



Grasshoppers

Grasshoppers can quickly defoliate a garden or landscape and are challenging to manage due to their large numbers. Biological control, physical barriers, and pesticides are the most effective tools to manage grasshoppers. As with all pest problems, the most effective management will occur when combinations of strategies are used.

There are about 400 species of grasshoppers found in the 17 Western States. Only 17% of these species are considered serious pests. Grasshoppers have chewing mouthparts and can occur in large numbers which often results in significant plant defoliation. These pest species normally feed on native vegetation. However, when grasshoppers can access novel plant species, they may eat them preferentially. This is the case with many annual flowers, vegetables, and forage crops. Among vegetable crops, lettuce, carrots, beans, sweet corn, and onions are often favored. New leaves and fruits of woody plants may also be impacted, but these plants can tolerate low level grasshopper damage. When grasshopper numbers are high and food choices are few, plants can be completely defoliated. Gardens and landscapes that receive the highest impact are often adjacent to open grasslands and/or shrublands.

Grasshoppers lay clusters of eggs in the soil during fall. Each cluster has 8 to 30 eggs and each female lays 7 to 30 clusters varying by species. The eggs overwinter in the soil and are extremely resistant to cold temperatures. Hatching date is determined by the maturation of the egg and soil temperature.

Juvenile grasshoppers look like smaller versions of the adult and are called nymphs. Most nymphs start feeding right away and continue to feed on the same plants as they mature into adults. To distinguish nymphs from adults, look for wings. Nymphs do not have mature wings but may have wing buds and cannot fly. Adults have fully developed wings and many species fly quite well. Grasshoppers begin laying eggs one to three weeks after reaching adulthood.

Grasshoppers have some natural enemies which include parasites, predators, and diseases. Small wasps of the family Mymaridae parasitize grasshopper eggs to offer some natural control. Parasitic nematodes, also called threadworms or hairworms, feed coiled-up inside grasshoppers and can cause death, sterility, or reduced vigor of the insect. Blister beetles and crickets are predators of grasshopper eggs. Spiders, wasps, robber flies, rodents, and birds eat nymphs and adult grasshoppers. Chickens also seem to be somewhat effective at managing grasshoppers.

Grasshoppers are susceptible to a large array of natural diseases caused by bacteria, viruses, protozoa, and fungi. *Nosema locustae* is a microsporidium fungus that has a toxic effect on grasshoppers and crickets. This fungus is the active ingredient in several baits used to control grasshoppers. The fungus is applied to wheat bran and a sweetening agent to create the bait. Grasshoppers eat the bait and become infected with the pathogen. The effects are not immediate, but the pathogen causes grasshoppers to stop feeding and become lethargic. It is most effective on nymphs and is less effective on adults. The best time for application is the spring just after they hatch out. It is most effective when applied over large areas (one acre or more) because of distances traveled by grasshoppers.

Chemical controls offer the advantage of quick results but require the proper equipment and knowledge of safe application practices. Some of the active ingredients labeled for grasshopper control are: bifenthrin, cyfluthrin, lambda-cyhalothrin, permethrin, esfenvalerate, and carbaryl. As with all pesticides, the label should be consulted to see if the pest (grasshopper) and the crop are listed for use with that pesticide formulation. Always follow the directions found on the label.

Home gardeners may also want to consider using a physical barrier made of lightweight, spun fabrics (also called Remay or frost cloth). These fabrics are often used for floating row covers and allow light penetration and some air circulation. These products may be found at garden centers and through mail order catalogs. Under severe circumstances, grasshoppers may start to feed on the fabric. In these situations, you may consider application of a residual insecticide to the fabric using the same precautions you would if applying it to a plant.

Regardless of management approach, grasshoppers can be destructive and their sheer numbers make management challenging.



Plains Lubber Grasshopper, *Brachystola magna*
<http://www.uwyo.edu/entomology/grasshoppers/field-guide/brma.html>
Photo by Isaac Mpanga

December 29, 2022

Adapted from original Backyard Gardener publications by Jeff Schalau, Agent, Agriculture & Natural Resources, University of Arizona Cooperative Extension, Yavapai County

The University of Arizona is an equal opportunity, affirmative action institution. The University does not discriminate on the basis of race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, or genetic information in its programs and activities.