

Fall Armyworm in Pastures and Hayfields

The fall armyworm, *Spodoptera frugiperda*, is a chronic pest in the Southeast. The caterpillars feed on a variety of forage crops, but seem to prefer lush, green, well-fertilized bermudagrass. Other forage grasses which are hosts for fall armyworm are bahiagrass, pearl millet, sorghum-sudan hybrids, tall fescue, and various winter annuals including ryegrass, rye, wheat, and oats. More than 60 plants have been reported as hosts of the fall armyworm, including corn, alfalfa, cotton, soybeans, and most vegetable crops.

Seasonal Occurrence

As the name indicates, fall armyworms are most numerous in late summer or early fall. Usually, reports of fall armyworm damage begin to come in during late July or early August. First reports are usually from southern Alabama. There are three or more generations of fall armyworm each year. Occasionally, severe outbreaks occur as early as mid-April.

Fall armyworms are susceptible to cold, and are unable to survive even the mildest winters in Alabama. Each year, fall armyworm moths, carried by air currents, make their way from southern Florida and Central and South America. The size and timing of the initial moth flights are two factors that influence the outbreak potential of this pest.

Droughty conditions are favorable for the fall armyworm.

Behavior Patterns

The fall armyworm is in the same insect family (*Noctuidae*) as cutworms and other armyworms. Fall armyworm caterpillars damage grass by chewing plant tissue.

Fall armyworms are typically most active early in the morning, late in the afternoon or in early evening, but on taller, unmowed grass, they can be observed feeding on foliage throughout the day. On closely grazed or recently mowed hayfields, fall armyworm larvae spend the warmer hours of the day deep in the sod.

Fall armyworm damage often seems to appear “overnight.” Young armyworms don’t eat much. Almost all the damage is caused by the oldest caterpillars which eat more than all the other ages put together (See Figure 1). Therefore, an infestation may have been present but not detected because of the small size of the caterpillars.

Another reason for the sudden appearance of this insect is that the larger fall armyworms will sometimes “march into” (quickly invade) an uninfested area in search of food once an adjacent field has been defoliated. Large armyworms frequently disappear almost as suddenly as they appeared, either burrowing into the ground to pupate or moving on in search of food.

Damage

Fall armyworm damage may vary in appearance and severity according to the type of grass and management practices. In closely grazed fields, the grass may seem to thin out and develop brown spots similar to those sometimes seen on golf courses (See Figure 2). These spots look burned or browned out. This appearance is the result of grass plants rapidly dehydrating after fall armyworm larvae have chewed off the tender

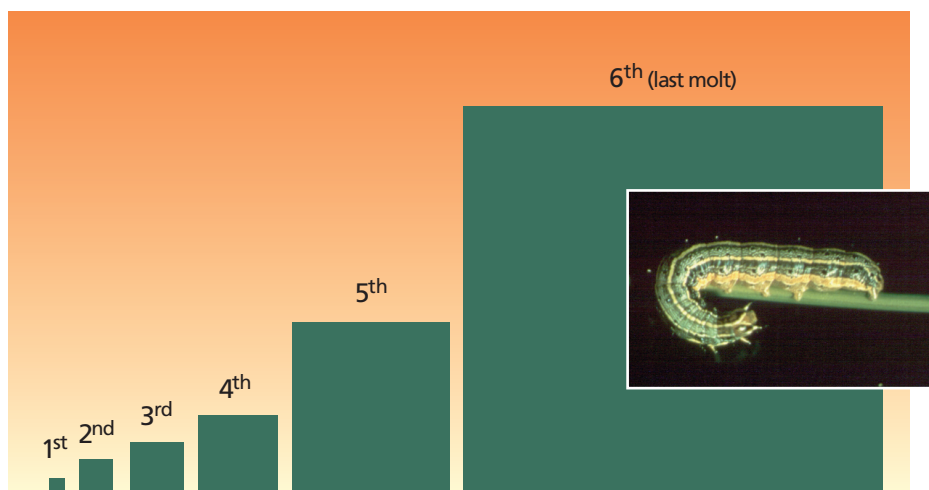


Figure 1. Relative amounts of food eaten by a fall armyworm caterpillar during each growth stage.



Figure 2. Fall armyworm damage on closely mowed grass. Note brown patches resembling drought damage.

foliage. For this reason, fall armyworm damage often resembles drought damage.

In hayfields or in pastures where there has been substantial growth accumulation, virtually all tender green material may be removed, leaving only tough stems a few inches long protruding from the soil surface (See Figure 3). Brown patches appear in the field and can rapidly increase in size.

Established, healthy, bermudagrass is rarely killed by fall armyworms, but the complete defoliation caused by a severe infestation weakens plants and deprives livestock of pasture or a hay producer of a hay cutting.

Fall armyworm damage on newly established grasses including winter annuals, tall

fescue, or orchardgrass can be an even more serious situation. Seedlings of these fall-seeded plants are small when populations of fall armyworm are at seasonal highs. These crops can be severely stunted or killed if fall armyworms feed too far down on these plants.

Description and Life Cycle

Adult. The adult fall armyworm is an ash-gray moth with a wing-span of about 1½ inches. The front wings are mottled and have white or light gray spots near the tips. The back wings are white with a narrow, smoky-brown edge. Moths become active at twilight and feed on nectar. They have an average life span of 2 to 3 weeks.

Eggs. The female moths lay eggs at night in masses of up to several hundred on light-colored surfaces, such as fence rails, tree trunks, and the underside of tree limbs. The eggs are light gray and covered with grayish fuzz from the female's body. These masses darken with age, and the eggs hatch within 2 to 4 days. All the eggs within a mass hatch at about the same time.

Larvae (caterpillars). The tiny, light-colored, black-headed larvae spin down to the ground on silken webs and begin to feed. As they grow, their bodies

darken and noticeable stripes appear. When fully grown, larvae may be up to 1½ inches long and vary in color from light green to almost black with several stripes along the body (See Figure 4). The "face" is marked with a light-colored inverted "Y." Just behind the head, on the back of the caterpillar, you will see three thin white stripes running the length of the next segment. Sometimes these lines extend along the length of the caterpillar, as seen in Figure 4. There are usually small dark spots on the top side of each segment of the body. On the next-to-last segment, these spots are arranged like the corner points of a square (See Figure 5).

Pupae. Development from egg to fully grown larva requires about 2 to 3 weeks. At this point, larvae burrow into the soil and form pupae. The moths emerge in about 10 to 14 days.

Management Tips for Perennial Grass Pastures and Hayfields

Fall armyworm damage is most likely to occur from August through October when populations are at seasonal highs. During periods of drought, it is not uncommon to receive the first reports of damage in July. Natural enemies of the armyworm are less effective during drought years.

Damage from armyworms seems to come in "waves," about a month apart. This is because moth activity and egg laying peak periodically even though there is substantial overlap between generations. Fields damaged by fall armyworm should be closely monitored for the rest of the season to determine whether further treatment is required. Two weeks after damage has occurred, start checking for small caterpillars.



Figure 3. Fall armyworm damage in a hayfield. Caterpillars have eaten the tender, green portions of the grass, leaving jagged leaf edges and tough leaf bases.

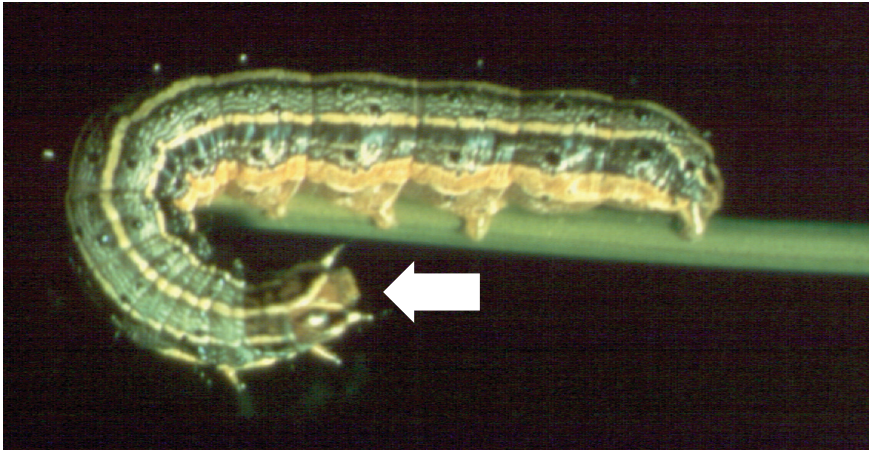


Figure 4. Fully grown fall armyworm larva. Note inverted "Y" on the head capsule and the three white stripes just behind the head.

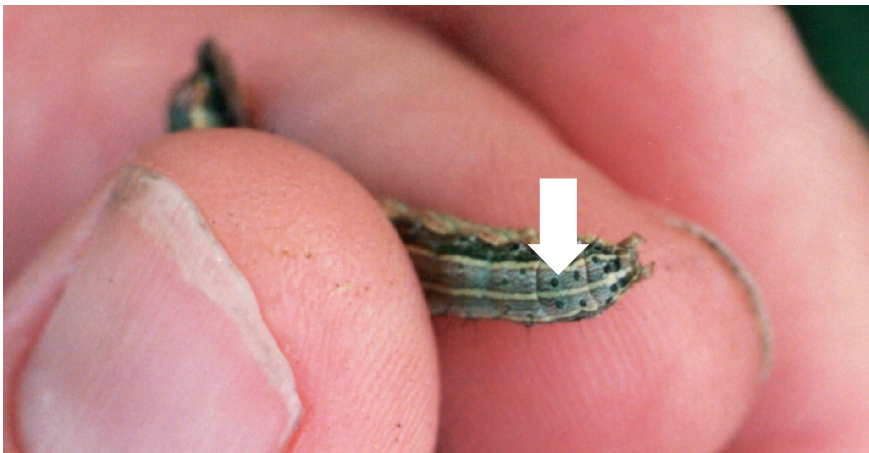


Figure 5. Fully grown fall armyworm larva. Note set of four dots on the end of the abdomen.

Because moths prefer light-colored surfaces on which to lay eggs, check these first. In pastures and hayfields, fence rails, fence posts, and tree limbs are favored egg-laying sites.

If a hayfield has been heavily damaged, fertilize as recommended to allow for another hay crop. Badly damaged pastures may need to be "rested." If possible, restrict grazing on badly damaged pastures until the grass has regrown.

Scouting. Scouting pastures and hayfields can help detect fall armyworm infestations before they cause economic damage. An easily detectable sign of armyworms is the presence of flocks of birds (especially cattle egrets) feeding in pastures or hay fields.

Closely examine areas where birds are congregating.

In established pastures or hayfields, check in and around areas with dead grass or where birds are congregating. If no caterpillars are seen on the grass, look in the thatch at the base of the plants for larvae and green pellets of frass (larval excrement) about the size of bahiagrass seeds. If available, use an insect net to "sweep" the grass in early morning or late afternoon to check for the presence of young fall armyworms. In fields wet with dew, you can find caterpillars stuck on tires of vehicles that have been driven through an infested field.

Treatment Threshold. The decision to treat for fall armyworms depends on the stage of the armyworms and the intended use of the forage. A population of 3 or more fall armyworms per square foot is a reasonable treatment threshold.

As with other pests, timing is important. If infestations are detected too late, the damage may already have been done.

If necessary, treat with insecticides at the right time. Small fall armyworms are much easier to kill than larger ones. Some products will not control large larvae at all. If you check an area properly, you can determine the extent of an infestation, and spot-treat.

Frequently, mowing is the best option for salvaging a hay crop. When this approach is taken it may be possible to avoid using an insecticide.

Insecticidal Control. If control is necessary on perennial grass pastures and hayfields, numerous insecticides may be effective (see Table 1). Pay close attention to grazing and harvest restrictions. Note that methomyl is registered for use only on bermudagrass.

- Apply insecticides early or late in the day, because fall armyworm larvae are most active at these times.

- Apply sprays by ground in a minimum of 30 to 40 gallons of water per acre, or by air in a minimum of 3 to 5 gallons of water per acre. Control of larvae longer than $\frac{3}{4}$ inch may be poor. Control of larvae in tall or thick stands of grass may also be poor. If possible graze the affected area before treating.

Additional Information

You can obtain more information from your county Extension office. Look in your telephone book under your county's name to find the number.

For the most up-to-date control recommendations on pastures and hayfields, small grains, corn, and other crops, check the annually updated Extension publication ANR-0500-A, *Alabama*

Pest Management Handbook, Volume 1, available from your county Extension office or online at <http://www.aces.edu/pubs/docs/A/ANR-0500-A>.

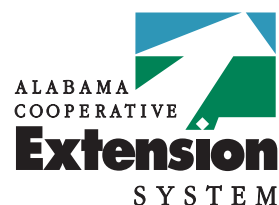
Table 1. Suggestions for Control of Fall Armyworm in Perennial Grass Pastures and Hayfields

Insecticide and Formulation	Rate ¹	Signal Word/Use Restrictions ³	Minimum Days from Last Application to Harvest or Grazing	Comments
beta-cyfluthrin Baythroid XL	0.02 to 0.22 lb ai/A 2.6 to 2.8 fl oz/A	Warning/ Restricted Use	0	
carbaryl ² Sevin XLR Plus	1.0 to 1.5 lb ai/A 1.0 to 1.5 qt/A	Caution	14 (harvest or grazing)	
cyfluthrin Tombstone Helios	0.025 to 0.03 lb ai/A 1.6 to 1.9 fl oz/A	Warning/ Restricted Use	0	Use higher rate for heavy population and larger caterpillars.
diflubenzuron ² Dimilin 2L	0.12 lb ai/A 2 fl oz/A	Caution/ Restricted Use	1 (hay), 0 (grazing)	Apply before armyworms are ½ inch long because caterpillars keep eating until their next molt. For maximum control apply at first sign of egg hatch.
lambda-cyhalothrin ² Karate with Zeon Technology	0.02 to 0.03 lb ai/A 1.28 to 1.92 fl oz/A	Warning/ Restricted Use	7 (hay), 0 (grazing)	Use higher rate for heavy populations, larger caterpillars, or dense foliage.
methomyl ² Lannate IV 2.4	0.22 to 0.9 lb ai/A 0.75 to 3 pt/A	Danger: Poison/ Restricted Use	3 (hay), 7 (grazing)	Use only on bermudagrass. Use higher rate for heavy populations and larger caterpillars.
methoxyfenozide Intrepid 2F	0.06 to 0.12 lb ai/A 4 to 8 fl oz/A	Caution	7 (hay), 0 (grazing)	Use higher rate for heavier infestations or dense foliage. Larvae stop feeding almost immediately but may take several days to die.
methyl parathion ² Cheminova Methyl 4EC	0.75 lb ai/A 1.5 pt/A	Danger: Poison/ Restricted Use	15 (harvest or grazing)	Will not control large caterpillars. No residual activity.
rynaxypyr Coragen	0.045 to 0.065 lb ai/A 3.5 to 5 fl oz/A	No Signal Word	0	Larvae become paralyzed soon after eating the foliage then die in 1 to 3 days.
spinosad ² Tracer SC	0.03 to 0.06 lb ai/A 1 to 2 fl oz/A	Caution	3 (hay), 0 (grazing)	Do not allow cattle to graze until the foliage has dried. Use higher rate for heavy populations and larger caterpillars.
zeta-cypermethrin ² Mustang Max	0.0175 to 0.025 lb ai/A 2.8 to 4 fl oz/A	Warning/ Restricted Use	0 (harvest or grazing)	Use higher rate for heavy populations and larger caterpillars.

¹Amounts listed are for the formulated product, unless otherwise indicated by ai, which is the amount of active ingredient per acre.

²Other products containing this active ingredient may be available.

³Signal words describe the acute (short-term) toxicity of the product. Products with no signal word or with the word "caution" are the lowest in toxicity.



ANR-1019

Kathy L. Flanders, Extension Entomologist, Associate Professor, Entomology and Plant Pathology; **Donald M. Ball**, Extension Agronomist, Professor, Agronomy and Soils; and **Patricia P. Cobb**, Professor Emerita, all with Auburn University

Photographs by Patricia Cobb, John French, and Kathy Flanders.

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 canceled, 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.

For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

Published by the Alabama Cooperative Extension System (Alabama A&M University and Auburn University), an equal opportunity educator and employer.