Ground Squirrels: Pests that can be controlled

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MSU photo - Carolyn Nistler

A study recently completed by the Extension Wildlife Program at Montana State University indicates that the significance of Richardson's ground squirrel damage and the ability to control them is much greater than originally thought. Alfalfa loss alone could be as great as $7 million annually. Fortunately, the study also concluded that ground squirrel damage can be greatly reduced or eliminated using the proper toxicants at the proper time with the proper techniques.

Maximum alfalfa production in Montana has always been limited by ground squirrel activity. The ground squirrel (Spermophilus richardson and S. columbianus) is a medium-sized burrowing rodent, larger than a pocket gopher, but smaller than a prairie dog. They occupy sagebrush, grassland and cropland, and can limit maximum vegetative production in these areas. Ground squirrels invade alfalfa fields and establish elaborate burrow systems, resulting in forage loss caused by burrowing and feeding.

Montana State University County Extension Agents indicated that crop damage from ground squirrels has a major economic impact on agriculture producers in Montana, although actual damage is difficult to quantify. While research from Montana is limited, findings have shown that a single pair of ground squirrels and their offspring can remove 0.25 acre of alfalfa in one growing season. In northeastern California, percentage alfalfa yield loss estimates ranged from 34.6 to 45.9% due to ground squirrels.

Alfalfa is the nation's fourth largest commodity and Montana has more alfalfa acreage than any other state in the country. In spring of 2003, nearly 700 alfalfa producers were surveyed throughout Montana to determine perceived alfalfa losses due to ground squirrels. About 290 surveys were returned (41%) and results were tabulated in fall 2003.

Survey responses indicated the average alfalfa producer in Montana has 370 acres planted in alfalfa hay and produces 2.7 tons per acre on these lands. Respondents estimated that ground squirrels occupy, on average, 27% of hayland, resulting in a 17% decrease of alfalfa production. This represents an average annual loss of 17 acres of alfalfa, or 47 tons of alfalfa or $3500 (at $75/ton) per producer. If these estimates are correct, losses in Montana may be as great as $7 million annually.

Responses varied by region. According to the survey, economic loss is greatest in northeast Montana (13.2%) where habitat is abundant, and least in northwest Montana (2.4%) where habitat is limited. Ground squirrels are not known to occupy southeast Montana. The highest response region (32%) was central Montana, the region within our survey area, which produces the most (29%) of Montana's alfalfa. Over 105,000 acres of alfalfa in Montana were accounted for based on survey results. This represents 8% of the total alfalfa within the survey area.

In addition to getting estimates from landowners on perceived crop loss, researchers gathered data on a farm in Central Park, Montana to determine actual vegetative loss. Three 3'x3' exclosures were erected prior to spring green up in areas of high, moderate and low ground squirrel occupancy. Yield loss was determined by clipping six plots prior to the first alfalfa cutting—three located within the exclosures and three in unprotected areas of similar ground squirrel density. Alfalfa samples were dried and weighed at the MSU Animal Nutrition Center in June 2003. Results indicated ground squirrels decreased alfalfa production there by 14 to 48%.

Although the few samples collected in Gallatin County are probably not representative of ground squirrel impact throughout the state, they may be an indication that actual damage due to ground squirrels might be higher than producers perceive.

The MSU Extension Wildlife Program is continuing ongoing research to establish economic and technical guidelines for control of ground squirrels. Various methods—including zinc phosphide, Rozol, Phostoxin and Ramik Green in bait stations, and trapping—were tested and compared to an untreated control area. Although testing is continuing, following are some preliminary recommendations.

Best control was achieved using the anticoagulant bait Rozol according to label directions which includes two treatments two days apart. Equally important was conducting the treatment early in spring, about three weeks after ground squirrels have emerged from hibernation. In a project at the Ft. Ellis Experiment Station, using Rozol followed by placing bait stations filled with Ramik Green, we achieved 95-100% control in an extremely infested area.

Using bait stations prevents reinfestation of controlled areas from surrounding areas where populations still exist. Inverted T's constructed of 3 or 4 inch PVC pipe make effective bait stations. The upright, long part of the T is filled with Ramik Green and capped. When the bait station is wired to a post, the ground squirrels will enter the ends to get the bait. Because Ramik Green is a slow acting anticoagulant bait, more than one feeding is necessary, so it is important to keep the stations full. Space the stations no more than 200 feet apart.