

Controlling Insect Pests During Stand Establishment of Forage Legumes

Forage legumes such as clover and alfalfa are components of many forage programs in Alabama. Insects can interfere with the successful establishment of a forage legume stand by scavenging seeds before they have germinated, by feeding on newly emerging roots and shoots, and by disrupting root-soil contact.

There are several insect pests that interfere with seedling establishment of forage legumes in the fall, including crickets, grubworms, and several species of defoliating caterpillars and weevils. Alfalfa weevil, clover leaf weevil, and lesser clover leaf weevil typically feed on mature legume plants but may also affect the stand long term by weakening young plants in early spring. Clover head weevils and clover seed weevils feed on clover flower heads and therefore affect natural reseeding. The following sections provide descriptions of each of these pests as well as suggestions for controlling them.

Striped ground crickets

(*Allonemobius fasciatus*). Striped ground crickets (Figure 1) feed preferentially on legume seedlings. These crickets are small—about half the size of the more familiar black crickets. The striped ground cricket is light brown and has three dark stripes down its back. Its hind legs have long spurs in contrast to shorter spurs on the legs of the black cricket. Striped ground crickets can be found throughout Alabama.

Relatively little is known about the biology of this pest, but it is especially abundant in late summer and fall. The insect damages plants by eating the



Figure 1. Common crickets found in Alabama forages. Striped ground cricket—left; black field cricket—right

leaves of newly emerged clover seedlings and leaving only the stem, which results in the death of the seedlings. On older seedlings, the crickets remove semicircular areas from the leaves, which may be enough to kill the seedling, depending on other stresses that may exist.

Striped ground crickets live in perennial grass sod. In the absence of clover, the insect feeds on dead plant material and other dead insects. If more than four striped ground crickets are found per square foot, it is recommended that they be controlled before clovers are overseeded (Table 1).

The striped ground cricket is rather inconspicuous. Other insects are sometimes blamed for damage it has done. Black field crickets are often blamed but are seldom a concern in legume plantings because they feed almost exclu-

sively on dead plant materials and dead insects. Grasshoppers, which feed on grasses as well as legumes, are potential pests of seedling forage crops but are less of a threat to young legumes than striped ground crickets.

One way to avoid striped ground cricket damage is to delay planting until after a hard freeze. However, the later clover is planted, the more vulnerable it will be to severe weather and the later the forage will be available for grazing. The following planting dates are recommended for overseeding clover on warm-season forage grasses (usually annual clover in this situation): October 1-15 in northern Alabama, October 15-30 in central Alabama, and November 1-15 in southern Alabama. In some years, a hard freeze eliminates this pest before clover seedlings emerge in warm-season grass sods. Clovers planted in late winter

Table 1. Suggested Insecticides for Control of Striped Ground Cricket, Clover Head Weevil, and Clover Seed Weevil

Common name	Active ingredient per acre (lb)	Trade name	Rate of formulated product per acre	Grazing or preharvest interval (days)	Approved crop uses
carbaryl	1 to 1.5	Sevin XLR or Sevin 4F	1 to 1.5 qt	7 to 14 ¹	clover, alfalfa, perennial grass sod
	1 to 1.5	Sevin 80S or Sevin 80WSP	1.2 to 1.9 lb	7 to 14 ¹	
methyl parathion*	0.75	Cheminova Methyl 4EC	1.5 pt	15	alfalfa, perennial grass sod

¹14 days if applied to perennial grass sod, 7 days for clover and alfalfa

* Restricted-use pesticide

may avoid damage by striped ground crickets but are vulnerable to a spring drought.

Striped ground crickets are even more of a problem when clover, usually red or white clover, is planted into a cool-season grass sod such as tall fescue. This is because most autumn plantings of these clovers are made in September or October, well before a hard freeze has occurred.

Grubworms (*Cotinis nitida*).

Grubworms are the immature feeding stage, or larvae, of green June beetles (junebugs). Grubworms, like other white grubs, have a brown head and a cream-colored body. The fact that they crawl around on their backs distinguishes them from most other white grub species.

Grubworms are very injurious to fall-planted forage seedlings, but not because they feed on them. Grubworms feed on decaying organic matter and injure forage seedlings as they tunnel in the leaf litter and top 2 inches of soil in search of food. As the grubworms move around, they can uproot young seedlings or kill the plant by mechanically pruning its roots.

Green June beetles have one generation per year. As their name implies, adults emerge from the soil in late June and July. The adults mate, and then the females dig a tunnel into the soil and lay egg clusters of 10 to 30 eggs. Eggs begin to hatch in late July and August,

and the young grubworms feed extensively until late fall. Grubworms are about 1 ½ inches long when fully grown and are as big around as a piece of blackboard chalk. Green June beetle females prefer to deposit their eggs in areas where there is a lot of organic matter. For this reason, fields where manure or broiler litter has been applied as an organic fertilizer are at greatest risk for infestation by grubworms. Bermudagrass hayfields with and excessive amount of thatch are also prone to damage. Highest populations seem to occur in areas with sandy soils, although economically important infestations of this pest have been found in all soil types.

To avoid grubworm damage, scouting should be done about a week before planting, particularly in fields at high risk for infestation. Look for small tunnel openings and pulverized soil. Dig in at least six of these areas, removing about 1 square foot of surface area and down to about 8 inches. Sift through the soil, and look for the insects. If more

than one grubworms per square foot is found, it is recommended that they be controlled before the clover is planted (Table 2).

Mix a recommended insecticide in at least 30 gallons of water. Graze or mow shortly before treatment because it is essential that the insecticide reach the ground. Treat late in the day since grubworms are most active at night. More information on this pest can be found in Extension publication ANR-991, "Biology and Control of the Green June Beetle."

Defoliating caterpillars

(*Spodoptera* spp., *Helicoverpa zea*).

Defoliating caterpillars such as fall armyworm, beet armyworm, yellow-striped armyworm, and corn earworm/tobacco bollworm can feed on young forage seedlings, including forage legumes. These caterpillars feed on a variety of plants and have four to five generations each year. Their populations are often at seasonal highs when forages are planted in autumn. These insects feed on foliage, not seeds.

Caterpillars present at the time the seed is planted may have already completed their development by the time the seedlings emerge. Therefore, scout for this insect shortly after seedlings have emerged and at 10-day intervals thereafter. Scouting is especially important following a hot, dry summer, as these weather conditions make fall armyworms worse. It will probably be economical to apply an insecticide for caterpillar pests if there are two or more caterpillars per square foot (Table 3).

Table 2. Suggested Insecticides for Control of Grubworm (Green June Beetle Larvae)

Common name	Active ingredient per acre (lb)	Trade name	Rate of formulated product per acre	Grazing or preharvest interval (days)	Approved crop uses
carbaryl	1.5	Sevin XLR or Sevin 4F	1.5 qt	7 to 14 ¹	clover, alfalfa, perennial grass sod
	1.5	Sevin 80S	1.9 lb	7 to 14	

¹14 days if applied to perennial grass sod, 7 days for alfalfa and clover

Table 3. Suggested Insecticides for Control of Defoliating Caterpillars (*Spodoptera* spp., *Helicoverpa zea*)

Common name	Active ingredient per acre (lb)	Trade name	Rate of formulated product per acre	Grazing or preharvest interval (days)	Approved crop uses
carbaryl	1 to 1.5	Sevin XLR or Sevin 4F	1.0 to 1.5 qt	7 to 14 ¹	clover, alfalfa, perennial grass sod
	1 to 1.5	Sevin 80S	1.2 to 1.9 lb	7 to 14	
methyl parathion*	0.75	Cheminova Methyl 4EC	1.5 pt	15	alfalfa, perennial grass sod
methomyl*	0.2 to 0.45	Lannate LV Lannate SP	0.75 to 3.0 ² pt	3 to 7 ³	bermudagrass, alfalfa
	0.2 to 0.45		0.25 to 1 lb		
diflubenzuron*	0.12	Dimilin 2L	2 oz	1 (hay) 0 (grazing)	perennial grass sod
other materials	(see <i>Alabama Pest Management Handbook</i>)				alfalfa

¹ 14 days if applied to perennial grass sod, 7 days for alfalfa and clover

² Recommended maximum rate is 1.5 pint for alfalfa, 3 pint for bermudagrass for Lannate LV, 0.5 lb for alfalfa and 1 pound for bermudagrass for Lannate SP

³ 3 days for hay, 7 days for grazing for bermudagrass, 7 days for grazing or harvest for alfalfa

* Restricted-use insecticide

Alfalfa weevil, clover leaf weevil, lesser clover leaf weevil (*Hypera* spp.)

Alfalfa weevil is a key pest of established alfalfa, requiring treatment almost every year. This insect, along with its relatives, can damage newly established alfalfa early in the spring. The alfalfa weevil larva is a green, legless caterpillar that has a black head and a white stripe down its back and is about ½ inch long when fully grown. Lesser clover leaf weevil has a brown head instead of a black head and is somewhat thicker and longer, about ¾ inch when fully grown. After an intermediate stage (pupa), the weevil larva turns into an adult, which has a hard body and a long snout.

Adult weevils begin to lay eggs in autumn and continue through early spring. Fall-laid eggs hatch soon after temperatures warm in early spring. Larvae feed for a few weeks and then enter the pupal stage, in which they transform into adult weevils. The overall feeding period extends from late February through mid-April since the eggs hatch over a prolonged period of time.

Check newly established alfalfa stands for signs of adult feeding, indicated by half circles of leaf tissue removed from the edges, and larval feeding, indicated by irregular-shaped holes chewed in the leaves. In severe cases,

the larvae eat all but the tough leaf veins and stems. When alfalfa is short (under 4 inches), treatment with an insecticide will probably be economical if there is one larva per stem (Table 4). When the alfalfa is taller, treat if there are more than two larvae per stem.

Rotational grazing has been shown to be effective in controlling weevils in established stands of grazing-tolerant alfalfa varieties. However, it is best to use an insecticide rather than grazing to control alfalfa weevil in a seedling stand. Grazing at this time would reduce the root growth of young plants, which is important to later production and stress tolerance.

It may be worthwhile to scout newly established perennial clover for alfalfa weevil and treat if necessary to obtain a good stand. Annual clovers will probably be used for grazing before alfalfa weevil and its relatives have time to do much damage.

Clover head weevil (*Hypera meles*). Clover head weevils are a severe pest in the Southeast, which is one reason why clover seed is produced elsewhere and shipped into the region. Clover head weevil larvae feed on the flowers, ovaries, and developing seeds of clover plants. This results in reduced seed set and less potential for natural reseeding. The weevil attacks most clover species. Feeding by

the adults and larvae on stems may cause flowers to lodge.

Clover head weevil adults overwinter in leaf litter and lay eggs in spring. Crimson clover is infested approximately 1 month (March-April) before white clover is (April-May). The larvae are similar in appearance to alfalfa weevil larvae, but they may vary in color from light green to yellow. Fully grown larvae are about 3/5 inch long.

If natural reseeding of clover is desired, scout for this insect when the clover is between 50 percent bloomed to fully bloomed. Treat with an EPA-approved insecticide if 10 to 20 percent of the flower heads are infested (see Table 1). Spray late in the day to avoid unnecessary hazard to pollinating insects. In order to comply with grazing and harvest restrictions, cattle must be removed. A well-timed insecticide application just before bloom may also be effective by killing the clover head weevil adult.

Clover seed weevils (*Tychius picirostris*). Clover seed weevil is another insect that attacks clover. This weevil prefers white clover; red clover apparently is not a host. The adult lays eggs inside the developing seedpod. Eggs hatch into plump, white, legless grubs with brown heads. Grubs move from seed to seed within the pod, where they are protected from insecticides. This insect is controlled in the adult stage. In clover seed production, control is recommended when there are more than two adult weevils per net-sweep after the first brown blooms appear (see Table 1). These recommendations are for seed production fields. In pastures, the tolerance for this insect is much higher, and treatment may not be justified.

Imported fire ants (*Solenopsis* spp.). Imported fire ants may feed on clover and alfalfa seeds. In most cases, the amount of seed they consume is not enough to make control economically feasible. However, parts of Alabama are now known to have fire ant colonies that have multiple queens. These fire ants are less territorial than others are and therefore may have

Table 4. Suggested Insecticides for Control of Alfalfa Weevil, Clover Leaf Weevil, and Lesser Clover Leaf Weevil in Newly Established Legumes

Common name	Active ingredient per acre (lb)	Trade name	Rate of formulated product per acre\	Grazing or pre-harvest interval (days)	Approved crop uses
carbaryl	1.5	Sevin XLR or Sevin 4F	1.5 qt	7	clover, alfalfa
	1.5	Sevin 80S	1.9 lb	7	
carbofuran*	0.5 to 1	Furadan 4F	0.5 to 1 qt	14 to 28 ¹	alfalfa
chlorpyrifos*	0.5 to 1	Lorsban 4E	1 to 2 pt	14 to 21 ²	alfalfa
cyfluthrin*	0.025 to 0.044	Baythroid 2	1.6 to 2.8 fl oz	7	alfalfa
gamma-cyhalothrin*	0.01 to 0.015	Proaxis	2.6 to 3.8 fl oz	1 to 7 ³	alfalfa
indoxacarb	0.065 to 0.11	Steward	6.7 to 11.3 fl oz	7	alfalfa
lambda-cyhalothrin*	0.02 to 0.03	Warrior with Zeon Technology	2.6 to 3.8 fl oz	1 to 7 ³	alfalfa
methomyl*	0.9	Lannate 90SP	1 lb	7	alfalfa
	0.9	Lannate 2.4 LV	3 pt	7	
permethrin*	0.1 to 0.2	Permethrin 3.2EC	6.4 to 12.8 fl oz	0 to 14 ⁴	alfalfa
	0.1 to 0.2	Pounce 3.2EC	4 to 8 fl oz	0 to 14 ⁴	
	0.1 to 0.2	Pounce 25 WP	6.4 to 12.8 fl oz	0 to 14 ⁴	
	0.1 to 0.2	Pounce WSB	6.4 to 12.8 fl oz	0 to 14 ⁴	
zeta-cypermethrin*	0.014 to 0.025	Mustang Max 0.8E	2.2 to 4 fl oz	3	alfalfa

¹ 14 days for 0.5 qt rate, 28 days for 1 qt rate

² 14 days for 1 pt rate, 21 days for >1 qt rate

³ 1 day for harvest for forage, 7 days for harvest for hay

⁴ 0 days for 0.1 lb active ingredient per acre or less, 14 days for higher rates

*Restricted-use insecticide

more mounds and more foraging ants per acre. If there are more than 100 mounds per acre, the fire ants probably have multiple-queen colonies. In such a case, it may be worthwhile to control the fire ants before over-seeding legumes in grass sod. Apply hydramethylnon (AmdroPro) bait at a rate of 1.0 to 1.5 pounds per acre 3 to 4 weeks before seeding or methoprene (Extinguish) at the rate of 1 to 1.5 pounds per acre in the spring or early summer before seeding.

White grubs, cutworms, and wireworms. Several kinds of white grubs can feed on the roots of young legume plants. Wireworms can damage the roots or the shoots. Cutworms can kill a seedling by cutting it at ground level. Nothing can be done to control these insects in clover. For alfalfa, there is a supplemental label for chlorpyrifos (Lorsban 15G) that allows it to be applied in-furrow or broadcast-incorporated at planting time (6.7 lb Lorsban 15G per acre). A 21-day grazing restriction applies following the treatment.



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Kathy Flanders, *Extension Entomologist*, Associate Professor, Entomology and Plant Pathology, and **Don Ball**, *Extension Agronomist*, Alumni Professor, Agronomy and Soils, both at Auburn University

Use pesticides **only** according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label.

The pesticide rates in this publication are recommended **only** if they are registered with the Environmental Protection Agency and the Alabama Department of Agriculture and Industries. If a registration is changed or cancelled, the rate listed here is no longer recommended. Before you apply any pesticide, check with your county Extension agent for the latest information.

Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

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