

# Protecting U.S. Rangeland from Grasshoppers and Mormon Crickets

Rangeland in the Western United States is a valuable agricultural resource for livestock production and provides an important habitat for wildlife. Grasshoppers and Mormon crickets (referred to collectively as grasshoppers) are natural components of this ecosystem. However, their populations can reach outbreak levels and cause serious economic and ecological losses to rangeland forage, especially during periods of drought.

When a grasshopper outbreak threatens rangeland forage, Federal land management agencies, Native American tribes, State agriculture departments, county and local governments, private groups, and/or individuals can request assistance from the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) to suppress rangeland grasshopper populations.

## Grasshoppers and Mormon Crickets

Grasshoppers and Mormon crickets are closely related insects that belong to the order Orthoptera. Nearly 400 grasshopper species inhabit the Western United States, but only a small percentage are considered pest species. Anywhere from one to many grasshopper species can be found in a particular rangeland ecosystem, and economic damage usually occurs when pest grasshopper species increase in number.

Grasshoppers are typically ground-dwelling insects with powerful hind legs that enable them to escape from threats by leaping vigorously. They are sometimes referred to as short-horned grasshoppers to distinguish them from katydids (bush crickets), which have much longer antennae. Mormon crickets (*Anabrus simplex*) are flightless, shield-backed katydids. Although they do not fly, Mormon crickets are highly mobile and capable of migrating great distances. They move in wide bands by walking or jumping, and may devour much of the forage in their path.

Both insects damage grasses and other vegetation by consuming plant stems and leaves. Their feeding causes direct damage to plants' growth and seed production. This reduces valuable livestock forage and can lead to other effects, including soil erosion and

degradation, disruption of rangeland nutrient cycles, interference with rangeland water filtration, and potentially irreversible changes in the rangeland ecosystem. In addition, some populations that develop on rangelands can invade adjacent cropland where the value of crop plants is much higher than that of rangeland grasses.

## APHIS' Grasshopper Program

APHIS surveys rangeland grasshopper populations in 17 Western States: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. In addition, APHIS provides technical assistance on grasshopper management to landowners and managers, delivers public outreach and education programs, and may work with Federal and State agencies, tribes, and landowners to suppress grasshopper populations when direct intervention is necessary.

APHIS treats grasshoppers only upon request and after determining that treatment is warranted. When a Federal land management agency, Native American tribe, State agriculture department, county or local government, private group, or individual with jurisdiction over the land makes a written request for grasshopper treatment, APHIS visits the site and assesses various factors to determine whether action is necessary. These factors include, but are not limited to, grasshopper densities per yard, the pest species and its biological stage, treatment timing and options, and other ecological considerations. County, State, and Federal officials, tribes, and/or rancher groups may also initiate cooperative local programs and request APHIS assistance when surveys show the potential for large grasshopper populations.

## Cost Sharing for Grasshopper Suppression Treatments

Federal agencies own or manage approximately 43 percent of U.S. rangeland. The U.S. Department of the Interior's Bureau of Land Management, the Bureau of Indian Affairs or individual tribes, and USDA's Forest Service are among the principal managers of the



rangeland. Federal rangeland eligible for cooperative grasshopper suppression treatments from APHIS includes: areas with widespread outbreaks; areas with developing or incipient populations of grasshoppers, that, if treated, would prevent a wider spread of outbreaks; and Federal or Trust land borders that, if treated, would prevent the movement of economically threatening populations of grasshoppers to adjacent private agricultural lands.

APHIS shares the costs of providing grasshopper suppression treatments on Federal, State, and private rangeland as directed by the Plant Protection Act. On Federal and tribal Trust lands, APHIS pays 100 percent of the treatment cost. On State lands, APHIS provides 50 percent of the funds for treatment and control. On private rangelands, APHIS provides 33 percent of the funding, with the State and/or private landowner responsible for paying the remainder of the treatment cost. This cost share is only available if APHIS conducts the suppression treatments.

APHIS does not have the authority to conduct grasshopper suppression programs on private crop lands. However, APHIS conducts rangeland treatments in areas where federally administered rangeland is immediately adjacent to crops. This not only protects the rangeland forage, but also prevents grasshoppers from moving into the adjacent crops. In these situations, APHIS does not treat the crop land, only the adjacent rangeland; the crop owner is responsible for any crop land treatments that may be needed. In addition, if small amounts of croplands (typically less than 10 percent of the treatment area) are interspersed in a rangeland treatment block, APHIS could treat the entire block in order to maintain the continuity of the spray program. The insecticide, however, must be labeled for use on that crop. In such cases, the private landowner would pay 100 percent of the cost for treatments conducted on their crop land.

## Treatment Options

In 2002, APHIS completed the Rangeland Grasshopper and Mormon Cricket Suppression Program Final Environmental Impact Statement (EIS). The EIS considered three alternatives for managing grasshopper/Mormon cricket populations. The alternatives were: no APHIS control action; insecticide applications at conventional rates and complete area coverage; and reduced agent area treatments (RAATs), an approach that treats less land area and uses insecticides at lower rates. The RAAT strategy relies on an insecticide's ability to suppress



grasshoppers within treated swaths—and the natural movement of grasshoppers into the treated swath as they forage—while conserving grasshopper predators and parasites in alternating untreated areas.

APHIS uses three insecticides in its grasshopper program: carbaryl, diflubenzuron, and malathion. Treatment consists of a single application of only one of these three. Each insecticide is currently registered for use and labeled by the U.S. Environmental Protection Agency for control of rangeland grasshoppers. The insecticide APHIS chooses depends on a number of factors, including: infestation size; grasshopper species; population age; climate; weather; forage condition; economics; and environmental risks. Each insecticide is very effective and safe when properly used under the right conditions. In addition, APHIS conducts environmental assessments in each State before any actions occur. APHIS follows all insecticide label directions, along with conditions outlined in the EIS, the environmental assessment, grasshopper program guidelines, and the original treatment request letter.

## Additional Information

For additional information on APHIS' grasshopper program, please visit the APHIS Web site at <http://www.aphis.usda.gov/plant-health/grasshopper>, or contact your State Plant Health Director (SPHD). You can find contact information for your SPHD on APHIS' Web site at <http://www.aphis.usda.gov/planthealth/sphd>.