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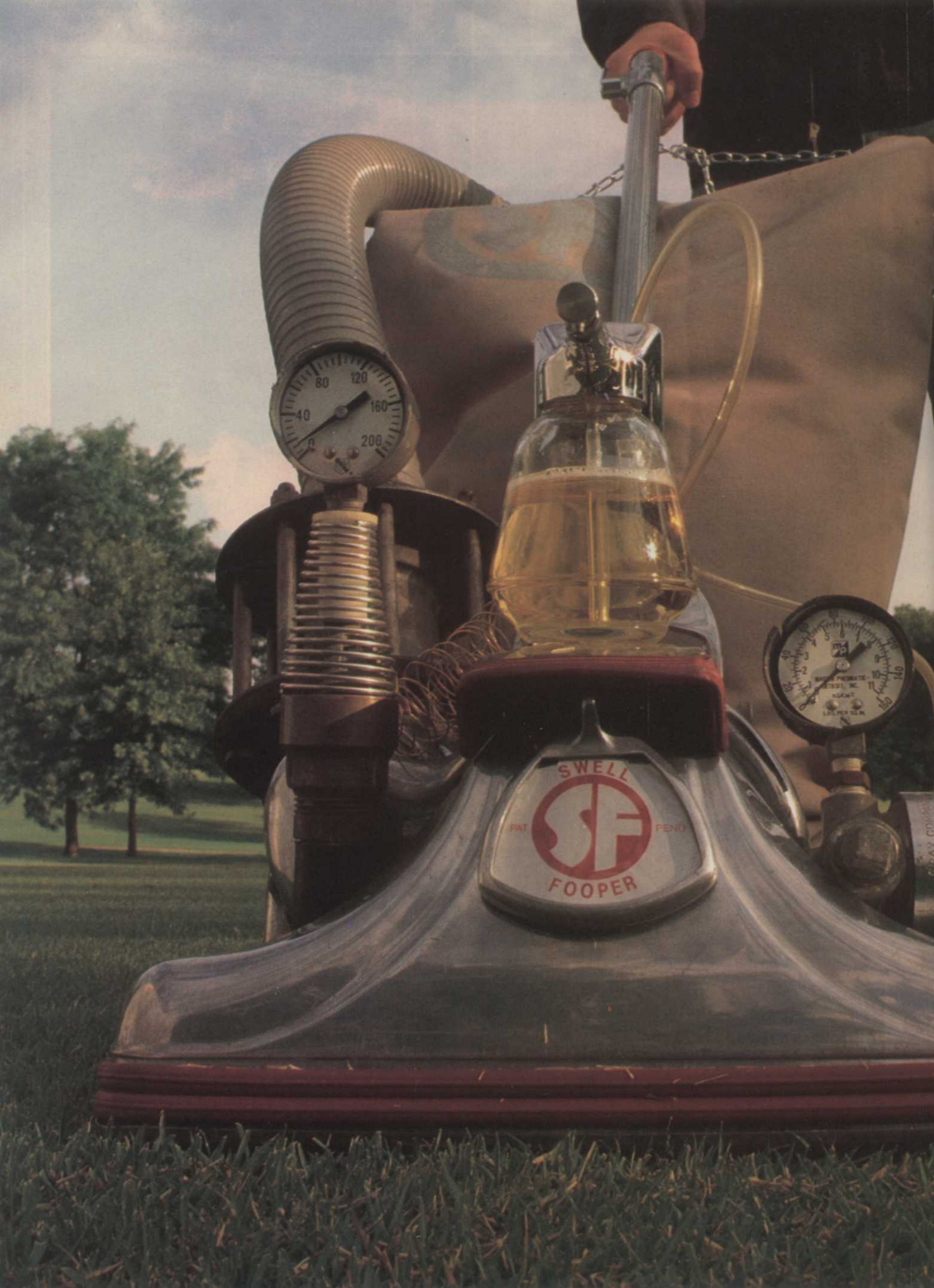
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# HOW TO TAKE OUT SURFACE FEEDERS AND GRUBS IN ONE SWELL FOOP.

To take out surface feeders like sod webworm larvae, chinch bugs, billbugs, and flea beetles, just follow these simple steps.

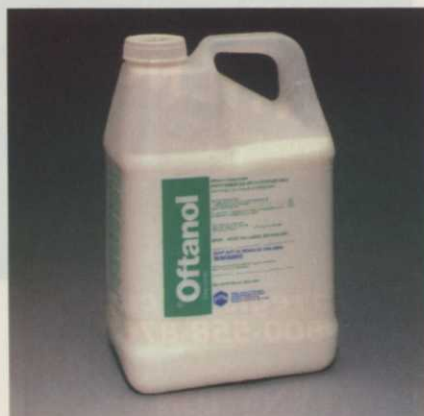
Step one, get some <sup>®</sup>OFTANOL 2 Insecticide. It's the liquid formulation of OFTANOL. If you think OFTANOL is too expensive to use on surface feeders, check out step two.

Step two, mix it at the *economical rate* and spray where the bugs are. It'll work.

The same product, OFTANOL 2, does a bang up job on grubs. Mix it at the recommended rate and spray it on. Use OFTANOL anytime, as a preventive in the spring or as a curative, whenever grubs are a problem.

Surface feeders and grubs, two serious problems with one serious solution. OFTANOL 2.

OFTANOL is also available in a granular formulation. Always read the label before use.



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ABOUT SURFACE  
FEEDERS AND GRUBS.**



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## LIGHTING from page 50

Electric lighting systems offer many options. Dimmers give the client more or less light when needed. Time clocks and photocells make the lighting system automatic. Built-in security systems add alarms and direct police communication for emergencies. System controllers let you customize the display to exact specifications.

### Putting it together

Whether a lighting system is part of an

original landscape plan or added at a later time, the design process requires some careful thought about priorities. Some points to consider:

- What are the strong points of the landscape that will be emphasized?
- What are the main walkways, views, specimens that must be illuminated?
- What hazardous areas are there? How will visitors orient themselves?
- What space will you create—the floor, walls, and ceiling with lights?
- What specific uses call for special treatment?

- What areas should be hidden or contrasted with brighter spaces?
- What mood do you want to set?
- What architectural, regulatory and aesthetic rules apply?

### Maintenance

Lighting systems should be designed with maintenance in mind. More expensive fixtures and lamps often pay for themselves with reduced maintenance costs. For instance, mercury vapor, high-pressure sodium, and metal halide lamps last much longer than incandescent lamps. This factor can make them more suitable for uses in hard-to-reach areas such as tall poles, building roofs or trees. Similarly, heavy-duty fixtures and electrical equipment give longer life than cheaper, more delicate units.

Well lights, spotlights and other fixtures used for uplighting need frequent cleaning to keep dirt and leaves from blocking off light. Sprinkler systems often leave hard water deposits on fixtures that can eventually damage housings. Underwater lights must be cleaned to prevent mineral deposit buildup on lens and housings. Normal atmospheric corrosion can damage housings in urban and ocean environments.

Hard-to-reach and multiple fixtures require much time and effort to keep the system running right and these costs should be included in the maintenance budget.

Landscape maintenance needs also change with lighting systems.

More frequent and careful pruning may be needed on ground covers, low plants and shrubs near direct light sources. You may have to relocate some light sources to avoid glare, if major pruning changes the lighted background. As trees and large shrubs grow, the cables attached to them may need realignment. Plant growth rates may change with large lighting systems. Be prepared to make adjustments.

One Washington, D.C. landscape architect installs a "temporary" system of lighting that lets clients adjust elements to their needs. James van Sweden explains, "We place double outlets in the landscape about 12 feet apart. The client can add fixtures and move them around to try different effects. This gives them as much lighting as they want." **WT&T**

*Editor's Note: The National Lighting Bureau publishes a variety of self-help guides. All are written in lay terms and are heavily illustrated. A directory of Bureau publications is available free of charge by contacting the NLB, 2101 L Street NW, Suite 300, Washington, D.C. 20037.*

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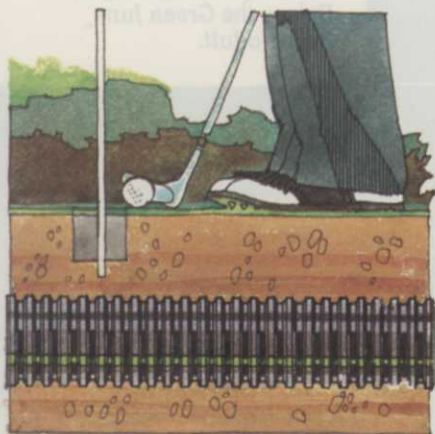
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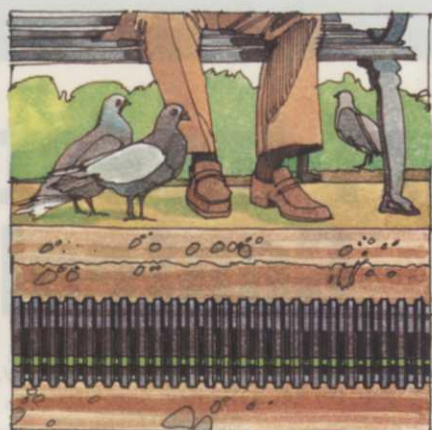
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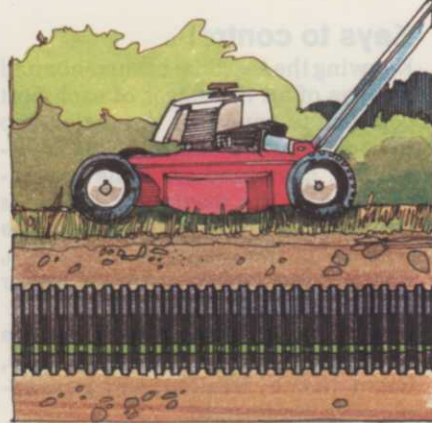
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Left, billbugs of concern include the bluegrass billbug (small) and the Hunting billbug (larger). Below, the Green June Beetle adult.



## Turf Insect Control

by Harry D. Niemczyk, Ph. D., professor of entomology, Ohio State University, Wooster, OH and Patricia Cobb, Ph. D., extension entomologist, Auburn University, AL.

Entomologists and turf specialists, by placing attention on turf varieties as well as turf pests, are discovering new control methods.

Dr. Reed Funk of Rutgers University discovered a species of fungus (called an endophyte), growing within certain ryegrasses and tall fescues. The endophyte imparts resistance to feeding by certain insects.

Further research has also identified turfgrass varieties that are highly susceptible to insect injury. Avoiding use of susceptible turf varieties and encouraging use of varieties with some resistance will reduce the need for insecticides applied to turf.

Meanwhile, insecticides remain the primary means of control as research proceeds on alternatives and supplemental methods of controlling insect damage to turf.

### Keys to control

Knowing the seasonal occurrence and damage of all life stages of each pest common to your area is a major step toward effective control. This information, combined with the characteristics of the particular turfgrass cultivar and the known length of the residual of the proposed insecticide, makes insect control scientific rather than speculative.

Still, there will be twists to confuse any control program, such as soil type, heavy thatch, weather, and poor application uniformity.

Differences between the cool- and warm-season zones and among mountains, plains, and coastal areas, also result in variations in pest species and their seasonal occurrence. Knowledge of each pest's life cycle in your area is often as important as the

choice of insecticide.

The purpose of this guide is to point out some major pests to watch out for in cool- and warm-season turfs in 1985, when their vulnerable stages occur, and some insecticides that may be used. No endorsement of named products is intended nor is criticism implied for those not mentioned.

### LATE WINTER (March)

**Chinchbugs and Billbugs**—In northern zones chinchbugs and billbugs both overwinter as adults in thatch or sheltered sites near buildings. They can become active during warm days in March. Infestations of the hairy chinchbug and bluegrass billbug occur in zoysia, Kentucky bluegrass and fine fescues.

In southern Florida, the southern chinchbug is active throughout the



year. Most varieties of St. Augustinegrass and some bermudagrasses are damaged by southern chinchbugs. Zoysia and bermudagrass are more likely to be infested by the hunting billbug.

When summer damage from chinchbugs and/or billbugs is expected in cool-season areas, a preventative application of liquid or granular Dursban® (chlorpyrifos-1 lb. AI/acre), diazinon (2.5 to 4 lb. AI/acre), or Oftanol® (isofenphos-2 lb. AI/acre) may be made as soon as these insects begin to move about. Treatment at this time controls adults before eggs are laid. If spring is early, these applications may be needed as early as the second week of March. During a late spring, applications may need to be delayed until the last week of March.

Retreatment for chinchbugs in mid to late summer may be necessary if reinfestation from adjacent untreated areas occurs.

Preventative treatments may not be successful in southern Florida where the southern chinchbug has multiple generations and is resistant to most organophosphate insecticides in some areas. In southern Florida, where resistance is a problem, the insecticides Pydrin®, Pounce®, or Baygon® have been substituted for organophosphates. Replacing susceptible turf varieties with Floratam St. Augustinegrass, a variety highly resistant to the southern chinchbug, will provide excellent natural control.

**Grubs**—The larvae of this group of pests normally overwinter six inches or deeper in the soil. If spring comes early, grub activity can be expected along with skunks and racoons who will tear up the turf searching for the grubs. Moles, who feed on grubs and earthworms, also become active at this time.

Application of Oftanol® (2 lb. AI/acre) during March when frost is gone from the ground, provides control of overwintered grubs as they return to the surface. In cool-season areas, such treatment is sufficiently residual to provide adequate control of fall grub infestation. In addition, treatment at this time also kills overwintering chinchbugs and billbugs and reduces infestations of these insects during the summer.

**Mole crickets**—Mole crickets have

extended their range from Florida and eastern Georgia into southern Louisiana and eastern Texas. Timing of treatments is critical and varies from one area to another.

The tawny and southern mole crickets are the primary pest species. Except for southern Florida, both have one generation per year. Mole crickets become active in March from north central Florida throughout their range in the Gulf States after overwintering deep in the ground as adults or nymphs. Tunnelling and some feeding damage takes place at night in moist soil and increases as mole crickets become more active. Both mole cricket species begin spring mating flights in late March. In most areas March treatment is seldom required.

**Entomologists** Dr. Harry Niemczyk and Dr. Pat Cobb.



In years when feeding of overwintered mole crickets resumes earlier than normal, Oftanol® (2 lb. AI/acre) has been used with some success. Generally, such applications are better made later in the year.

**Black Turfgrass Ataenius**—This golf course pest overwinters as an adult in the soil under debris in roughs or other protected areas. A few may be seen flying about on warm afternoons in early March. Usually this activity begins when crocus starts blooming and intensifies as the bloom of red bud appears.

While applications of Oftanol® in March may be successful in preventing summer infestations of larvae, the probability of success is increased by waiting until April.

**Greenbug**—The only stage of the greenbug known to overwinter in

northern states is the egg. Shiny black eggs deposited the previous fall may be found adhering to grass blades, fallen tree leaves, or other debris.

Treatment for the greenbug is not appropriate during the late winter.

**Sod Webworms**—The most common sod webworm species overwinter as larvae in the thatch or upper inch of soil. Feeding does not resume until hibernation (dipause) is broken by early spring warmth.

Treatment for sod webworm is usually not appropriate during late winter.

## SPRING (April-May)

**Chinchbugs and Billbugs**—As warm days of spring approach, movement of chinchbug and billbug adults increases rapidly. Generally, egg laying begins the first week of April on warm-season turf and the first week of May on cool-season turf. Occasionally adult billbugs can be seen wandering about on sidewalks on warm afternoons.

Generally, application of insecticides to prevent infestations of chinchbugs and billbugs should be completed by the first week in May in cool-season and mid-April in the South. Such applications are made before significant numbers of eggs are laid. This time may vary as much as a week or more depending upon the spring weather.

When the preventative approach is not used and southern chinchbugs are detected in May, diazinon (4 lb. AI/acre) provides control. In areas with three to five generations, two retreatments at six week intervals may be needed.

**Grubs**—Overwintered grubs return to the surface and begin feeding on turfgrass roots in April. Increased activity and damage from moles, skunks, and racoons foraging on grubs can also be expected. Feeding by mammals and grubs continues through May.

In cool-season areas, a single application of Oftanol® (2 lb. AI/acre) made during April has been successful in controlling overwintered grubs with one year life cycles and preventing subsequent infestations during late summer. Application made during May may not provide immediate control, however, prevention of the late summer infestations may be expected.

Infestations of such grubs can also be controlled during April (South) or May (North) by spot or general treatment with Turcam® (bendiocarb, 2 lb.

*continued on page 60*









# HOW TO GET THE BEST DISEASE CONTROL FOR LESS COST THAN THE SECOND BEST.

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Shown left, mole cricket damage to home lawn.

throughout the southern areas of the Gulf States. Mating and dispersal flights continue as egg laying and hatching begin.

Spring treatment is often necessary in areas that were severely damaged last fall. Small damaged areas can be rolled or otherwise packed down so the turf roots are reconnected with the soil. To determine cricket presence, pour soapy water (2 oz. liquid dishwashing detergent in one gallon of water) on turf areas where infestation is suspected. Crickets will usually surface in 3 to 15 minutes (longer in cool weather).

Turcam® (2 lb. AI/acre), diazinon (spray or granules, 5-6 lb. AI/acre), Mocap® 10G (ethoprop, 10 lb. AI/acre, commercial turf only), or Oftanol® (granular or liquid, 2 lb. AI/acre) can be used to control spring infestations.

In less critical areas, short residual treatment with Turcam® (2 lb. AI/acre) or diazinon (5-6 lb. AI/acre) applied in late April or May may be adequate.

Critical turf areas may require greater residual control provided by early April insecticide applications. Mocap® 10G (10 lb. AI/acre) provides up to four weeks control and Oftanol® (2 lb. AI/acre) up to eight weeks control. Treatments should be made late in the day if possible and watered in immediately.

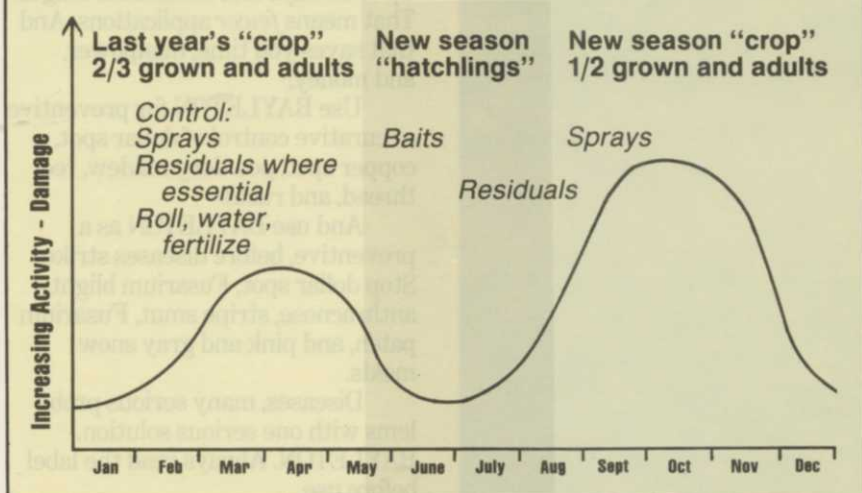
**Black turfgrass ataeinus**—Adults of the black turfgrass ataeinus can be seen flying about in April and are often found in clipping catchers after early mowing of golf course greens. These adults begin laying eggs in early May, or about the time Vanhoutte spirea first comes into bloom. Check with local extension for a more precise time if needed.

Applications of Oftanol® during April or May has successfully prevented larval infestations during the summer. Diazinon (5-6 lb. AI/acre) applied to fairways during egg laying kills adults and also prevents the development of summer larval infestations.

**Sod webworms**—Overwintered larvae of the sod webworm begin feeding as soon as the grass begins to grow. Usually damage is insignificant, but areas that do not green up may be infested. These areas frequently have probe holes from starlings feeding on the larvae.

In warm-season areas webworm larvae pupate during late March and

## Seasonal Mole Cricket Activity in Central Gulf Coast Areas



AI/acre), Proxol (trichlorfon, 8 lb. AI/acre) or diazinon (5-6 lb. AI/acre). Golf course superintendents may also use ethoprop (Mocap®, Scotts Nematicide/Insecticide, 10 lb. AI/acre). Sevin® (carbaryl, 2-4 lb. AI/acre) has been effective against larvae of the green June beetle.

Treatment should be delayed until grubs are in the top one inch of soil. Irrigation or rainfall should follow such applications to move the insecticides to the target grub as soon as possible.

Although milky spore disease products for control of Japanese beetle grubs may be applied anytime there is no frost in the soil, spring is a good time for such applications. The soil is open and frequent rains move the disease spores into the soil. It should be noted that only the Japanese beetle

grub will be affected by milky spore.

Infestations of large grubs (larvae of June bugs) have been occurring on a three-year cycle in some areas of Michigan and Minnesota. Locations of such infestations should be identified because reinfestation is likely every three years.

Controls such as Oftanol®, diazinon, Proxol®, or Turcam® should be applied in August or September during years of when large numbers of adults are seen.

Eggs are laid in May and June, therefore treatment should be made in late summer, early fall of that year or early the next spring while the larvae are small. Later applications against full-grown larvae have given inadequate control.

**Mole crickets**—Damage increases in April from north central Florida