GRASSHOPPERS

Grasshoppers are some of the most familiar of all insects, and more than 550 species occur in North America. Only a small number regularly damage gardens and almost all of these are in the genus *Melanoplus*. Species particularly injurious to plants include:

— **TWO emp; STRIPED GRASSHOPPER** (*Melanoplus bivittatus*)
— **DIFFERENTIAL GRASSHOPPER** (*M. differentialis*)
— **MIGRATORY GRASSHOPPER** (*M. sanguinipes*)
— **REDLEGGED GRASSHOPPER** (*M. femurrubrum*)
— **DEVASTATING GRASSHOPPER** (*M. devastator*)

**HOSTS** Although many types of grasshoppers particularly favor grasses, others feed preferentially on broadleaf plants or a mixture of grasses and broadleafs. Although almost all garden plants can be damaged, beans, leafy vegetables, iris, and corn are among the plants more commonly injured by grasshoppers.

**DAMAGE** Grasshoppers damage plants by chewing. Most feeding occurs on foliage, although immature pods and fruit may also be eaten. Bark from twigs is sometimes gnawed, causing girdling wounds that can produce dieback of branches.

**DISTRIBUTION** Redlegged grasshopper is found throughout the U.S. and southern Canada but is most common in the upper Midwest. Migratory grasshopper has an almost equally broad range but is absent in extreme southern Texas and Florida. Twostriped grasshopper is found everywhere except the Deep South. Differential grasshopper is present throughout the U.S. except in the extreme northeast, southeast, and northwest. It is most abundant between the Rocky Mountains and Mississippi River. Devastating grasshopper is confined to the Pacific States.

**APPEARANCE** The largest grasshoppers in this group are the differential and twostriped grasshoppers, with some adults more than 1½ inches long. A dark herringbone pattern on the hind femur characterizes differential grasshopper, although very dark forms are also sometimes produced. Two pale yellow stripes run along the back of the thorax and wings of twostriped grasshopper. Redlegged grasshoppers range from ¾ to 1 inch long with a bright yellow underside and red tibia on the hind leg. Migratory grasshopper is also medium sized, with a blue-green or reddish hind tibia.

**LIFE HISTORY AND HABITS** As a generalized life history, *Melanoplus* grasshoppers spend the winter as eggs, in elongate egg pods containing 20–120 eggs inserted shallowly in soil. The eggs hatch in mid- to late spring, depending on temperature, location of the eggs, and species characteristics. Twostriped grasshopper is a very early hatching species, as some embryonic development occurs the previous season. Egg hatch of migratory grasshopper typically follows about 2–3 weeks later, and differential grasshopper eggs often hatch shortly after this. Redlegged grasshopper eggs hatch in late spring or early summer. In all four species, the period of egg hatch can extend over a considerable period if eggs are laid in scattered sites, or hatch may occur over a short period.

Development of the nymphs typically takes 5–7 weeks, during which time they pass through five or six nymphal instars. Females feed for about 2 weeks before laying eggs. Eggs are laid as pods, often containing 50 or more eggs, and several pods may be produced. Each species has preferences as to where it lays eggs, with some preferring sun-exposed sites with compacted soil. Egg pods are typically inserted into the soil, often around the crown area or roots of plants.

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A. Two-stripped grasshopper feeding on sunflower.
WHITNEY CRANSHAW

B. Pair of differential grasshoppers.
WHITNEY CRANSHAW

C. Migratory grasshopper.
SCOTT SCHELL, UNIVERSITY OF WYOMING

D. Redlegged grasshopper.
JIM KALISCH, UNIVERSITY OF NEBRASKA

E. Grasshopper egg pod.
DAVID L. KEITH, UNIVERSITY OF NEBRASKA

F. Clearwinged grasshopper.
WHITNEY CRANSHAW

G. Devastating grasshopper.
JACK KELLY CLARK, COURTESY OF UNIVERSITY OF CALIFORNIA STATEWIDE IPM PROGRAM.

H. Grasshopper laying eggs.
COLORADO STATE UNIVERSITY ARCHIVES.
Grasshoppers can show migratory behaviors. Nymphs sometimes march considerable distances in bands during outbreaks. Adults are capable of flight and may fly for several miles, often at elevations of several hundred feet above the ground. Modest physical changes may sometimes occur in populations that become more migratory. For example, thinner body size and longer wings are produced by twostriped and migratory grasshoppers that go into the more migratory phase.

Although grasshoppers in the genus *Melanoplus* are usually the species involved in damage to garden plants, there are some other species that can be regionally damaging or attract attention.

**CLEARWINGED GRASSHOPPER** (*Camnula pellucida*)\(^1\) has had several historical outbreaks in the Rocky Mountain/High Plains region. It is a fairly common species, found in most of North America except the southeastern states. Adults are medium-sized and yellow to brown with mottled forewings and transparent hindwings. Grasses are favored, and the species can be a severe pest of small grains, but it occasionally damages onions, lettuce, cabbage, and peas in gardens. Clearwinged grasshopper eggs hatch quite early in the season, following a few warm days in early spring, and most eggs hatch over a brief period. During the summer, when eggs are being laid, the females alternately move from feeding sites in fields to egg-laying beds where soil conditions are favorable.

**VALLEY GRASSHOPPER** (*Oedaleonotus enigma*)\(^1\) is found in semiarid areas of western North America, and is most commonly noted to be damaging in California. Eggs hatch in spring, often in early April in California, and they feed primarily on broadleaf plants, including shrubs. Both long-winged and short-winged (brachypterous) adult forms may be produced, with high temperatures favoring the latter.

**CAROLINA GRASSHOPPER** (*Dissosteira carolina*)\(^1\) is a common, large grasshopper sometimes seen hovering over areas of bare ground. The hindwings, exposed in flight, are colorfully marked with black and have a yellow border; however, the overall color of the grasshopper, and of the covering forewings, is tannish to gray brown. Carolina grasshopper feeds on a wide variety of plants but is rarely abundant enough to cause serious damage.

**EASTERN LUBBER GRASSHOPPER** (*Romalea guttata*)\(^2\) is the largest grasshopper found in North America. Heavy-bodied and reaching a length of 2 to almost 3 inches, it is a colorful insect of variable patterning, primarily black in young stages with more yellow and orange in the adults. The short, nonfunctioning wings are pinkish or reddish. Eastern lubber is found in the southeastern states, from South Carolina to east Texas. It is most abundant in slightly moist habitats where it feeds on a wide range of weedy plants, but it does occasionally invade vegetable and flower gardens. Eggs hatch in March and April. In much of the High Plains and southern Rocky Mountain region, the **PLAINS LUBBER** (*Brachystola magna*)\(^2\) is present and rivals eastern lubber in size. It feeds primarily on wild sunflower, kochia, hoary vervain, and other rangeland plants, rarely damaging cultivated plants. This species is usually green to brown and also has short wings.

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\(^1\) Orthoptera: Acrididae; \(^2\) Orthoptera: Romaleidae
A. Carolina grasshopper.
WHITNEY CRANSHAW

B. Eastern lubber grasshoppers feeding on crinum lilies.
DOUG CALDWELL, UNIVERSITY OF FLORIDA

C. Eastern lubber grasshopper.
DAVID SHETLAR

D. Pair of plains lubber grasshoppers.
WHITNEY CRANSHAW