

Adult grasshopper numbers decreased in 2011 in western Nebraska rangelands, despite a high risk of grasshopper infestation. Subsequently, the odds are lower for 2012 outbreaks in many areas, according to several University of Nebraska-Lincoln Extension entomology experts.

Average adult grasshopper numbers (per square yard) dropped from 17.8 in 2010 to 15.6 in 2011. Grasshopper numbers respond to environmental conditions; however, species respond differently to precipitation, plant communities, soil characteristics and microclimate, said Sean Whipple, postdoctoral research associate at UNL's Panhandle Research and Extension Center in Scottsbluff.

A wet spring and rains from mid-May through June, when many grasshoppers hatch and develop, improves rangeland forage quality, reducing the loss from grasshopper infestation. He noted that ranchers and range managers should be prepared to monitor grasshopper densities from mid-May through June.

The 2012 risk category is based on 2011 surveys conducted by the U.S. Department of Agriculture's 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, said Bob Wright, entomologist in the university's Institute of Agriculture and Natural Resources.

Whipple adds that most grasshopper species are not considered rangeland pests, and many increase plant production under certain circumstances.

Of the more than 100 grasshopper species present in Nebraska, species of concern for 2012 include *Ageneotettix deorum*, *Phoetaliotes nebrascensis*, and *Melanoplus angustipennis*, which comprised 30 percent, 11.5 percent and 7.9 percent of the total adult numbers from 2011, respectively. Ranchers should look for elevated numbers of these species.

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

- **Food availability:** Immediately after grasshoppers hatch, they have few fat reserves and are vulnerable to cool, wet weather. If they can't feed readily, 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.

Proper range management practices are key, as overgrazing can cause grasshopper densities to increase significantly on disturbed rangeland.

Also, the amount 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 materialize because of the increased grass growth, resulting in less pressure for grass.

Also, 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 equals fewer grasshopper problems, and bare soil improves conditions for egg laying, and may result in higher populations the following year.

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, said Jeff Bradshaw, entomologist at UNL's Panhandle Research and Extension Center.

Bradshaw recommends control with the reduced agent/area treatments, or RAATs, program. The RAATs program has been widely used and ranchers have been very 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.

Bradshaw said 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.

For more information visit <http://entomology.unl.edu/grasshoppers/>.