

By Jeffrey Bradshaw

Extension Entomologist

The risk of grasshopper infestation in western Nebraska rangelands was low in 2012 and is expected to be low again in 2013, with some spotty exceptions. In fact, most of the western United States is projected to have low numbers with only Nebraska having any potential for spotty problems.

Grasshopper numbers are responsive to environmental conditions; however, species differ in their response to precipitation, plant communities, soil characteristics, and microclimate. A wet spring and rains during grasshopper hatching and development (mid-May to June) improve rangeland forage quality and reduces losses from grasshopper infestation. Our current wet, cool weather may function to reduce grasshopper numbers further. However, ranchers and range managers should maintain vigilance to monitor grasshopper densities during hatching periods.

The risk category in 2013 is based on 2012 surveys conducted by the USDA Animal and Plant Health Inspection Service. Numbers of adult grasshoppers last year are an index of the number of eggs laid, which is the overwintering stage of the most damaging species. Most grasshopper species are not considered rangeland pests and many have been shown to increase plant production under certain circumstances.

Of the over 100 grasshopper species in Nebraska, three species may be of concern for 2013—*Ageneotettix deorum*, *Amphitornus coloradus*, and *Opeia obscura*. They represent 47.8 percent, 10.9 percent, and 8.2 percent of the total adult numbers from 2012, respectively. Ranchers should look for elevated numbers of these species. A fourth species of concern, *A. deorum*, is the only species to consistently make up a majority of the range-destructive grasshopper community since 2005.

The potential for high grasshopper density will be determined largely by two factors:

- **Food Availability.** Immediately after grasshoppers hatch from their eggs, they have few fat reserves and are vulnerable to cool, wet weather. If they can't feed readily during these early stages, high mortality will result. Since grasshoppers hatch over an extended period, only some of the hatch may be affected; however, this mortality can be significant enough to reduce heavy populations below threshold levels in many areas.

Grasshoppers feed based on the need for a limiting nutrient, mainly nitrogen, and can compensate by supplementary feeding on a plant with high nutrient content. Proper range management practices are key, as grasshopper densities can increase significantly on disturbed rangeland as a result of overgrazing.

Additionally, the length of time since overgrazing and disturbance affects grasshopper feeding preference. Early hatching species are often better able to survive on disturbed rangeland because annual plants are dominant during the spring, while perennial grasses are more suited for sustaining populations later in the year.

- **Rainfall.** In areas with ample rainfall, especially in mid-May, fewer problems will develop due to increased grass growth resulting in less pressure for grass. Additionally, wet weather improves conditions for pathogens (e.g., fungi) that attack grasshoppers.

Dry conditions that limit grass growth and depress insect pathogens result in a greater value for the available forage and a greater need to manage grasshopper populations. Healthier, more vigorous grass growth leads to fewer grasshopper problems. Additionally, bare soil improves conditions for oviposition (egg laying), and may result in higher populations the following year.

Reduced Agent/Area Treatments

If grasshopper populations readily persist through the early hatching period and dry conditions limit grass growth, there likely will be widespread areas with serious grasshopper infestations, and control may need to be considered.

The recommended control method for rangeland grasshoppers is reduced agent/area treatment (RAAT) program. The RAATs program has been widely used and ranchers have been satisfied with the control levels they've seen.

RAATs consists of spraying a swath and leaving a swath untreated so that only half the treatment block is sprayed, reducing treatment costs. Any of the three insecticides registered for rangeland grasshopper control can be used, but Dimilin has been used almost exclusively with this program in Nebraska. The longer residual of Dimilin (21-28 days) allows time for grasshoppers to move from the untreated areas into the treated area and contact the insecticide.

The overall effectiveness of control may be reduced slightly with this method, but the cost will be reduced by 50 percent or more. A major cost determinant for using RAATs is the size of the treatment block—larger blocks are much more efficient for applicators to treat. If treatments are warranted, ranchers are urged to work together to treat larger areas to increase the efficiency and reduce the cost of treatments.

This year I and David Boxler, Extension Educator at the West Central Research and Extension Center, are collaborating with USDA-APHIS to conduct field-scale trials of Dupont™ Prevathon™, a newly labeled grasshopper control product for range. Our aim is to evaluate its suitability for use within the Grasshopper and Mormon Cricket Suppression Program. As we evaluate the results of these efforts with USDA-APHIS, we will be sure to keep you informed.

More on Grasshoppers

For more information on grasshoppers and their management, visit <http://entomology.unl.edu/grasshoppers/>. Grasshoppers of Nebraska, a 140-page UNL Extension book available in print and online, includes photos and an identification guide for grasshopper species found in Nebraska