to hold off over-the-top applications."

Herbicides that can be used for special weed problems in woody ornamentals:

- yellow nutsedge:** Pennant, Basagran, Roundup
- mugwort:** Casoron, Roundup
- wild onion, wild garlic:** Roundup
- bamboo:** Roundup
- bermudagrass:** Ornamec, Poast, Roundup

"I lean toward wiping on the herbicide if there is a height differential between the weeds and ornamentals," Derr adds. "Try to get some Roundup to stick to the weed's leaves."

Weeds in wildflower plots are also sometimes problems. Derr says:

"We think some of the post-emergence grass herbicides have a place in weed control in wildflowers, but we've got a lot more work to do in that area."

For additional information on weed control in ornamentals, contact Derr and Appleton through the Virginia Cooperative Extension Service. Write them at: Hampton Roads Agricultural Experiment Station, 1444 Diamond Springs Rd., Virginia Beach, VA 23455. **LM**

HERBICIDES FOR GROUND COVERS

	English Ivy	Liriope	Periwinkle
GALLERY	✓	✓	
SURFLAN	✓	✓	✓
PENNANT	✓	✓	
POAST	✓		✓
ORNAMEC	✓	✓	✓

Source: Dr. Jeffrey F. Derr