

How the chinch bug develops. Note gradual loss of immature white band through growth of wing pads. Each stage gets darker, from original nymphal red to adult black. Nymphs are most damaging.

How to Identify and Control Insect Pests in Turf

Part 2

This is the conclusion of an original research article prepared by the technical staff of Weeds and Turf, in cooperation with state experiment stations around the country. Part I, which appeared last month, discussed basic principles of insect control in turf, and dealt specifically with beetle grubs, miscellaneous beetles, and sod webworms. Ed.

Other Moth Lawn Pests

Family Phalaenidae of the moth and butterfly order foster a number of agricultural and horticultural pests known collectively as cutworms.

Armyworms are very destructive and widespread larval moths of the cutworm family. Adults are pale brown to buff, night flying, nectar feeders, with one small white

spot in the center of each front wing. The species designation *unipuncta*, meaning "one spot", is one way of remembering this pest, *Pseudaletia unipuncta* (Haworth).

Wingspread is about 1½ inches. Females lay eggs, from 25 to 100, in folds and under grass leaves. One female may lay as many as 2,000 eggs a season. Small greenish larvae hatch in about 10 days. Maturation takes 3 to 4 weeks; greenish brown, longitudinally striped larvae, 1½ inches long, pupate and emerge as adults after 12 to 14 days pupation. There may be 3 broods a year in northern states; in the South, different life stages can be found in soil year around.

Larvae hide in litter on the soil and in crowns of plants during daytime. Night and evening (and cloudy day) feeding results in grasses being chewed off completely. When food supplies are exhausted in one area, armyworms band together and march off to greener pastures. From this habit they get their common name.

Recommended control chemicals are chlordane, dieldrin, heptachlor, toxaphene, DDT, and Sevin. Chlordane, dieldrin, and heptachlor follow sod webworm dosages (⅓ pound active ingredient dieldrin or heptachlor per 5000 square feet; 9 ounces active chlordane per 5000 square feet). Sevin is applied in both the North

and South at 1 pound active per 5000 square feet.

Toxaphene and DDT are the main munitions against the fall armyworm, *Laphygma frugiperda* (Smith), in Florida. This species, often called the green grassworm, is more bothersome and more frequently encountered on cultivated turf.

Larvae of fall armyworms resemble true armyworms but have a prominent inverted white "Y" on the front of the head, and longer hairs arising from black tubercles on the back. On the true armyworm, these spots and hairs are less conspicuous. Adults have dark-gray mottled forewings and grayish-white hindwings. In habits and life cycle, the fall armyworm resembles the true armyworm. Toxaphene and DDT are applied at the same rates as prescribed for sod webworms.

A number of additional species in the family Phalaenidae are capable of doing extensive damage to turf. These are cutworms.

Professor Andrew S. Deal, of the University of California at Riverside, told *Weeds and Turf*: "Cutworms have been more prevalent in dichondra lawns (a favorite in southern California) during the past five years than they were previously. Many lawns have been damaged before the owners realized that cutworms were present."

Cutworms are similar in form and size to the moth species described previously; they differ mainly in coloration and pattern-



Chinch bugs reveal themselves by floating to top of water in bottomless can which has been inserted into edge of infested area and filled

ing. Other members of the family are called loopers and underwings. Chemical control measures are the same as for armyworms. Control on dichondra lawns is best using DDT or toxaphene. The same pyrethrum test may be made for all Phalaenids, and chemicals should be applied in late afternoon, if possible, because insecticides will then have greatest effectiveness against these night feeders.

Chinch Bugs

The chinch bug is the greatest offender among those insects which suck plant juice. Nymphs, which account for greatest damage, are colored a bright red with a white band across the back. Infested areas show up as brown dead areas, sometimes just a foot or two in diameter. If left unchecked, a whole lawn may be destroyed. In the North, bentgrass is most susceptible; in the South, St. Augustine is damaged most heavily.

As nymphs mature they become darker in color; development takes 30 to 40 days. Adults are $\frac{1}{6}$ to $\frac{1}{5}$ inch long (not as long as some blades of grass are wide) and black. Each white wing cover is marked with a black triangle on its outer margin. Some of the immature red coloration is retained on the legs.

At least two forms of chinch bug are bothersome in United States. The hairy chinch bug, *Blissus leucopterus hirtus* (Montandon), a short-winged form, is a pest in the northeastern states, while *Blissus leucopterus insularis* (Smith), the lawn chinch bug, is prominent and damaging in the South. *B. leucopterus*, although distributed throughout the Mississippi Basin, is not listed as a turf pest by Indiana, Kansas, or Iowa, nor is its damage accounted in California and other states west of the Rocky Mountains.

"The lawn chinch bug is acknowledged by entomologists to be the major turf pest in all the Gulf States except Texas," reports Professor Kerr from Florida. He further states that the chinch bug is "evidently resistant to DDT in much of Florida and to parathion in some 'hot spots.' Other organic phosphorous insecticides and carbamates can control these populations."

When asked about insect resist-

ance, Professor Milton G. Savos of the University of Connecticut at Storrs replied to *Weeds and Turf* that in his area controllers have encountered "no problem with resistance with the possible exception of the chinch bug to chlordane, dieldrin and DDT."

In Florida, in addition to chlordane, dieldrin is ineffective against *B. leucopterus insularis*, according to Professor Kerr.

Chemicals usually recommended in the Northeast for chinch bugs are chlordane at $1\frac{1}{4}$ pounds active, diazinon at $7\frac{1}{2}$ ounces active, dieldrin at $\frac{1}{3}$ pound active, and Sevin at 1 pound active, all per 5000 square feet,

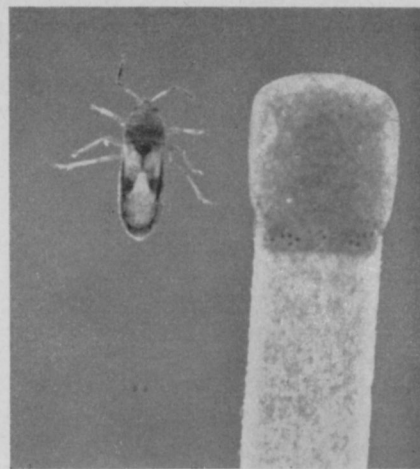
Munitions used against *B. l. insularis* in Florida's program are parathion, from 2 to 4 pounds active ingredient per acre; diazinon, from 4 to 8 pounds active per acre; V-C 13, maximum of 3 pounds active per 5000 square feet; Trithion, at 12 ounces active per 5000 square feet; and Ethion, at about 1 pound active chemical per 5000 square feet. The most recent addition to recommendations for Florida spraymen is ASP-51 (Stauffer), to be used at 10 pounds active ingredient per acre.

Although Zytron, the pre-emergence crabgrass killer, has not yet been registered for insect control, tests have shown it effective against chinch bugs in Alabama.

Easy Chinch Bug Test

In order to make a proper diagnosis of a lawn ailment, a test similar to that mentioned for webworms and cutworms should be made. To make this test, cut both ends out of a large can (a 2 pound shortening can will do). Force this can into the soil 2 to 3 inches deep at the edge of an area which appears to be damaged. Fill the can with water and wait about five minutes (you may have to add more water). If chinch bugs are there, they will float to the top of the water and can be positively identified. In addition to identifiable body characteristics, chinch bugs give off a vile odor when crushed.

As a postscript on chinch bugs, it should be mentioned that fertilization with soluble nitrogen may assist chinch bug development just as it assists grass



Size of adult chinch bug as compared to paper match head. Adult chinch bug is $\frac{1}{5}$ inch long.

development. Workers in Florida suggest that heavy nitrogen fertilization be held up until fall to discourage chinch bug population explosions.

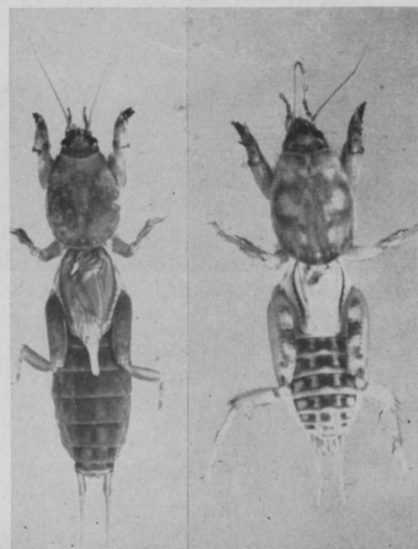
Other Lawn Pests

Clover mites (Tetranychidae) may inhabit lawns in some areas where there is plenty of moisture in the soil. Mites are usually noticed by homeowners when they move indoors during cooler weather. Someone reporting mites would probably describe them as "small, moving red spots." They are typically less than $\frac{1}{30}$ inch long, and red.

According to a bulletin prepared by Dr. Harold Gunderson of Iowa State University: "On approach of cold weather . . . it is the search for protective sites for oviposition, molting, and hibernation that leads clover mites to accidentally enter buildings and become a nuisance."

Removal of an 18-inch strip of grass around the foundation (if
(Continued on page W-26)

Immature mole crickets of the genus *Scapteriscus* do just as much damage as adults. Note reduced wings, naked abdomen, expanded front legs and broad thorax which houses powerful digging muscles.



Lawn Insects

(from page W-15)

grass is touching) of a home will bring some protection. Prevention of mite entry is doubled if malathion or lindane is applied to this cleared strip. Actual control in the lawn is very difficult.

Another mite was reported by Professor Deal of California who quoted reports of Dr. R. N. Jefferson, also of Riverside. "The Bermudagrass mite (Eriophyidae) lives in the terminal leaf sheaths and its feeding causes stunting, a witches-broom effect, general decline, and eventual death of the stolon." This pest was first observed in Arizona by the California workers in 1959. Since then it has become a pest in southern California. It also causes damage in Nevada, Texas, and Florida. Control it with Trithion or Ethion at chinch bug dosages.

Dr. Jefferson has also reported on the frit fly (*Oscinella frit*), "a new pest in the sense that damage to turf has occurred in California since 1959. The tiny maggots, or larvae, tunnel in the stems near

the surface of the soil causing the upper portions of the plant to turn brown and die." Adults can be detected by placing a white object in a suspect area; small flies $\frac{1}{16}$ inch long, will be attracted to the object readily. Insecticides effective for chinch bugs and sod webworms will control the frit fly, which ranges into the northeastern quarter of the United States also.

Cicada Killer

A pest in Indiana and elsewhere in central and northeastern United States is a species of digger wasp called the "cicada killer." Professor Dave Matthew of Purdue told *Weeds and Turf* that these "annually cause great concern to many homeowners because of the mounds of soil they pile up on lawns when digging burrows in which they place paralyzed cicadas on which their young feed." These wasps, about $1\frac{1}{2}$ inches long and typically marked with yellow and black, can sometimes be seen hovering over or near their burrows regularly each day during mid-summer. They will not bother humans unless molested.

In one sense, the cicada killer

is beneficial because it is a natural control of cicadas. If turf damage by wasps is extensive, control of these "middle-of-the-roaders" is recommended. Chlordane 10% dust, applied locally (spot treatment) to burrows where returning wasps will walk over it, will give control.

Mole crickets burrow through soil with their enlarged spade-like front legs. They eat roots and uproot seedling and some established grasses. These oddities are about $1\frac{1}{2}$ inches long, brown, and covered with velvety hairs. Mole cricket control is the same as mentioned for other soil-dwelling insects such as white grub and sod webworm. If chlordane is used, the applicator should remember that it is also a weedkiller and should not be used on new lawns. Give seedlings a 5-week head start.

In all cases study and understand the package label. Regardless of the chemical used, follow directions and precautions for safe handling. Have the safety of consumer, children, pets, and wildlife that may come in contact with a treated area firmly in mind.

Mr. Contract Applicator:

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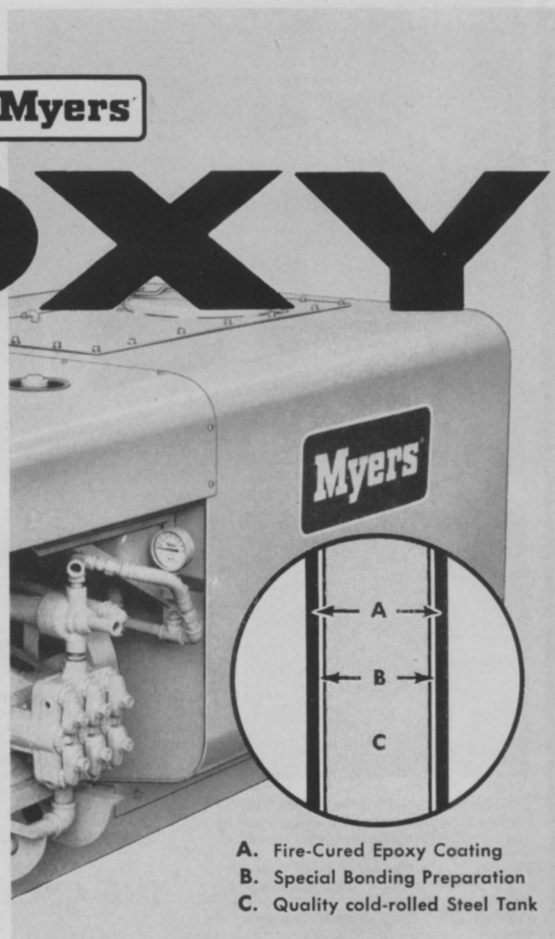
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