
GRASSHOPPERS

Integrated Pest Management for Home Gardeners

Grasshoppers are sporadic pests in gardens. However, in some years large populations may build up in foothills and rangelands, especially after a wet spring and then migrate into nearby gardens, often defoliating everything in sight. Over 200 species of grasshoppers occur in California, but only a few of these cause significant problems in gardens. The devastating grasshopper, *Melanoplus devastator*, and the valley grasshopper, *Oedaleonotus enigma*, are the most widespread and destructive.

IDENTIFICATION AND LIFE CYCLE

Grasshoppers are readily distinguished from most other insects. Their hind legs, with greatly enlarged femurs, are well adapted for jumping (Fig. 1). Their bodies are robust and their antennae relatively short. In contrast, two other common garden pests in the order Orthoptera, crickets and katydids, have long antennae. Most grasshoppers are winged and many are good flyers, although a few species are flightless.

In late summer and fall, adult female grasshoppers deposit their eggs in soil in undisturbed areas such as grassy foothills, ditchbanks, roadsides, fence rows, pasture areas, and alfalfa fields. Cultivated gardens do not seem to be a common site for egg-laying. Eggs are laid in the upper 2 inches of soil in elongate egg pods that contain 20 to more than 100 eggs (Fig. 2). When soil temperatures warm in spring, the eggs hatch and the young nymphs begin to feed on nearby plants. Nymphs readily move to new locations when food supplies disappear. Most species molt five

to six times before becoming adults and usually have only one generation a year. Adult grasshoppers can live 2 to 3 months; they die out when food becomes scarce or when the weather becomes too cold. Many grasshoppers are consumed by predators such as birds, blister beetles (which feed on eggs), and robber flies. Fungal and bacterial diseases and parasites also kill grasshoppers.

Grasshopper population size varies from year to year and severe outbreaks normally occur only every 8 to 10 years. Some outbreaks last 2 or 3 years. If favorable conditions such as warm, moist springs that produce a lot of food in the foothills and uncultivated areas persist for several years, populations may build to high levels. Major migrations, which cause the most damage, occur when populations are high and forage becomes depleted. Nymphs typically move downhill toward green vegetation. Adults may fly 15 or more miles a day in large swarms during migrations.

DAMAGE

Most grasshoppers are general feeders, but they prefer young, green plants, especially lettuce, beans, corn, carrots, onions, and some annual flowers. Squash and tomatoes are among the vegetables least favored by grasshoppers. Grasshoppers have chewing mouthparts and remove large sections of leaves and flowers, sometimes devouring entire plants. Garden damage is usually limited to a few weeks in early summer immediately after range weeds dry up. However, during major outbreaks, grasshoppers will feed on

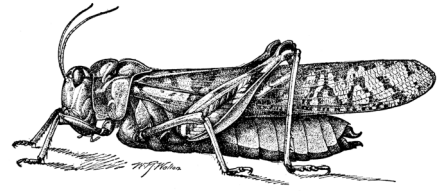


Figure 1. Grasshopper.

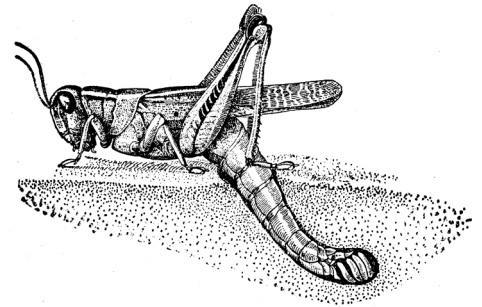


Figure 2. Grasshopper depositing eggs in soil.

almost any green plant and damage may occur over a considerably longer period.

MANAGEMENT

Grasshoppers are among the most difficult insect pests to manage in the garden. When numbers are low, they can be hand-picked and squashed. Cones, screened boxes, floating row covers, and other protective covers provide some protection if numbers are not high. However, grasshoppers will eat through cloth or plastic row covers if they are hungry enough. Try using metal window screening. Poultry, including chickens and guinea

hens, are excellent predators, but can also cause damage to some garden plants.

One strategy that can be used in gardens where migration of grasshoppers frequently occurs is to keep an attractive green border of tall grass or lush green plants around the perimeter of your garden to trap insects and divert them from your vegetables or flowers. Don't mow this trap crop or let it dry out, or you will send the grasshoppers straight into your garden.

During years when huge numbers of grasshoppers are migrating, there is almost nothing you can do to protect your plants once the invasion has reached your garden. The best strategy

in agricultural and rangeland areas during major migrations is to treat the grasshoppers with an insecticide early in the season when they are still young nymphs residing in uncultivated areas. Usually gardeners do not have control over these areas, however, so their management options are few. Gardeners can apply a bait containing carbaryl around the borders of their garden before grasshoppers arrive. If a grasshopper trap crop is being grown around the border of your garden, these plants can be baited or sprayed with carbaryl or other products to kill grasshoppers. These insecticides have only a few days of residual activity against grasshoppers, and baits lose their effectiveness after rain or irrigation, so they will need to be reapplied

if migrations continue. Small grasshopper nymphs are easier to control with insecticides than adults and large nymphs.

Once grasshoppers have invaded the garden, insecticides will not be very effective. Reserve the use of insecticides for serious situations where they may provide a significant level of control. Carbaryl, especially in its spray form, is very toxic to bees, to natural enemies of grasshoppers, and to aquatic life.

REFERENCE

Flint, M. L. 1998. *Pests of the Garden and Small Farm*. 2nd ed. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 3332.

For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

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 ILLUSTRATIONS: Fig. 1: from H. E. Smith. 1915. *The Grasshopper Outbreak in New Mexico during the Summer of 1913*. Washington DC: USDA Bulletin No. 293. Fig. 2: from T. D. Urbahns. Washington DC: USDA Farmers' Bulletin 1140.

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WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash nor pour pesticides down sink or toilet. Either use the pesticide according to the label or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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