

## Problem: Grasshoppers



**Hosts:** Too numerous to mention.

### Description:

Of the approximately 115 grasshopper species found in Kansas, only 5 are considered to pose serious threats to vegetable crops. Important species include redlegged, migratory, Packard, differential, and two-striped grasshoppers. The differential and two-striped grasshoppers are most frequently encountered by home gardeners and commercial vegetable producers. Adults of the differential and two-striped grasshoppers can be separated from most others by their large size. Adults of both are robust and average 1 ½ to just under 2 inches in length. Differential grasshopper coloration is predominantly yellow and black, and the insects have complete chevrons (V-shaped patterns) on hind leg femurs. Two-striped grasshoppers are basically brownish or grayish. When viewed from above, there are two yellow (or cream colored) stripes running down the top of the head and meeting halfway down the wings. Chevron development on hind leg femurs is incomplete (i.e. dark markings are confined to the upper half).

No single "seasonal life history" is applicable to all species of grasshoppers. However, some similarities do exist. For instance, all grasshoppers undergo incomplete metamorphosis. That is, there are three life stages: egg, nymph and adult. Most overwinter underground as fall-laid, banana-shaped eggs contained in pods.

Immediately after being deposited, eggs begin to develop until a specific point is reached where diapause prevails. Diapause is described as a state of low metabolic activity which helps some insects survive the rigors of winter. When springtime soil temperatures reach 50 to 55° F, embryonic development resumes. All grasshoppers within an individual pod emerge from their eggs simultaneously. They tunnel up to and emerge from the soil surface where feeding begins.

With the exception of their small size and lack of wings. Newly emerged first instar nymphs resemble adult grasshoppers in shape. As nymphs continue to grow and develop, they periodically shed their skins in a process called molting. Eventually, wing pads become apparent. Body size and wing pads increase in size in each succeeding instar, the term for the developmental stages between molts. After a final molt, full-sized winged adults appear.

### **Recommendations:**

The insecticides registered for use against grasshoppers are usually effective against those directly contacted by sprays. However, most have limited residual action and, therefore, must be reapplied in order to eliminate new arrivals.

- Immature grasshoppers have a somewhat limited range over which they can migrate because they lack wings and therefore *must crawl* to new food sources.
- This is the best time to apply insecticides because the grasshoppers are small and clustered together and therefore easy to control.
- Mature grasshoppers can fly, enabling them to migrate over greater distances.
- Movements of migrating grasshoppers may be of short or long duration depending on the total number of individuals produced.

Insecticides labeled for the widest variety of crops include permethrin (numerous trade names), cyfluthrin (Bayer Vegetable & Garden Insect Spray), carbaryl (Sevin), lambda-cyhalothrin (Bonide Beetle Killer, Bonide Caterpillar Killer) and gamma-cyhalothrin (Spectracide Triazicide).

### **References:**

1. [Grasshoppers in the Lawn and Garden](#), K-State Research & Extension, Entomology Pub L-868.

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