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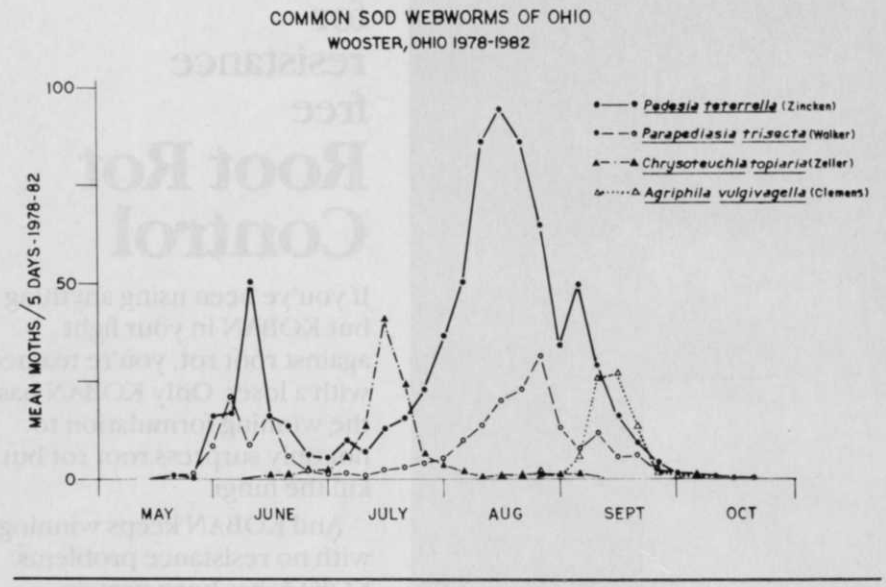

Nematicide/Insecticide, 10 lb. AI/acre). Sevin (carbaryl, 2-4 lb. AI/acre) has been effective against larvae of the green June beetle.

Treatment should be delayed until grubs are in the top one inch of soil. Irrigation or rainfall should allow such applications to aid in moving 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 and thatch. It should be noted that only the Japanese beetle grub will be affected by milky spore.

Incidents of large grub infestations (larvae of June bugs) have been increasing in cool-season areas over the past three years. 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 application against full-grown larvae have given inadequate control.

Mole crickets—Damage increases in April from north central Florida throughout the southern areas of the Gulf States. Mating and dispersal flights continue as egg laying and hatching begin.

Spring treatment may be 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/acrea), diazinon (spray or granules, 5-6 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. Orthene, 755 Tree and Ornamental Spray (2 lb. AI/acre) applied late in the day and left unirrigated overnight may provide quick knockdown but little residual.

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 immediately.

Black turfgrass ataenius—Adults of the black turfgrass ataenius 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 entomologists for 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.

A word of caution—diazinon applications may be toxic to waterfowl such as geese feeding on the treated turf.

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 early April. Moth flights begin in April in southernmost areas and during May in more northern areas.

Young larvae are usually present about two weeks after the spring moth flight peaks, so treatment of young larvae can be done in May in some areas.

Damage from the burrowing sod webworm may be evident in late May in the South. Rubbing a hand over turf suspected of being infested expares larval burrows that are covered with a flap of duff and grass clippings.

When necessary, a wide range of insecticides including diazinon, Proxol, Aspon, Sevin, and others applied at labelled rates may be used to achieve control.

Cutworms—Moths of cutworms begin laying eggs on golf course greens and other turf areas in the spring. These eggs hatch producing larvae that feed on grass blades during the night. The black cutworm is the most common species on cool-season turf.

While visible damage in uncommon on home lawns, damage can be significant on golf course greens in late May.

Black, granulate, and variegated cutworm moths become active in March and April in the South. Larvae are present on turf, especially on golf greens and tees. Damage can become evident as early as mid-April. By May, the larvae are large enough to cause severe damage.

Generally the insecticides effective against sod webworm are also ef-

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Green June beetle grubs in their natural habitat—the turf.

fective against cutworms. The *target principle* of controlling these pests is to apply the insecticide late in the afternoon and allow night feeding cutworms to contact and feed on the treated foliage. Irrigation following liquid application is therefore not advisable unless specified on the product label.

Greenbug—Greenbug eggs begin hatching as early as April, but significant infestations do not develop until later in the year. Aphid numbers are too low to detect.

Winter grain mite—Damage from this mite is often first noted in April when turf areas are receiving spring fertilizer applications. By late May, the mites will have laid their eggs and died. Mites do not appear again until the eggs hatch in October.

If treatment is necessary, liquid diazinon or Dursban will provide control.

Clover mite—Incidents of visible damage to home lawns has been seen in April in several Ohio cities and Denver, Col. Usually a nuisance pest in and around homes, the clover mite appeared in large numbers (5,000 per sq. ft.) across entire lawns and on turf next to building foundations. Symptoms of injury were the same as the winter grain mite. Turf next to foundations was often killed.

The clover mite has a slightly pink body and eight pale colored legs. The first pair of legs are extremely long and protrude well out in front of the mite. The absence of bright red legs distinguishes the clover mite from the winter grain mite.

Treatment with liquid diazinon (2.5 lb. AI/acre) or Dursban (1 lb. AI/acre) readily provides control.

Fire ants—Fire ants are spreading across much of the South causing serious and painful injury to man and animals. They begin establishing new mounds during warm, wet days of spring. During this time, ants are active near the surface of mounds and workers are foraging for food.

Mound treatments include diazinon granules or drenches; Orthene 755 dust, various Dursban formulations, Oftanol, or MC-96 (trichloroethane). Read the label for specific directions for mound treatment. Do not disturb the mound before or during treatment.

Where mound treatment is impractical, the turf can be treated with Amdro fire ant bait (no more than 1.5 lb. AI/acre). All the bait should be used within three days of opening. Retreatment during the fall is usually necessary.

Summer (June-August)

Chinchbugs—In northern cool-season turf, chinchbug eggs continue to hatch into June. Bright red nymphs appear. The number of chinchbugs increases rapidly in June and peaks in July and August when northern lawns can receive severe damage. This damage is often masked by summer dormancy of turf caused by drought. Hot, dry conditions are ideal for chinchbugs.

During August the nymphs molt into adults that mate, lay eggs, thus producing a second generation. Some northern areas have only one generation per year.

Southern chinchbugs are not usually a problem in well-irrigated turf or during summers when rainfall is plentiful. Southern chinchbug-damage first appears during the dry periods of June and July. Damage may continue throughout the summer and into the fall because of overlapping generations.

A wide range of insecticides may be used at label rates to control existing infestations. They include Dursban, diazinon, Aspon, and Sevin. Treatments should be made before injury is severe, otherwise, damaged areas may not recover.

Areas of southern Florida have pockets of southern chinchbugs resistant to these insecticides. Pydrin, Pounce, or Baygon may be substituted. Floratam St. Augustine, a chinchbug resistant variety, should be the primary turf variety grown in more southern coastal areas and Florida where southern chinchbug is a problem.

Billbugs—The bluegrass billbug larvae feed in grass stems during June and move to the plant crowns and roots and rhizomes during July. This feeding causes brown spots that frequently resemble the symptoms of some fungus diseases. Symptoms are also often masked when the turf is dormant from drought. The larvae usually move deeper into the soil under dry soil conditions. During late July and August the larvae burrow deeper into the soil to pupate and transform into adults.

Infestations discovered during this time may be treated at the same rates used for existing grub infestations with diazinon, Turcam, and Proxol.

Southern chinchbugs are not usually a problem in well-irrigated turf or during summers when rainfall is plentiful.

Irrigation or rain following application is helpful for optimal results. If larvae are feeding in the foot zone, control may be difficult to achieve. Insecticide applied during June should control feeding larvae.

Grubs—By June, in cool-season areas, grubs have stopped feeding and are in the pupal stage three to four inches in the soil. Beginning in mid-June and continuing through mid-July, the adults of various species emerge and burrow into the soil to lay eggs. Hatching and appearance of young larvae occur during July and August.

In warm-season areas, beetle flights continue and often peak in June, although the time flights occur varies from year to year. Japanese beetle flights occur mainly from mid to late May and June. Brown May or June beetle flights often follow heavy rains in late May and June. New generation grubs of most southern species can be found by mid-August.

Existing infestations of grubs found in July or August may be treated with Proxol, Turcam, Oftanol, diazinon, or Mocap (commercial turf only) at standard label rates. Sevin (2-4 lb. AI/acre) is effective against the green June beetle larvae.

Extreme heat and drought during the summer may cause some grubs to

continued on page 38

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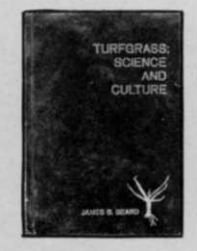

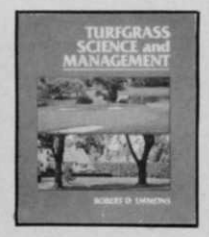

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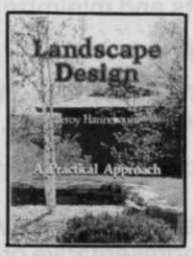

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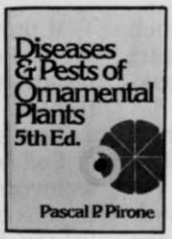

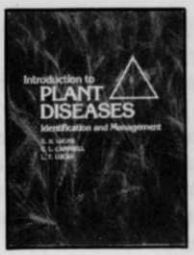

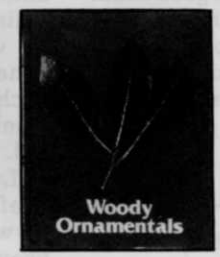

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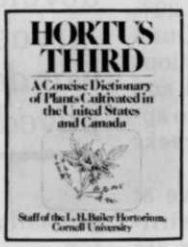

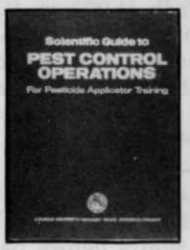

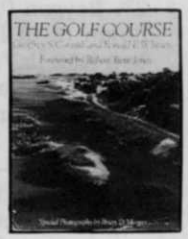

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move deeper in the soil. Under such conditions, irrigation several hours before treatment and a thorough soaking afterward is advisable.

Mole crickets—Egg laying diminishes in late June, and newly hatched nymphs of both species feed voraciously. Tunneling damage suddenly becomes obvious in July as the nymphs grow larger. Because of the potential for sudden damage at this time, turf areas should be inspected several times a week during this period.

Bait formulations have been effective in controlling mole cricket nymphs from June through August in the area from central Florida north and west through the Gulf States. Baits work best in eastern Georgia during spring and fall. Bait applications often must be repeated one or more times.

Bait formulations available include: 2% Baygon (½ lb./1,000 sq. ft.), 20% Sevin (5-10 lb. bait/acre), 5% Dursban (150 lb./acre or two applications of 75 lb./acre three weeks apart), and 2% malathion (100 lb./acre or two applications of 50 lb./acre three weeks apart).

Mole crickets are more active at night in moist soil. Turf should be irrigated several hours before baits are applied. Delay application until later in the day and do not irrigate for two-to-three days thereafter. Orthene 755 Tree and Ornamental spray (2 lb. AI/acre) can be applied late in the day and left unirrigated. However, retreatment may be necessary due to short residual activity.

Residual control of mole crickets with Oftanol (2 lb. AI/acre) may vary with location and amount of rainfall. Applications of Oftanol have given up to 12 weeks control from the Florida panhandle along the Gulf Coast. Residual control was only six weeks in areas where August rainfall exceeded eight inches weekly. Oftanol works faster on mole cricket nymphs when watered in immediately.

Black turfgrass ataenius—Eggs laid by beetles during May hatch in June and the larvae immediately begin feeding on the turf roots and thatch.

From late June to mid-July, symptoms of injury include wilting in spite of irrigation. In July, larvae move deep into the soil, pupate and emerge as adults. These adults lay eggs during August producing a second generation in states such as Ohio. The second generation larvae are capable of damaging turf.

If preventative applications of insecticide were not made, existing infestations may be spot or generally treated with Proxol, Turcam, diazinon, or Mocap at label rates.

Sod webworbs—Damage from sod webworm larvae occurs occasionally in most of the cool-season turf region. Injury is more common in midwestern states and is usually seen in July and August. Older sod fields and heavily thatched turfs are good candidates for infestation. There are generally one or two generations per year, depending upon the species.

In warm season areas most sod webworms complete at least three generations a year with overlapping generations toward the end of the season.

During September, billbug adults that developed from summer larvae are often seen wandering about on paved surfaces.

Damage is most severe from late June through August. In southern Florida where the tropical sod webworm is active throughout the year, damage is most severe in late summer and fall.

Hybrid bermudagrasses are favored by sod webworms, but damage occurs on other warm season grasses. Webworm damage to bermudagrass often superficially resembles symptoms of some diseases. Flushes of soapy water can be used to determine the presence of sod webworm larvae.

Insecticide applications should be made when larvae are present and/or one to two weeks after peak moth flight.

Formulations of Dursban, diazinon, Sevin, Proxol, or Aspon applied at labelled rates provide control. Retreatment may be necessary depending upon the location and number of generations.

Cutworms—Cutworm larvae continue to cause possible damage to golf course greens from June through August. These larvae pupate in the soil or thatch and emerge as moths that lay eggs for additional generations.

Cutworm larvae can be controlled with a wide range of insecticides label rates; including Dursban, Proxol, Aspon, Sevin, and others. Irrigation following liquid applications are generally not advisable unless required on the label.

Fall armyworm—The fall armyworm is seldom a problem of cool-season turf.

But in the South, summer always means the arrival of the moths of this migratory pest. Although in mild winters fall armyworms may overwinter among the Gulf Coast, it is generally believed that the moths are blown in on winds from Central and South America. Several generations occur each season, one about every five weeks. Generations overlap in the fall.

Lush, green bermudagrasses are preferred. By late June, fall armyworm damage to turf has usually been reported along the Gulf Coast. Damage is seldom permanent, unless drought and/or heat stress follow.

Fall armyworms may feed anytime furing the day but are most active in the early morning and late evening.

Treatment is most effective at these times. During hot, mid-day hours, larvae may retreat into the thatch.

Insecticides such as diazinon, Sevin, Dursban, and Proxol can be used at labelled rates to control fall armyworm.

Greenbug—Damaging populations of greenbug can occur from June through August. Populations and incidents of damage frequently varies from area to area, even within a city.

Symptoms of injury include turf under the dripline of trees and in open areas having a burnt orange color. When symptoms are seen, numerous aphids (40 or more) may be seen on a single grass blade. Close examination of damaged turf is necessary because the aphids are small. If left untreated, a heavy infestation can kill the turf.

Greenbug infestation may be controlled with liquid treatments of Dursban (1 lb. AI/acre), diazinon (2-5 lb. AI/acre), or Orthene at labelled rates. If reinfestation occurs following treatment with Dursban or diazinon, Orthene at labelled rates has been effective.

Fire ants—Fire ants are more difficult to control during hot, summer days because they are deeper in the soil. However, during rainy periods, they may become active and establish new mounds. Treatments during these months should be applied early in the morning before the heat of day.

Scale insects—Although Rhodesgrass scale is present in Gulf Coast areas throughout the year, damage be-

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