

Insect Pests of Cotton: Grasshoppers

► Grasshoppers are sporadic pests of cotton across Alabama Understanding grasshopper traits is key to managing infestations and mitigating crop damage.

Grasshoppers (Orthoptera: Acrididae) have been a sporadic pest of seedling cotton in Alabama for many years. The primary species that damages cotton is the differential grasshopper, *Melanoplus differentialis*. Adult male differential grasshoppers range from 1 to 1.5 inches long, while females may be up to 2 inches long. Adults may be green or brownish and tend to darken as they mature. Immature grasshoppers resemble adults but are smaller and lack fully developed wings.

Distribution and Life Cycle

Grasshoppers are a polyphagous insect that may feed on a variety of plant species across Alabama. The life cycle begins as an egg overwintering in the soil. Dry winters are favorable for the survival of grasshopper eggs in the soil. Egg hatch begins in late March and continues throughout April, May, and June as soil temperatures rise and spring rains occur.

The first nymph (immature) to leave the egg pod makes a tunnel through which the succeeding nymphs emerge from the pod to the soil surface. Nymphs feed and grow for 35 to 50 days before becoming adults. Their development proceeds most rapidly when the weather is warm but not too wet.

Adult grasshoppers mate and continue feeding on plants. About 2 weeks later, females begin to deposit clusters of eggs in the soil. Soil particles are glued together around the eggs to form a protective pod. Each pod may have 25 to 150 eggs. Most grasshopper species only complete one generation per year.



Figure 1. Immature differential grasshopper.



Figure 2. Adult differential grasshoppers.

Pest Status

Grasshopper problems are greater in reduced tillage fields and lighter soils or those with higher sand content. Damage often occurs in the same fields or farms from year to year. Although predicting when economic infestations will appear is difficult, it is known that overwintering populations are influenced by environmental conditions. Rainfall is likely more important than temperature.

Grasshoppers may feed on foliage, but most economic damage occurs from feeding on the main stem of emerging seedlings (in the crook or cracking stage), leading to reduced stands. In some cases, grasshoppers may completely sever the stem, but more often they will chew partially through the stem weakening the plant, which will fall over at the feeding site.

Management Strategies

In fields with historic grasshopper problems, preventative approaches, such as adding an insecticide to burndown herbicides, may be needed. Since not all grasshoppers emerge from the egg stage at the same time, a long residual insect growth regulator (IGR) insecticide could also be utilized.

There are no established thresholds for grasshoppers in cotton, and there likely never will be since their feeding habits are so unpredictable. Some fields and some years may have grasshopper damage while other fields and years have the same level of grasshoppers but no damage.

Preventative insecticide applications for grasshoppers are a judgment call. When grasshoppers are observed and cotton is in the susceptible stage, treatments can be based on the risk level that an individual grower is willing to take. Most cotton insecticides will control immature grasshoppers when applied at a low labeled rate. Later into the spring, adult grasshoppers are very difficult to control with any insecticide, even at a high labeled rate.

Current insecticide recommendations for grasshoppers can be found in the *Alabama Cotton IPM Guide* (Extension publication IPM-0415).



Figure 3. Differential grasshopper next to a cotton seedling.



Figure 4. Relative size of immature grasshoppers that have merged during a 14-day period.



Figure 5. Severed and partially chewed cotton seedlings, likely a result of grasshopper feeding.



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