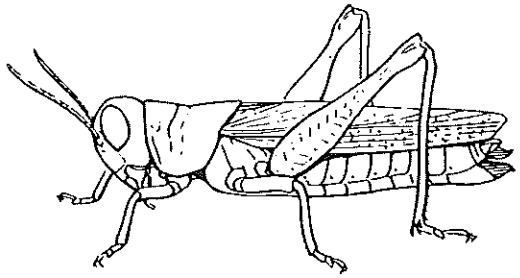
Ferry County

WASHINGTON STATE UNIVERSITY
EXTENSION

Grasshopper Management Tips



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WSU Ferry County Extension
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FOR IMMEDIATE RELEASE

GROWING YOUR OWN FOOD IN FERRY COUNTY – A Plague of Locusts
WSU Ferry County Extension Master Gardener, Twinflower Wilkie

Gardeners are asking WSU Ferry County Extension "What can I do about the grasshoppers?" Our plague doesn't reach Biblical proportions, but grasshopper infestations do tend to be cyclical (though not as predictably as cicadas) and we have been having a build-up for a few years. This year's no better and may be worse.

Most members of the order *Orthoptera,* family *Locustidae,* of the many species called grasshoppers, do not do significant damage to crops. There are two primary types of grasshoppers, migratory and non-migratory. Migratory grasshoppers fly great distances and move in swarms. When they've devastated one area, they move to another. Non-migratory types swarm over a somewhat smaller area, moving from more favored foods (your garden or hay field) to less favored foods (the laundry hanging on the line). Meanwhile, they lay multiple egg masses until they're killed by the cold, possibly as late as October in a mild autumn.*

Adults mate in late summer, the females lay their eggs in the ground. A gummy coating protects the egg mass from the cold until spring. The nymphs hatch out in May and June, about the time the lilacs begin to bloom, and go through five or six instars, (stages) shedding their skin so they can grow larger, maturing over about 40 days to fully winged adults.*

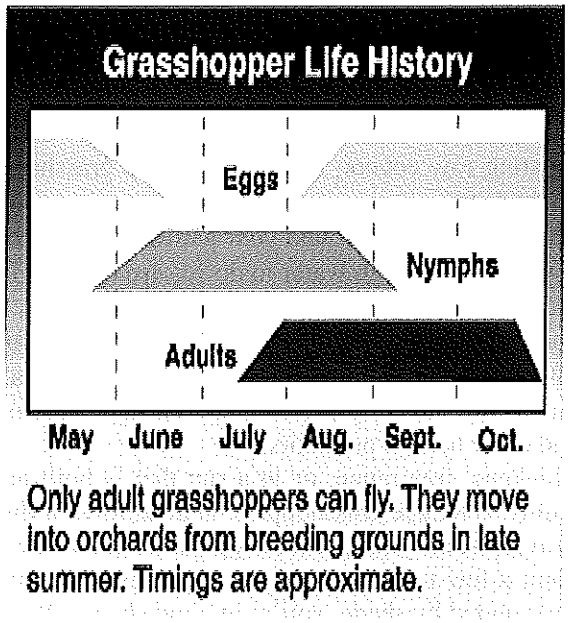

Chart taken from Tree Fruit Research and Extension Center, WSU

Weather is the main determinant in grasshopper population surges. Cold winters will kill many eggs and rainy, wet springs can inhibit the growth of nymphs or kill them. Unfortunately, if you had a lot of grasshoppers last year, our mild winter may not have killed many of the overwintering eggs, leaving you to face even greater hordes this year.

The number of grasshoppers is the key to how much damage they will do. Seven grasshoppers per square yard over 10 acres of rangeland will eat as much as one cow can for a season. Fifteen to 20 per square yard spread over a 40 acre field of alfalfa can eat a ton of hay per day! To estimate your population, select a square yard area ahead of you and count the adult grasshoppers jumping out of the square yard as you walk toward it. Take 18 counts, 15 to 20 paces apart, in the sampling area and average the numbers of grasshoppers. Eight or more adults per square yard are considered economically damaging.**

Is all lost? Should you just let them have the garden, and run for your life, or hang on and hope the cycle swings the other direction next year? I choose hanging in there. Every challenge holds an opportunity to make changes for the better. Observation of the growth cycle will aid you in the timing of your control tactics.

Insecticides and baits are most effective when grasshoppers are young. If you intend to use such products, remember that, whether using a natural or chemical control, you MUST follow the label carefully, both for the sake of environmental and personal health and to ensure the product works effectively. Baits containing Carbaryl, a chemical agent are fairly effective. To use these baits, spread an eight foot border surrounding the area to be

protected. Be aware that this product can affect other animals and insects and that the bait could be spread by rain or sprinkling to nearby water sources.

Neem oil has a low toxicity and is approved for organic use. It is effective against some but not all species of grasshoppers. It must be reapplied every 4-8 days and after rainfall. Neem products include Turplex (for lawn areas,) Azatin (for ornamentals, and Align (for garden crops).

Nosema Locustae is a commercially available biological control, also approved for organic use, that uses the spore of a protozoa mixed with bait which infects the grasshopper that eats the bait and the grasshoppers that cannibalize the dead grasshopper that ate the bait. It will do very little good unless an area of at least 5 acres is treated. However, your neighbors may be happy to give you their cooperation. Nolo Bait Biological and Planet Natural Semaspore are two products you can try.

Insecticidal soaps can kill some species of grasshoppers if sprayed directly on the insects. There is danger to ladybugs and to plant tissue if soaps are used in too strong a solution, making this a less effective method of control.***

Kaolin clay, sprayed on plants as a slurry, may deter grasshoppers from eating your plants, though it won't reduce their numbers.

If grasshopper populations become large over an extensive area, ranchers can initiate a Cooperative Control Program to protect their rangeland. Landowners must meet certain criteria to qualify. Contact the Animal and Plant Health Inspection Service**** or the local USDA service at 509-775-3473 for more information.

For the home gardener, natural and cultural controls can reduce damage to a manageable level. Here are some practices to try:

- Floating row covers, laid down before grasshoppers move in and tacked down closely, will keep them out of your crops.
- Cut a wide swath around your garden. A grasshopper's favorite hang-out is grass, the taller the better.
- If you have enough water to do so, use overhead sprinklers. This will do the same thing as a rainy spring-retard growth of nymphs and discourage grasshoppers from entering the area being sprinkled. Do not overhead water under direct sunlight, though, as it can damage foliage of tender plants.
- Encourage birds by providing houses, feeders, birdbaths, perches, and edible plants like berries. (I have mulberries, nanking cherries, and currants near my vegetables.) Also provide water and cover for toads, snakes, and other natural predators.
- Chickens, free range, or in a run that is built around the perimeter of your garden will amaze you with their ability to reduce grasshoppers. Guinea fowl or ducks work, too.
- Provide some shade. Most vegetables like at least 6 hours of sunlight a day. If yours get more sun than that, plant a few trees. Grasshoppers like full sun and will avoid shady spots. If you garden in a mostly sunny spot surrounded by shade, you're in good shape. Of course, this is a long term strategy.
- Cultivating in the fall will help destroy insect eggs, though it won't stop migrating grasshoppers.
- Praying Mantids are said to catch grasshoppers. (I've tried the other methods listed but not this one, so I can't vouch for its success.)

*jenny.tfrec.wsu.edu
** "Grasshoppers in Washington," Cooperative Extension Bulletin 1392
*** ipm.montana.edu
****www.aphis.usda.gov

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APHIS Factsheet
Plant Protection and Quarantine May 2010

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 (hereafter, referred to collectively as grasshoppers) are natural components of this ecosystem. However, their populations can reach outbreak levels and cause serious economic losses to rangeland forage, especially when accompanied by a drought.

Not all grasshopper species significantly damage rangeland forage, so action to protect rangeland resources is not always required when grasshopper populations increase. However, a rapid and effective response is required when a grasshopper outbreak develops and threatens rangeland forage. During such an event, Federal land management agencies, 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. Under the Plant Protection Act (PPA), APHIS has the authority, subject to funding availability, to treat Federal, State, or private lands that have economically significant infestations of grasshoppers.

Grasshopper and Mormon Cricket Biology

Grasshoppers and Mormon crickets are closely related insects that belong to the Order Orthoptera. Nearly 400 grasshopper species inhabit the 17 Western States involved in APHIS' grasshopper program, but only a small percentage are considered pest species. Anywhere from 15 to 45 species of grasshoppers can be found in a particular rangeland ecosystem, and economic damage usually occurs as a result of grasshoppers increasing in number.

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, thus reducing valuable livestock forage. Other effects of these pests include: soil erosion and degradation, disruption of nutrient cycles, interference with water filtration, and potentially irreversible changes in the flora and fauna of 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 conducts surveys for grasshopper populations on rangeland in the Western United States, provides technical assistance on grasshopper management to landowners and managers, delivers public outreach and education programs, and may cooperatively suppress grasshopper populations when direct intervention is necessary. APHIS treats grasshoppers only upon request and after determining that treatment is warranted. In some cases, APHIS rangeland treatments protect not only the rangeland, but also reduce the likelihood that the grasshoppers will move into crops and other lands that border rangeland.

APHIS surveys grasshopper populations in the following Western States: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. Survey information is used by APHIS and land managers and owners to assess whether treatments may be warranted. Treatment must be requested by a Federal land management agency, State agriculture department, county or local government, private group, and/or individual that has jurisdiction over the land before APHIS can begin to consider a treatment.

Upon request, APHIS would visit the site and assess various factors relevant to the infestation to determine whether action by APHIS is warranted. These factors include, but are not limited to, the pest species, biological stage of the species, timing of the treatment, treatment and chemical options, cost benefits of conducting the action, and ecological considerations. Grasshopper surveys, conducted at certain times of the year, may show the potential for large grasshopper populations. Based on survey results, county, State, and Federal officials and/or rancher groups may initiate early coordination of local programs and request APHIS assistance in a timely and effective cooperative effort.

Cooperative Suppression of Grasshoppers

Federal agencies own or manage approximately 43 percent of the rangeland in the United States. 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 populations or "hot spots" (lands with high densities of egg masses) 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, at the request of Federal land managers, may conduct grasshopper suppression treatments on federally managed rangeland when traditional practices fail to keep populations below economic thresholds. After receiving a land manager's request for grasshopper assistance and assessing the availability of funds, APHIS determines the need for suppression treatments on Federal rangelands.

APHIS is involved with grasshopper suppression treatments on Federal, State, and private rangeland as part of a cost–sharing program established by the PPA. On Federal lands, APHIS pays 100 percent of the treatment cost. On State lands, APHIS provides 50 percent of the funds for treatment and control, and the State provides the remaining 50 percent. On private rangelands, APHIS provides 33 percent of the funding, with the State and/or private landowner paying the remainder of the treatment cost. This cost share is only available if APHIS conducts the suppression treatments. During outbreaks, many grasshopper treatments will be conducted independently from APHIS' program.

APHIS does not have the authority to conduct suppression programs for grasshoppers on private crop lands. However, if small amounts of croplands (typically less than 15 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 APHIS would charge the private crop grower 100 percent of the treatment cost for the treated crops.

APHIS does conduct rangeland treatments in areas where federally administered rangeland is 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 crops, and the crop owner is responsible for any treatments that may be needed.

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 are: 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 RAATs strategy relies on the efficacy of an insecticide to suppress grasshoppers within directly 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.

The insecticides available for used by APHIS in the grasshopper program include carbaryl, diflubenzuron, and malathion. Treatment would consist of a single application of only one of these three. All of these effective insecticides are currently registered for use and labeled by the U.S. Environmental Protection Agency for control of rangeland grasshoppers. The insecticide chosen depends on a number of factors, including: species of grasshopper/Mormon cricket, age of population, climate, weather, forage condition, economics, and environmental risks.

Each of the insecticides is very effective and safe when used properly under the right conditions, and 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 www.aphis.usda.gov, 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/services/report_pest_disease/report_pest_disease.shtml.