

LAWN INSECTS: HOW TO CONTROL THEM 2020

Frank A. Hale, Professor, Entomology and Plant Pathology

Karen M. Vail, Professor, Entomology and Plant Pathology

Originally Prepared by Science & Education Administration, United States Department of Agriculture



CONTENTS

PESTS THAT INFECT SOIL AND ROOTS	3	PESTS THAT INHABIT BUT DO NOT DAMAGE LAWNS	8
White Grubs	3	Earwigs	8
Ants	4	Ticks	8
Mole Crickets	5	Chiggers	8
Wireworm	5	Thrips	8
Cicada Killer Wasp	5	Slugs and Snails	8
Native Bees	5	Millipedes and Centipedes	8
Periodical Cicada	5	Sowbugs and Pillbugs	8
Billbugs	5	Spiders and Scorpions	8
Earthworms	6	Fleas	8
PESTS THAT FEED ON LEAVES AND STEMS	6	CONTROL	8
Sod Webworms	6	Use of Pesticides	9
Armyworms	6	Special Precautions	9
Cutworms	7	Sampling and Economic Thresholds for Turfgrass Insect Pests	9
Billbugs	7	REFERENCES	9
Grasshoppers	7	COMMON AND SCIENTIFIC NAMES	10
Frit Fly	7	COMMERCIAL TURFGRASS INSECT CONTROL CALENDAR	11
PESTS THAT SUCK PLANT JUICE	7	PESTICIDES	12
Chinch Bugs	7		
False Chinch Bug	7		
Leafhoppers	7		
Mites	7		
Spittlebugs	7		

Cover image by Alan Windham



JAPANESE BEETLES ON A ROSEBUSH

Many insects and insect-like pests damage lawns and other turf. They cause the grass to turn brown and die, or they build unsightly mounds. Some pests infest the soil and attack the plants' roots, some feed on the plants' leaves and stems, while others suck juice from the plants. Other insects and insect-like pests inhabit lawns, but do not damage them. The pests are annoying and some of them attack people.

These pests can be controlled with insecticides. The recommendations in this publication are applicable only to lawns.

PESTS THAT INFECT SOIL AND ROOTS

White Grubs

White grubs are the larvae of several species of scarab beetles. They are whitish or grayish, have brownish heads and brownish or blackish hind parts and are usually found in a curled position when disturbed. They hatch from eggs laid in the ground by the female beetles. In Tennessee, most species of white grubs spend about 10 months in the ground; some remain in the soil two years. In mild weather, they live 1 to 3 inches below the surface of the lawn; in winter, they go deeper into the soil.

They burrow around the roots of the grass, then feed on them about an inch below the surface of the soil. Moles, skunks and birds feed on the grubs and may tear up the sod in searching for them.

You can estimate the white grub population of your lawn. Do this from mid-July to early August or in the spring after the soil warms up and the grubs are near the surface. With a spade, cut three sides of a strip 1-foot square by 2 or 3 inches deep. Force the spade under the sod and lay it back, using the uncut side as a hinge. Use a trowel to dislodge soil on the overturned roots that might contain grubs. Count the white grubs in the exposed soil. Replace the strips of sod. In the same way, cut strips of sod in several other parts of the lawn, and count the white grubs under each strip. To calculate the average number of white grubs per square foot of lawn, divide the total number of white grubs counted by the number of strips. The average number of

white grubs per square foot is a measurement of white grub density. Economic thresholds based on grub density have been developed to assist in the decision-making process of whether to treat or not. A list of these economic thresholds is available in Extension publication **PB 1342, Commercial Turfgrass Insect Control**.

The adult beetles differ in appearance, distribution and habits. The following are important in lawns:

May Beetles — These beetles are brown or blackish-brown. More than 200 kinds are found in the United States. Sometimes they are called June beetles. The adults of the species emerge in the early spring. Most species begin emerging in late May or June and can be active through mid-summer. Eggs laid in July and early August soon hatch into larvae called white grubs. Some of them remain in the soil two years and may feed on the grass roots during a couple seasons.



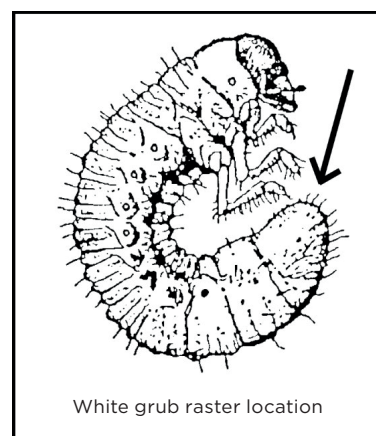
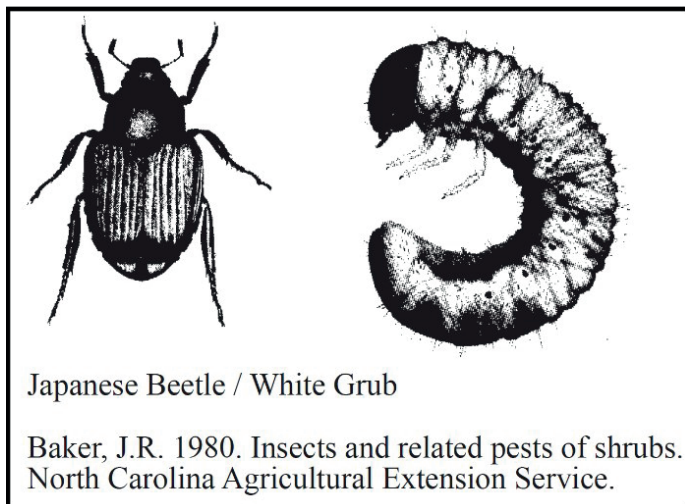
MAY BEETLE

Japanese Beetle — The beetle is about 1/2 inch long and has a shiny metallic-green body (see Extension publication **PB 946**). It has coppery-brown wing covers and six small patches of white hair along each side and the back of the body, just under the edges of the wings. The adult insect feeds on many different plants.

These insects are found mostly in the eastern



MAY BEETLE



states. The adult beetles begin to appear in early June and are active for four to six weeks. The young are sometimes called annual white grubs because the life cycle of the insect is completed in one year.

Asiatic Garden Beetle — The beetle is about 1/4 inch long, is chestnut brown and has a velvety appearance. The underside of the body is covered with short yellow hairs. The insect flies only at night and feeds on various kinds of foliage. They are most abundant from mid-July to mid-August. They complete their life cycle in one year.

Oriental Beetle — The beetle is about 5/8 inch long, is straw-colored and has some dark markings on the body. The beetles have been detected using traps in Knox and Davidson Counties in Tennessee. At present, the distribution of this pest in Tennessee is uncertain. They appear in late June and July. Grubs prefer unshaded lawn and short grass.

Masked Chafers — These beetles are 1/2 inch long and brown. They have a darker front part of the head that gives them their “masked” name. The adults live in the soil during the day and emerge at night; they are especially active on warm humid evenings.

The northern masked chafer is found from Connecticut south to Alabama and west to California. In Tennessee, the distribution of the northern masked chafer overlaps southern masked chafer, which is common in the Southeastern states. Masked chafers appear in late May, June and July and are active one or two months.

These annual white grubs have irregularly arranged spines on the underside of the last body segment (raster).

Rose Chafer — The beetle is 1/2 inch long and is yellowish brown; it has long spiny legs. Rose chafers feed on almost any vegetation and are very destructive to roses in bloom. They prefer areas in which the soil is light and sandy. They are abundant in June and early July. The grubs are not as harmful to lawns as some of those mentioned above.

Green June Beetle — The beetle is nearly 1 inch long. The body is nearly flattened; it is velvety-green and has bronze to yellow edges. The insects feed on ripening fruit and also on foliage of many trees and plants. The females often lay eggs in piles of grass clippings, mulched plant beds and in the soil. They are active in June, July and August. They produce one generation a year.

The grubs feed mainly on decaying vegetable matter. Their burrowing tends to disturb grass roots by separating them from the soil, causing the grass to dry out and die. The grubs can be especially damaging in newly sown lawns.

Damage is most severe in dry seasons and is most apparent in the fall.

Sometimes after a heavy rain or during warm nights with heavy dew, the grubs come out of the soil and crawl on the surface of the ground. They have the unusual habit of crawling on their backs.

Ants

Many ants are considered beneficial because they prey on pest insects, such as sod webworms, white grubs, cutworms, ticks, fleas, etc., and aerate the soil and recycle nutrients when building foraging tunnels and mounds (see Extension publication **PB 1629**). But some

ants are considered pests when they build unsightly nests in the ground or when they tend and protect pestiferous sucking insects, such as aphids, for their honeydew production. Fire ants (see fireants.utk.edu), field ants and Allegheny mound ants can build large mounds. Ants also destroy grass seeds in the ground and prevent good stands. Some ants bite or sting people and animals. Imported fire ants are especially vicious.

Mole Crickets

Mole crickets are light brown with a lower surface lighter than the upper and often tinged with green. They are about 1 1/2 inches long and have short, stout forelegs, shovel-like feet and large, beady eyes.

Mole crickets feed on the roots of the grass. In addition, their burrowing uproots seedlings and causes the soil to dry out quickly. The type of mole cricket found in Tennessee is called the northern mole cricket. It is not as damaging as some of the species found in coastal states. It can be a minor pest, especially in golf course greens.

Wireworm

Wireworms, which are the larvae of click beetles, are 1/2 to 1 1/2 inches long and are usually hard, dark brown, smooth and slender. Some wireworms are soft and white or yellowish. Wireworms bore into the underground part of the stems and feed on the roots of the grass. The boring causes the plant to wither and die.

The adults are about an inch long and brownish, grayish or nearly black. They are hard-shelled and their bodies taper somewhat at each end.

When they fall on their backs, the beetles flip the middle part of the body against the ground, throw themselves several inches into the air and make a clicking sound.

Cicada Killer Wasp

This insect is about 1 1/2 inches long and has yellow and black markings on its body (see Extension publication **SP 341-T**). The wasps dig deep nests or burrow in the ground and mound the soil at the entrance to the nests. The female paralyzes a dog-day cicada by stinging it, then places it in the nest and lays an egg on it. When the egg hatches, the larva feeds on and eventually kills the dog-day cicada.



CICADA KILLER WASP



PERIODICAL CICADA

These solitary wasps, which appear in late July and August, cause limited damage to lawns by their burrowing. While they fly around aggressively, they usually do not sting people unless they are provoked.

Native Bees

Some kinds of native bees occasionally damage lawns by digging up the soil, making holes and forming mounds. The amount of damage is usually of little consequence and these bees are pollinators and therefore considered beneficial. These solitary bees don't tend to sting. Thus, chemical control measures are not recommended, although watering the area once or twice a day may discourage the bees from nesting in the lawn.

Periodical Cicada

The young, or nymphs, leave many small holes in lawns, especially under trees, when they emerge to become adults. If you hear the day-long song of the cicada in the spring of a year in which a brood is scheduled to appear in your region, the holes in your lawn were probably made by the emerging nymphs. These holes are not harmful and can be filled in with soil or sand if desired.

If a large brood is emerging, protection of ornamental trees and shrubs in the lawn is recommended (see Extension publication **SP 341-F, Periodical Cicadas**).

Billbugs

Billbugs are a type of beetle with elongated, slender snouts or bills. At the tip are a pair of strong chewing mandibles. The adult is 5/16 inch long and its color is reddish brown to jet black. In the early spring, the adult billbug chews a hole in the stem of the grass and inserts an egg. The resulting white legless larva or grub hollows out the grass stem and fills it with fine, grit-like frass (insect excrement). When the larva is too big for the stem, it emerges and feeds on other plant tissue around the base of the plant.

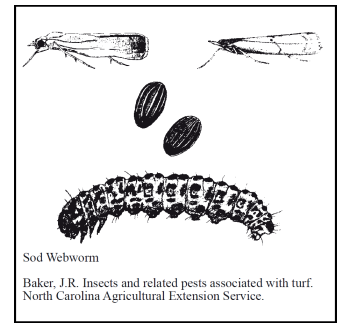
The fully grown legless larva is 1/4-3/8 inch long with a distinct brown head. The larva can chew roots, rhizomes and stolons into pieces, which causes sod to fall apart when lifted.



BILLBUG



BILLBUG LARVA



Sod Webworm
Baker, J.R. Insects and related pests associated with turf.
North Carolina Agricultural Extension Service.



SOD WEBWORM



SOD WEBWORM MOTH

Several species of billbugs damage lawns. The bluegrass billbug is a pest of Kentucky bluegrass, while the hunting billbug causes damage to zoysiagrass and bermudagrass.

Earthworms

When earthworms are numerous, they sometimes become pests in lawns. They make small mounds of castings that ruin the appearance of the grass. An imported species, the oriental earthworm is found in some of the eastern United States. It is 6 to 8 inches long and about 1/5 inch in diameter. It is light green on the upper surface and has a purplish-green line down the center of the back. It throws up abundant castings of soil.

PESTS THAT FEED ON LEAVES AND STEMS

Sod Webworms

Sod webworms are about 3/4 inch long and light brown. Their bodies are covered with fine hairs.

Sod webworms are the larvae of lawn moths. The adults are small, whitish or gray moths (or millers). They fold their wings closely about their bodies when at rest. They hide in the shrubbery or other sheltered spots during the day. In the early evening, they fly over the grass and the females scatter eggs over the lawns.

The worms are active only at night. They live in protective silken webs or nets that they form about their bodies. As soon as they are hatched, they start feeding on the grass leaves. When they grow larger, they build burrows or tunnels close to the surface of the soil; they reinforce the tunnels with bits of dirt and pieces of grass, then line them with silk and live in them. They cut off blades of grass and eat them. Some species feed on the grass crowns at ground level and on the roots. As partly grown larvae, they overwinter in their silken webs.

Sod webworms prefer new lawns. They attack bentgrass, bluegrass, fescue and other grass. Irregular brown spots are the first signs of damage. Fortunately, significant turf damage rarely occurs.

Several species infest lawns. The dirty white sod webworm larvae live in silk-lined tubes about 3/8 inch in diameter that extend 2 to 3 inches into the soil.

You can find sod webworms, other caterpillar pests and billbug adults by pouring a soap solution of two teaspoons of mild liquid dishwashing detergent in a gallon of water over a 4-foot-square area. If there are four to six or more of them, apply an insecticide.

Armyworms

Armyworms and fall armyworms are the larvae (caterpillars) of moths. When they are numerous, they may devour the grass down to the ground. Their feeding causes circular bare areas in lawns or in heavy infestations whole lawns may be devoured.

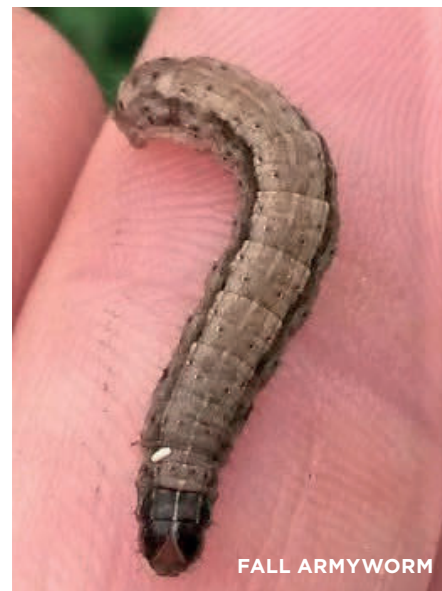
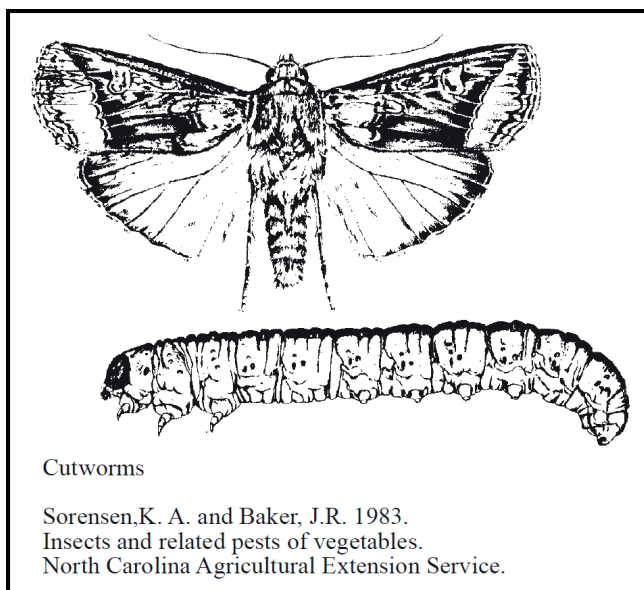
These larvae are 1 1/2 inches long; they are greenish to brown with alternating dark and light stripes. The best diagnostic features of the fall armyworm are its darker head with contrasting white to yellow inverted "Y" lines on the front of the head and four distinctive black dots on the top of each abdominal segment.

The adults of the armyworm are tan with bronze front wings with a single white dot in the middle. Their wings measure about 1 1/2 inches across when expanded.

Cutworms

Cutworms are dull-brown, gray or nearly black caterpillars and are 1 1/2 to 2 inches long. Some cutworms are spotted, others are striped. Usually they hide in the soil during the day and feed at night. They are the larvae of night-flying brown or grayish moths.

Cutworms infest lawns occasionally. They feed on the leaves or cut off the grass near the soil and may do severe damage to seedlings of bermudagrass, bentgrass and ryegrass. Sample for cutworms by pouring a soap solution of 2 teaspoons of liquid dishwashing detergent in a gallon of water over a 4-foot-square area. If one or more cutworms are detected, apply an insecticide.



Billbugs

Billbugs feed on stems and grass leaves. For a description of the insects, see billbugs in the previous section.

Grasshoppers

Grasshoppers do not feed on the grasses of a well-kept lawn except when they are very numerous and forage is scarce. They usually migrate to lawns from croplands or wastelands. Control measures in lawns are seldom necessary. See Extension publication **SP 290-X**.

Frit Fly

This insect pest from Europe is widely distributed across the country. It occasionally attacks bluegrass lawns, bentgrass golf greens and some other grasses. The adult fly is black and about 1/16 inch long. The female lays eggs on the grass and the hatching maggots bore into the stems.

PESTS THAT SUCK PLANT JUICE

Chinch Bugs

The immature nymphs of the common chinch bug and the southern chinch bug cause most of the damage by feeding with their piercing-sucking mouthparts. Yellowish spots appear in the infested lawn; they turn rapidly into brown, dead areas. Nymphs hatch from eggs laid by the female adults. A first instar nymph (first-stage nymph) is about half the size of a pinhead. The first instar of the southern chinch bug is bright red and has a white band across the back. As it grows, it molts (sheds its skin) four times. The full-grown nymph is black and has a white spot on the back between the wing pads. The adults are about 1/6 inch long.

The adults overwinter in thatch or leaf litter and lay eggs in the leaf sheaths or on the roots in the early spring. The eggs hatch in the spring and nymphs infest lawns until late fall.

False Chinch Bug

The false chinch bug is frequently mistaken for a chinch bug. It feeds on grasses in the same way as the chinch bug, but rarely is a lawn pest. The nymphs are greenish-gray; the adults are gray.

Leafhoppers

Leafhoppers are tiny triangular or wedge-shaped insects that fly or hop short distances. They are less than 1/5 inch long and are green, yellow or brownish gray.

Many species of leafhoppers infest lawns. They suck the sap from the leaves and stems of the grass. New lawns may be damaged so extensively that reseeding is necessary. Damage to established lawns is evident in whitened patches. It is often mistaken for damage due to dry weather or disease.

Mites

Several species of mites attack grasses. They suck the sap and cause the leaves to be blotched and stippled. Severe infestations can kill the plants.

The Banks grass mite occurs throughout most of the United States and occasionally attacks lawns. It is not ordinarily a pest in well-managed lawns.

Clover mites feed on clover and other lawn plants. They are very tiny and brown. Although they feed only on plants, they are a nuisance when they enter homes. This usually occurs in spring and fall.

Spittlebugs

Spittlebugs seldom damage well-managed lawns. The nymphs live inside masses of spittle and suck the juices from the plants. The adults

resemble leafhoppers in appearance and habits, but they are more robust. Two species are sometimes found in lawns.

The meadow spittlebug is found in Tennessee. The nymphs are yellowish green. The adults are about 1/4 inch long, are gray or brown and have dark brown markings. They usually feed on clover or weeds.

The twolined spittlebug occasionally infests lawns in Tennessee. The nymph is ivory and its head and thorax are brownish. The adult is about 3/8 inch long, is dark brown or black, and has two orange stripes on its wings. These insects feed on bermudagrass, St. Augustinegrass, centipedegrass and several other plants. Thatch control is important in preventing and controlling spittlebugs in lawns. Proper dethatching and fertilization practices can disrupt the humid conditions essential for spittlebug development. Chemical control measures in lawns are seldom necessary.

PESTS THAT INHABIT BUT DO NOT DAMAGE LAWNS

Earwigs

Earwigs are beetle-like insects. They are about 3/4 inch long and are reddish-brown. The insect has a prominent pair of forcep-like cerci at the rear of the body. The cerci of the male are curved. Earwigs hide during the day and forage at night.

These insects are found occasionally in lawns. Sometimes they breed in enormous numbers in piles of lawn clippings. They feed on all kinds of food.

Ticks

Several kinds of ticks infest lawns (see Extension publication **PB 726**). They drop on the grass from dogs, rodents and other animals. Most of them attack people. Pain may result from their bites. Some ticks transmit diseases, including Rocky Mountain spotted fever, human monocytic ehrlichiosis, Lyme disease and tularemia.

Chiggers

Chiggers, or “red bugs,” invade lawns from surrounding grassy or woody areas. These mites are annoying to people. They attach themselves temporarily to the skin and release a poison that causes severe irritation and intense itching. They are very tiny and are seldom seen.

Thrips

Thrips are found in lawns and sometimes in homes. They come from nearby grass or flowers. These tiny black or brown insects may inflict painful bites on people working about the lawn. Control measures in lawns are seldom practical.

Slugs and Snails

Slugs and snails may often move about on the lawn and may injure adjacent plants. They are night feeders and leave mucous trails on plants and sidewalks.

Millipedes and Centipedes

Millipedes (two pairs of legs per body segment) and centipedes (one pair of legs per body segment) are dark brown and have many segments. Most of them coil up when disturbed.

Millipedes and centipedes do not usually damage lawns. Occasionally, millipedes congregate in yards after heavy rains (see Extension publication **W 357**). Their food is chiefly decaying vegetable matter.

Some of the larger centipedes may bite people. Most species are not dangerous. Control of centipedes in lawns is seldom necessary.

Sowbugs and Pillbugs

Sowbugs and pillbugs are light gray to slate-colored; they are 1/2 inch long; they have segmented bodies and seven pairs of legs. When disturbed, pillbugs roll up into tiny balls.

Sowbugs and pillbugs are usually found on damp ground under stones, boards, dead leaves or in damp basements. They feed on organic matter in the soil and sometimes on grass and other plants.

Control measures in lawns are seldom necessary; if they should be needed, apply one of the insecticides recommended for control of grubs.

SPIDERS AND SCORPIONS

Spiders are found about the lawn and on flowers, plants and shrubbery. Most spiders are harmless to people and are even beneficial because they capture and devour large numbers of harmful insects. They do not damage the grass or other vegetation. Two poisonous spiders found in Tennessee are the black widow spider (see Extension publication **PB 1193**) and the brown recluse spider (see Extension publication **PB 1191**). Consult a physician at once if bitten by either of these spiders.

Scorpions appear occasionally on lawns and about the yard. There are two species of scorpions in Tennessee. Their sting is similar in intensity to that of a bee or wasp. Control measures in lawns are seldom necessary for scorpions.

FLEAS

Fleas occasionally spread to lawns from infested dogs, cats or nearby animal quarters (see Extension publication **PB 1596**). They may attack people or pets.

CONTROL

The user is cautioned to read and follow all directions and precautions given on the label of the pesticide formulation that will be used.

Insecticides are sold under various trade names by garden supply houses and hardware, seed and drug stores.

Granules are ready-made formulations that are used dry. Apply them with lawn fertilizer spreader.

Wettable powders and other formulations are used in sprays. Mix the purchased product with water and apply with a garden type compressed air sprayer or a knapsack sprayer. The quantity of water to use depends on the type of sprayer you have. If a wettable powder is used, agitation of the mixture is necessary.

A quart jar attachment for a garden hose will provide good distribution of an insecticide on a lawn. Use an attachment that delivers a coarse spray and large volume of water. Usually a quart jar full of an insecticide mixture will cover about 500 square feet of lawn. Baits are usually purchased ready mixed.

Control of soil insects is sometimes difficult. Therefore, it is important to apply the pesticide at the time of the year when the insect is most susceptible to control. This information will be on the pesticide label. To control underground lawn pests, apply an insecticide and, immediately afterward, water the lawn according to label. To control aboveground lawn pests, apply an insecticide to the grass. Follow label directions on whether to irrigate or not after application.

Use of Pesticides

Pesticide use is governed by a federal law that is administered by the U.S. Environmental Protection Agency. This law requires manufacturers to register pesticides and makes it illegal for people to use them except in accordance with the instructions on the label.

You may, if you wish, use less of any pesticide than the maximum amount the instructions permit. However, always remember: (1) Be sure the pesticide comes in contact ONLY with plants or areas you intend to spray, and (2) Be sure to spray the pesticides uniformly. You can always get reliable, free information about any pesticide by calling your county Extension office.

Special Precautions

Store pesticides in original containers, out of reach of children and pests, and away from foodstuff. Apply pesticides selectively and carefully. Do not apply a pesticide when there is danger of drift to other areas. Avoid prolonged inhalation of a pesticide spray or dust. When applying a pesticide, it is advisable that you be fully clothed and use all the personal protection equipment stated on the label.

Do not apply insecticides to a lawn when people or animals are on it. Follow label directions and observe the re-entry interval before allowing people or pets on to the lawn. After handling a pesticide, do not eat, drink or smoke until you have washed. If a pesticide is swallowed or gets in your eyes, follow the first aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

When the pesticide container is empty, triple rinse the container and dispose of the container according to the "Storage and Disposal" statement on the pesticide label.

It is difficult to remove all traces of a herbicide (weed killer) from equipment. Therefore, to prevent injury to desirable plants, do not use the same equipment for insecticides and fungicides that you use for a herbicide.

Remove thatch prior to treatment to reduce pest harborage sites and to allow insecticide and water to reach the soil.

npic.orst.edu/health/disposal.html
epa.gov/safepestcontrol/safe-disposal-pesticides

Sampling and Economic Thresholds for Turfgrass Insect Pests

White grubs — Sample several square-foot sections of turf by using a shovel or spade to cut out a square-foot section and lift the turf back to count grubs. Treatment should be made if white grubs have reached the economic threshold. See Extension publication **PB 1342** for treatment times.

Threshold Targets for White Grubs

Assuming Adequate Growing Conditions and No Digging Animals

- Annual White Grubs 5-10 grubs per square foot (Japanese beetle, Oriental beetle, European chafer, Asiatic garden beetle)
- Masked Chafer (Annual White Grub) 15-20 grubs/square foot
- Black Turfgrass Ataenius 30-50 grubs/square foot
- May/June Beetles: 3-8 grubs per square foot
- Green June Beetle Grubs: 6-8 grubs per square foot

Adapted from D.J. Shetlar (1995) and D.A. Potter (1982) in Hale (2012) Commercial Turfgrass Insect Control (see Extension publication **PB 1342**).

Sod webworms — These caterpillars feed on the blades of grass. The light-colored caterpillars with dark spots make silk tunnels in the grass.

Check for sod webworms and cutworms by preparing a soap solution of 2 teaspoons of liquid dishwashing detergent in a gallon of water. Pour this solution over a 2-foot-by-2-foot (4 square feet) area. Treat when four to six or more sod webworms per 4 square feet are found.

Cutworms — These dark, dingy-colored caterpillars feed at night and hide in the ground in the daylight. They clip off the blades of grass at the crown. Treat when one or more cutworms per 4 square feet are found.

REFERENCES

- Potter, D.A. 1982. Influence of feeding by grubs of the southern masked chafer on quality and yield of Kentucky bluegrass. *J. Econ. Entomol.* 75: 21-24.
- Shetlar, D.J. 1995. Lawns and Turf/North. pp. 316-317. In R. Foster, E. Knake, R.H. McCarty, & J.J. Mortvedt [eds.], 1995 Insect Control Guide. Meister Publishing Co., Willoughby, Ohio.

COMMON AND SCIENTIFIC NAMES

Ants	Formicidae (many species)
Armyworms	Noctuidae (several species)
Asiatic garden beetle	<i>Maladera castanea</i> (Arrow)
Banks grass mite	<i>Oligonychus pratensis</i> (Banks)
Bees	Hymenoptera (several species)
Bermudagrass mite	<i>Eriophyes cynodoniensis</i> (Sayed)
Billbugs	<i>Sphenophorus</i> spp.
Centipedes	Chilopoda
Chiggers	<i>Trombicula</i> spp.
Cicada killer	<i>Sphecius speciosus</i> (Drury)
Clover mite	<i>Bryobia praetiosa</i> Koch
Common Chinch Bug	<i>Blissus leucopterus leucopterus</i> (Say)
Cutworms	Noctuidae (Several species)
Earthworms	Annelida
Earwigs	Dermaptera
False chinch bug	<i>Nysius raphanus</i> Howard
Fleas	Siphonaptera (several species)
Frit fly	<i>Oscinella frit</i> (Linnaeus)
Grasshoppers	Orthoptera (Many species)
Green June beetle	<i>Cotinis nitida</i> (Linnaeus)
Hunting billbug	<i>Sphenophorus venatus vestitus</i> Chittenden
Japanese beetle	<i>Popillia japonica</i> Newman
Lawn armyworm	<i>Spodoptera mauritia</i> (Boisduval)
Leafhoppers	Cicadellidae (several species)
May beetles	<i>Phyllophaga</i> spp.
Meadow spittlebug	<i>Philaenus spumarius</i> (Linnaeus)
Millipedes	Diplopoda
Northern masked chafer	<i>Cyclocephala borealis</i> Arrow
Northern mole cricket	<i>Neocurtilla hexadactyla</i> (Perty)
Oriental beetle	<i>Anomala orientalis</i> (Waterhouse)
Periodical cicada	<i>Magicicada</i> spp.
Rose chafer	<i>Macrodactylus subspinosus</i> (Fabricius)
Scorpions	Scorpionida
Slugs and snails	Gastropoda
Sod webworms	Crambidae
Southern chinch bug	<i>Blissus insularis</i> Barber
Southern masked chafer	<i>Cyclocephala lurida</i> Bland
Sowbugs and pillbugs	Crustacea
Spiders	Araneida
Thrips	Thysanoptera (several species)
Ticks	Acarina
Twolined spittlebug	<i>Prosapia bicincta</i> (Say)
Wireworms	Elateridae (several species)

COMMERCIAL TURFGRASS INSECT CONTROL CALENDAR

PESTS	+	++	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ants	II	a							S, G or B					
Armyworms, Cutworms	III	a							S or G					
Yellowjackets	III	a							S					
Bees and Wasps	II	a							S or G					
Billbugs	III	d,e,f							S or G					
Chinch Bugs	III	b							S or G					
White Grubs	I	a					S or G			S or G				
Green June Beetles	I	a					S or G			S or G				
Leafhoppers, Spittlebugs	II	a							S					
Mole Crickets	III	g					S, G or B				B			
Sod Webworms	I	c,d,e,g							S or G					

+ Degree of importance of pest:

- I - Important pest, frequent occurrence
- II - Usually present but generally not a pest
- III - An occasional pest

S - Sprays

G - Granules

B - Baits

++ Preferred grass species:

- a - Fescue and many other grasses
- b - St. Augustine
- c - Fescue
- d - Bluegrass
- e - Bermudagrass
- f - Zoysiagrass
- g - Bentgrass

Pesticides labeled for common lawn insect and arthropod pests. Pest management professionals should refer to **PB 1342** for products available for commercial turfgrass.

PEST	INSECTICIDE	AMOUNT/1,000 SQ. FT. (or as noted)	REMARKS, PRECAUTIONS
IMPORTED FIRE ANTS around residences, try Program 1, the two-step method: Broadcast one of the baits first. IGR baits are distributed well because they don't affect the worker. 2. 7-10 days later, apply a drench, dust, fast-acting bait (hydramethylnon, indoxacarb, abamectin, or spinosad), or granules to the individual mounds that are likely to be encountered by people. See fireant.utk.edu for more fire ant control strategies. Contact your local county Extension agent or TDA if fire ants are located in regions of the state where they have not been seen before. Fire ants are in all (A) or part (P) of 66 counties as of April 24, 2020: Anderson (A), Bedford (A), Benton (A), Bledsoe (A), Blount (A), Bradley (A), Cannon (A), Carroll (A), Chester (A), Cocke (A), Coffee (A), Crockett (A), Cumberland (A), Davidson (P), Decatur (A), DeKalb (A), Dickson (P), Fayette (A), Franklin (A), Gibson (P), Giles (A), Grundy(A), Hamblen (A), Hamilton (A), Hardeman (A), Hardin (A), Haywood (A), Henderson (A), Hickman (A), Houston (A), Humphreys (A), Jefferson (A), Knox (A), Lauderdale (P), Lawrence (A), Lewis (A), Lincoln (A), Loudon (A), Madison (A), Marion (A), Marshall (A), Maury (A), McMinn (A), McNairy (A), Meigs (A), Monroe (A), Moore (A), Morgan (P), Perry (A), Polk (A), Rhea (A), Roane (A), Rutherford (A), Sequatchie (A), Sevier (A), Shelby (A), Stewart (P), Tipton (A), Trousdale (P), Union (P), Van Buren (A), Warren (A), Wayne (A), White (A), Williamson (A), Wilson (A). Changes are in bold. The IFA quarantine is expected to change in the future. For updates, see TDA's website at: tn.gov/agriculture/businesses/plants/plant-pests--diseases-and-quarantines/ifa.html	BAITS Extinguish bait (IGR) 0.5% methoprene	broadcast 1-1.5 lb/acre or 3-5 Tbsp. around the mound (& labeled for pasture, cropland)	Most available fire ant baits use soybean oil as a feeding attractant. Baits that are old (over 2 years old in an air-tight container), left in unsealed bags, or stored at high temperatures may become rancid and will not be fed upon by foraging workers. Keep baits dry. Wet baits are not attractive to fire ants. Apply baits when the grass and ground are dry or drying, and rain is not expected, preferably for the next 24 hours. Apply baits when fire ants are actively foraging. Foraging activity can be determined by spreading bait in a small pile in the area to be treated. If fire ants are actively foraging, you should see ants removing the bait within 10 to 30 minutes. This also will indicate that the bait is attractive and not too old. Fire ants generally will forage when air temperatures are between 70 and 90 F. During hot, summer weather, apply baits in the late afternoon or evening because fire ants will forage at night under these conditions. Broadcast the bait, or apply it as directed 2-4 ft. around, NOT ON, the mound. Avoid disturbing the ants right before applying the bait. Do not contaminate baits with fertilizer or other pesticides.
	Distance bait (IGR) 0.5% 2-[1-Methyl-2(4-phenoxyphenoxy) ethoxy]pyridine	broadcast 1-1.5 lb/acre or 1-4 Tbsp. around the mound	
	Award II 0.011% abamectin For use by professionals	broadcast 1 lb/acre, limited to 4 lb per acre per yr. or for 12 or less mounds per acre 5-7 Tbsp. around the mound.	
	PT Ascend Fire Ant Bait Formula 1 0.011% abamectin	broadcast 0.4 oz/1,000 sq. ft. or 5-7 Tbsp. around the mound	
	Spectracide® One-Shot Fire Ant Killer 0.016% indoxacarb	broadcast 0.5 lb/1,000 sq. ft. or 4 Tbsp. around the mound	
	Advion Fire Ant Bait 0.045% indoxacarb	broadcast 1.5 lb/acre or 0.5 oz/1,000 sq. ft. or 4 Tbsp. around the mound; up to 4 app/yr.	
	Amdro Fire Ant Bait 0.73% hydramethylnon Other hydramethylnon fire ant baits include AmdroPro, etc.	broadcast 1-2 lb/acre or 2- 5 level Tbsp. around the mound See labels for other hydramethylnon baits.	
	Siesta Fire Ant Bait 0.063% metaflumizone	apply 1.5 pounds per acre. If needed, re-treat after 4 to 8 weeks. DO NOT exceed 6.0 lbs./A total or 4 apps. per year.	
	Extinguish Plus (IGR & Other) 0.37% hydramethylnon 0.25% s-methoprene	broadcast 1-1.5 lb/acre or 2-5 Tbsp. around the mound (& labeled for pasture)	
	Spinosad baits, such as Ferti-Lome Come and Get it! Fire ant Killer and Southern Ag Payback Fire Ant Bait. Spinosyns are produced by a soil microorganism (<i>Saccharopolyspora spinosa</i>)	See label. Usually 4 Tbsp. around the mound	

PEST	INSECTICIDE	AMOUNT/1,000 SQ. FT. (or as noted)	REMARKS, PRECAUTIONS
IMPORTED FIRE ANTS CONT'D Program 2. Small areas where less than 20-30 mounds per acre. Apply individual mound (drench, dust or granular) treatments as needed. Program 3. Ant Elimination Method. 1. Broadcast a bait (optional) 2. Broadcast a contact insecticide (granule) to lawn when fire ant activity noted			For a list of many drench, dust or granular products available to treat fire ants see W 652 Fire Ant Products for the General Public Sorted by Formulation, Product Name and Use Site and W 649 Fire Ant Products for Tennessee's Schools By Formulation, Active Ingredient, Application Method and Use Site
ARMYWORMS AND CUTWORMS	Grub Ex1 chlorantraniliprole 0.08%	See label	Apply spring to late summer to dry lawn with a spreader and lightly water to activate. See label at scotts.com
	BioAdvanced Complete Insect Killer for Soil and Turf ready-to-spray imidacloprid 0.72% β-cyfluthrin 0.36%	dilutes automatically, see label	See label at bioadvanced.com Imidacloprid for early instar white grubs and β-cyfluthrin for above ground pests such as armyworms, cutworms, sod webworms, etc.
	BioAdvanced Complete Insect Killer for Soil and Turf ready-to-spread granules imidacloprid 0.15% β-cyfluthrin 0.05%	2 to 3 lbs.	
	BioAdvanced Complete Insect Killer for Soil and Turf ready-to-spread granules 1 Bifenthrin 0.058% Carbaryl 2.3%	2.25 lbs.	See label at bioadvanced.com
	BioAdvanced Vegetable & Garden Insect Spray Concentrate cyfluthrin 0.75%	3 fl. oz./gallon per 500 sq. ft.	See label at bioadvanced.com
	Spectracide Triazide Insect Killer for Lawns & Landscapes Conc. gamma-cyhalothrin 0.08%	see label	See label at spectracide.com/Products/Insect-Killers.aspx
	Monterey Garden Insect Spray spinosad 0.5%	2 oz. per gallon	For armyworms only Mix and apply a minimum of 3 gal. of spray per 1,000 sq. ft. Delay watering or mowing for 24 hr. after application. For best results apply in early morning or late afternoon. See label at montereylawngarden.com
	<i>Steinernema</i> sp. Entomopathogenic nematodes	See label	

PEST	INSECTICIDE	AMOUNT/1,000 SQ. FT. (or as noted)	REMARKS, PRECAUTIONS
BEEES, WASPS, CICADA KILLERS, YELLOWJACKETS See SP 341-M	Bee/Wasp Killer Aerosols Apicide carbaryl 5%D		Apply spray directly into nest entrance at dusk when wasps are less active. Repeat at 2-3 day intervals if activity in nest continues. See label at mysticchemical.com/wp-content/uploads/2014/04/Apicide-Dispenserlabel2010.pdf
WHITE GRUBS of MAY BEETLES, CHAFERS, JAPANESE BEETLE, GREEN JUNE BEETLES, ETC.	Bonide Insect & Grub Control Imidacloprid 0.5% lambda-cyhalothrin 0.1%	1.2 to 1.8 lbs.	Immediately water grass thoroughly after application. Apply once, anytime from mid- June through mid-July. See directions for further instructions. bonide.com/assets/Products/Labels/I60360.pdf
	BioAdvanced Complete Insect Killer for Soil and Turf ready-to-spray i imidacloprid 0.72% β-cyfluthrin 0.36%	dilutes automatically, see label	See label at bioadvanced.com For grubs, May through July. Water product in soon after application.
	GrubEx1 chlorantraniliprole 0.08%	See label	Apply spring to late summer to dry lawn with a spreader and lightly water to activate. scotts.com
	BioAdvanced 24-Hour Grub Killer Plus 1 Ready-to-Spread Granules trichlorfon 9.3% G	2 lbs.	Apply when grubs or damage first appears. The best time to kill grubs is July through September, when they are young and actively feeding near the soil surface. Water thoroughly within 24 hours after applying. Do not mow until the granules are watered in and the grass has dried. Do not apply this product to waterlogged areas, as this may decrease the product's effectiveness. See label at bioadvanced.com
MILLIPEDES, SOWBUGS, PILLBUGS	Hi-Yield Bug Blaster II Turf Insect Control Granules bifenthrin 0.2% G	2.3 lb for millipedes 4.6 lb for sowbugs and pillbugs.	fertilome.com/ProductFiles/33326%20Bug%20Blaster%20Approved%207-6-12.pdf
	BioAdvanced Complete Insect Killer for Soil and Turf ready-to-spread granules 1 Bifenthrin 0.058% Carbaryl 2.3%	2.25 lbs. for lawn areas, 2 – 4 lbs. for the 6 ft around a house	See label at bioadvanced.com

PEST	INSECTICIDE	AMOUNT/1,000 SQ. FT. (or as noted)	REMARKS, PRECAUTIONS
SOD WEBWORMS	Bayer Advanced Complete Insect Killer for Soil and Turf ready-to-spray imidacloprid 0.72% β-cyfluthrin 0.36%	dilutes automatically, see label	See label at bioadvanced.com Imidacloprid should control early instar white grubs and β-cyfluthrin should control above ground pests such as armyworms, cutworms, sod webworms, etc.
	Bayer Advanced Complete Insect Killer for Soil and Turf ready-to-spread granules imidacloprid 0.15% β-cyfluthrin 0.05%	2 to 3 lbs.	See label at bioadvanced.com Imidacloprid should control early instar white grubs and β-cyfluthrin should control above ground pests such as armyworms, cutworms, sod webworms, etc.
	Spectracide Triazide Insect Killer for Lawns and Landscapes Concentrate gamma-cyhalothrin 0.08%	Mix 1.5 fl oz (3 Tbsp) in 1 gallon of water to cover 240 sq ft.	Delay additional watering or mowing for 24 hours after application for optimum control of surface insects. spectracide.com/Products/Insect-Killers.aspx
	Monterey Garden Insect Spray spinosad 0.5%	2 oz. per gallon	Mix and apply a minimum of 3 gal. of spray per 1,000 sq. ft. Delay watering or mowing for 24 hr. after application. montereylawngarden.com/labels-sds-and-omri_insecticides
	GrubEx1 chlorantraniliprole 0.08%	See label	Apply spring to late summer to dry lawn with a spreader and lightly water to activate. See label at scotts.com
	Bayer Advanced 24-Hour Grub Killer Plus 1 Ready-to-Spread Granules trichlorfon 9.3% G	1.33 lbs.	See label at bioadvanced.com

Photos in this publication provided by:

IMAGE	PHOTOGRAPHER	PAGE
Japanese Beetles on rosebush	Alan Windham, <i>University of Tennessee Institute of Agriculture</i>	3
May Beetle (larva)	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	3
May Beetle	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	3
Japanese Beetle/White Grub	J.R. Baker, <i>North Carolina Agricultural Extension Service</i>	4
Japanese Beetle larva	Phil Nixon, <i>University of Illinois</i>	4
Green June Beetle larva	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	4
Green June Beetle raster	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	4
Periodical Cicada	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	5
Cicada Killer Wasp	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	5
Hunting Billbug	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	6
Billbug Larva	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	6
Sod Webworm	J.R. Baker, <i>North Carolina Agricultural Extension Service</i>	6
Sod Webworm	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	6
Sod Webworm Moth	Frank A. Hale, <i>University of Tennessee Institute of Agriculture</i>	6
Cutworms	K.A. Sorenson and J.R. Baker, <i>North Carolina Agricultural Extension Service</i>	7
Fall Armyworm	David Cook, <i>University of Tennessee Extension</i>	7

PRECAUTIONARY STATEMENT

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store, or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label and registered for use in your state.

DISCLAIMER STATEMENT

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label takes precedence over the recommendations found in this publication. Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others which may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

The author(s), the University of Tennessee, the Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.



UTIA.TENNESSEE.EDU

Real. Life. Solutions.™