

LAWN INSECT CONTROL AND CURRENT INSECTICIDES

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Successful control of any insect pests depends on three factors: PROPER IDENTIFICATION of the pest, knowledge of the the LIFE CYCLE, and selection of an APPROPRIATE INSECTICIDE. In this session we will discuss four common lawn turf insect pests, including the identification of the pest, symptoms of infested lawns, the life cycle (including the overwintering stage and the stages which are most vulnerable to chemical control), and chemical control (including the proper timing for pesticide applications for that pest and any special efforts that might enhance the effectiveness of the insecticide).

WHITE GRUBS

There are many species of white grubs which infest a wide range of turfgrasses. Perhaps the most familiar species is the Japanese beetle, but the northern and southern masked chafers, June beetle, European chafer, and asiatic garden beetle also can occur in large numbers and cause substantial damage.

Identification

White grubs all have a very characteristic appearance. They are typically cream colored with a brown head, and the body is curled into a C-shape. There are three pairs of legs, just behind the head. Grubs may be observed dragging a straightened body along the soil surface if they are disturbed. Often the tail end is gray or brown. The pattern of hairs and the anal slit, all on the tail end, are used to identify the various species of white grubs. Grubs range from 1/8 inch when young to an inch or more in length when full grown.

In northern climates, where soils normally retain some moisture throughout the summer, most grubs remain within four inches of the soil surface during the growing season, feeding on turf roots. In hotter climates, where soils can heat up and dry out dramatically, grubs apparently migrate vertically to avoid desiccation. Infested turf stands can be rolled back like carpet because grubs have destroyed the underlying root system.

Life cycle

Most species of white grubs have a life cycle similar to that of the Japanese beetle. Adults emerge in July, mate, and lay eggs in the soil. The eggs hatch after 7 to 10 days, and tiny larvae (grubs) begin feeding on turf roots immediately. The tiny grubs feed for about two weeks, molt to a larger size,

feed for another three or four weeks, and molt again (usually in late August) to the third, and largest, grub stage. This stage continues to feed into October and then migrates downward in preparation for winter. The grubs spend the winter in "hibernation", just below the frost line, and return to the turf roots in the spring when the ground thaws. The grubs feed through May, pupate in June, and emerge as adults in July to repeat the cycle. Normally there is one generation per year, but in some northern areas, some individuals take two years to complete development. The extra year is spent in the second grub stage. Some species typically spend two or three years completing one generation.

Control

Several chemicals are labelled for use on at least one white grub species. Some of these include diazinon (6 lb ai/A), Mocap or Scotts Insecticide/Nematicide (5 to 8 lb ai/A), Oftanol or Scotts Insecticide IV (1.5 to 2 lb ai/A), Proxol or Dylox (8 lb ai/A), and Turcam (4 to 6 lb ai/A). Check the label for the appropriate application rate. Our field studies indicate that formulations for the same active ingredient are equally effective, assuming the application rate and operating procedures are proper.

Any white grub insecticide application must be watered in thoroughly, to drive the active ingredient through the thatch and into the soil. At least one inch of water should be applied immediately after the application. It is virtually impossible to apply too much water as far as most grub insecticides are concerned, but of course turf maintenance limits the amount that can be applied safely. When in doubt, err on the side of more water.

In the case of the Japanese beetle (and most one year generation white grub species), applications during the egg laying period are most effective, assuming adequate water is available. This egg laying period generally is in August for the Japanese beetle, but may range from late June through mid September for other species, depending on local conditions. Often the availability of water is limited in late summer, but if a rainstorm is inevitable, an application can be made just before the rain. An alternative approach is to treat the area in the spring, just after the grubs have returned to the root zone. In Massachusetts this usually occurs in mid to late April. Although the grubs are nearing their maximum size and somewhat harder to kill in the spring, the reliable and heavy spring rains drive the insecticide into the soil and it normally works quite acceptably.

CHINCH BUGS

Identification

The hairy chinch bug occurs on northern grasses including bluegrass, fine fescues, and bent grass. Adults are 1/5 inch long, black with white wings visible on part of the back. Immatures range from 1/20 inch to nearly 1/5 inch. They have the same shape (elongated ellipse) as an adult, but vary in color from bright red with a white band when very young to orange to orange-brown and eventually black.

Chinch bugs often occur in large numbers on sunny areas of lawns, and can cause substantial damage by sucking fluids from the plants and disrupting water conduction within the plant. Affected plants wilt, turning yellow and brown. Infested areas appear to be under drought stress, and in fact they are because of the feeding activity. Injury is most severe when large numbers of chinch bugs infest turf that is already dormant from moisture stress, so heaviest damage is reported in the middle of hot, dry summers.

Life Cycle

Chinch bugs overwinter as adults in protected areas, such as tall grass of plant debris. In the spring the adults move to growing turf, feed, and mate. The female then lays 100 to 500 eggs over a four week period, inserting eggs in or on lower leaf sheaths or stolons. Immatures hatch and begin to feed immediately by sucking plant juices. They go through four or five molts before becoming adults. The rate of development is directly related to temperature. For example, one generation may take six weeks at 83° F and 17 weeks at 70° F. Normally there will be one or two generations in areas like Michigan and Massachusetts.

Control

Several insecticides are labelled for chinch bug control. Note that application rates usually are lower than for soil insects such as white grubs. Some of the chinch bug insecticides include Aspon (4 to 8 lb ai/A), diazinon (1 to 2 lb ai/A), Dursban (1 lb ai/A), Oftanol (1 to 2 lb ai/A), and Sevin (8 lb ai/A). Apparently control is enhanced if the affected area is watered lightly before treating. Liquid formulations should be applied in 15 to 20 gallons of water per 1,000 square feet. Granular formulations should be watered in lightly to move the granular into the thatch.

The standard approach in the Northeast is to apply an insecticide in June, as the young immatures are beginning to emerge. A second application may be necessary, two to three weeks after the first application. Normally mid or late summer applications, made after damage has become apparent, are not satisfactory because the chinch bug population has already built up to very high levels (100 to 400 per square foot). Another school of thought supports application in May, as adults are laying eggs and before immatures hatch. The rationale is that the population never has a chance to get established.

In any case, insecticide applications directed toward chinch bugs are vastly different from those directed toward white grubs or other soil inhabitants. Specifically, chinch bug insecticides should not be watered in heavily, because you want the active ingredient to remain in the thatch and above ground tissue.

BLUEGRASS BILLBUG

Identification

The bluegrass billbug damages Kentucky bluegrass by feeding at the base of the stem and in the crown. Young larvae tunnel in stems. Damaged turf can be pulled out very easily, with stems breaking off at the crown. As larvae feed in the crown, they leave behind fine, light-colored sawdust-like material in the root zone. If accumulations of this "sawdust" are observed, you can suspect a billbug population.

Billbug larvae (grubs) are legless, cream-colored with brown heads. They have no distinctive shape, but are relatively small (up to 1/4 inch), with several small folds of skin. Often there is a small gray patch in the middle of the back. Adult billbugs are black or dark gray beetles with a relatively large abdomen covered by hard wings which appear fused. Billbugs are about 1/4 inch long and have elongated snouts. Adults can be observed on warm sunny days in the spring, walking along pavement adjacent to bluegrass lawns.

Life cycle

Bluegrass billbugs overwinter as adults in the turf and in semi-protected areas. They emerge in the spring to lay eggs in the stems of the bluegrass. The eggs hatch in about two weeks and the larvae feed within the stem briefly before moving downward to feed on the crown. The larvae molt twice as they feed, ultimately ending up in the root zone feeding on roots and rhizomes. Larvae are most numerous (and nearing their maximum size) from mid July to mid August in the Northeast, and this is when damage usually becomes apparent. Larvae pupate in the soil in late summer and emerge as adults in September.

Control

Several insecticides are labelled for bluegrass billbug control. Some of these include diazinon (6 lb ai/A), Dursban (2 to 4 lb ai/A), Oftanol (1 to 2 lb ai/A), and Sevin (8 lb ai/A). As with most insect pests, applications must be made before damage becomes apparent. Bluegrass billbug damage becomes apparent in late summer when most individuals are about ready to pupate. Pupae are not sensitive to insecticides, so late summer applications are a waste of time and money. Bluegrass billbug control is best achieved if an insecticide is applied between mid May and early July, when large numbers of adults are observed on adjacent pavement (1 adult per minute average). Normally a single application is sufficient. For best results, turf should be mowed shortly before the application and the materials should be watered in lightly, just enough to move the material into the upper thatch.

SOD WEBWORMS

Identification

Sod webworms and cutworms are a complex species of insects which feed on turf. Sod webworm adults are small beige moths with a wingspan of 3/4 inch. These moths often are observed flying erratically, just above the lawn at dusk. The larvae are caterpillars which range in color from green to brown, depending on the species. Full grown larvae are 3/4 inch long, and often have distinctive dark spots scattered along the body. Caterpillars burrow through the thatch, and line their tunnels with webs of silk-like material. Feeding occurs only at night and may involve severing grass blades near the crown or chewing notches on the sides of the blades. If populations are high enough during hot or dry weather, turf plants can be killed.

Life cycle

Most sod webworm species overwinter as caterpillars coiled in silk cases covered with soil. The webworms pupate in the spring and adults emerge shortly to mate. Female moths drop eggs on the turf haphazardly as they fly at dusk. Caterpillars emerge from the eggs and begin feeding immediately. Development is directly related to temperature, but normally it takes six to eight weeks to complete a generation. Most sod webworm species complete two or three generations per year in the Northeast. Often there is considerable overlap in the field, so you might see adults, small caterpillars, and large caterpillars at the same time.

Control

Several insecticides are registered for use on sod webworms or their close relatives, cutworms. Some of these include Aspon (4 to 8 lb ai/A), diazinon (4 lb ai/A), Dursban (1 lb ai/A), Proxol or Dylox (8 lb ai/A), Oftanol (2 lb ai/A), and Sevin (8 lb ai/A). Since healthy turf usually can tolerate some sod webworms and outgrow the damage, insecticide applications normally are made on an "as needed" basis throughout the summer. Any cultural techniques which will encourage healthy turf (adequate water, proper fertilization, higher mowing heights) will lessen the impact of a sod webworm infestation. If chemical control is deemed necessary, it should be made in the evening, since webworms feed only at night. The turf should be watered briefly just before treating and watered again for about 15 minutes after treating. Use lower volumes of water when using liquid formulations, and avoid mowing the treated turf for one to three days after treating.

Note: Insecticides mentioned in this report were registered for suggested uses according to federal registration. However, these regulations and State laws vary, so it is the responsibility of the applicator to read the label and be sure that he is in compliance with any restrictions.

When trade names are used for identification, no product endorsement is implied nor is discrimination intended against similar materials. Lists of insecticides in this report were not exclusive. There are additional products available and labelled for the described purpose.