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The Thirteen-Lined Ground Squirrel: Controlling Damage

This NebGuide describes the physical characteristics, habits and management of the thirteen-lined ground squirrel.

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Description

Thirteen-lined ground squirrels (*Spermophilus tridecemlineatus*) are common throughout the Great Plains. They have many common names such as "thirteen-liner" or "striped gopher." "Gopher" is a misnomer because true (pocket) gophers (*Geomys bursarius* and *Thomomys talpoides*) belong to another family of rodents.

Figure 1. Thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*)

True to its name, the thirteen-lined ground squirrel has thirteen light stripes with rows of light spots that run the length of its back (*Figure 1*). The background color is tan or

brown and the belly is white. Its color pattern blends into its surroundings, protecting it from predators. Thirteen-lined ground squirrels are usually about 11 inches long, including a 5- to 6-inch tail. Adults weigh 4 to 5 ounces in the spring but gain considerable weight in the fall as they prepare for winter hibernation. Their call, a high-pitched trill, sounds like a bird call, but is unmistakable to the trained ear.

Thirteen-lined ground squirrels are members of the squirrel family which includes chipmunks, ground squirrels, tree squirrels, prairie dogs, and woodchucks. Three other species of ground squirrels live in Nebraska, but are relatively uncommon. Franklin's ground squirrel (*Spermophilus franklinii*) is the largest in Nebraska, averaging 10 inches in combined head and body length. It occurs primarily in tall grass prairies and abandoned fields in the eastern half of the state. Spotted ground squirrels (*Spermophilus spilosoma*) are the smallest of the ground squirrels, averaging only 5 to 6 inches in combined head and body length. They have faint white spots scattered across their backs and are found in western Nebraska in the short grass prairie and Sandhills. Wyoming ground squirrels (*Spermophilus elegans*) are the least common ground squirrel in Nebraska and are found only in the southwestern Panhandle.

General Biology

The "thirteen-liner" is Nebraska's most common ground squirrel. It is most often seen during the day in golf courses, cemeteries, parks, yards, and other open areas with closely mowed vegetation. It prefers mowed grassy areas and avoids tall vegetation. Agricultural and residential development have actually increased the range of the thirteen-lined ground squirrel in the Great Plains.

Thirteen-lined ground squirrels dig burrows that are 15 to 20 feet long and often have more than one entrance. Escape burrows are shorter and have only one entrance. The burrow entrances are inconspicuous, appearing only as small, 2-inch diameter holes in the ground. Mounds are seldom present at the burrow entrances, but occasionally the grass will appear well worn. Burrow entrances often are plugged at night.

To avoid cold weather, thirteen-lined ground squirrels hibernate in their burrows. They go into their burrows in October and don't emerge until late March or early April. Mating occurs shortly thereafter.

One litter of seven to 10 young is usually produced in May each year. The young are born after a 28-day gestation period and are capable of leaving their burrows at 6 weeks of age.

Thirteen-lined ground squirrels are usually solitary although they do congregate in loosely structured colonies. In some areas, their densities may reach 10 or more animals per acre. Their home ranges extend from three to 10 acres.

Thirteen-lined ground squirrels feed primarily on seeds, garden vegetables, flowers, and insects. The scientific name "*Spermophilus*," meaning seed lover, is quite appropriate. They feed on seeds throughout their active season, especially in fall when ground squirrels prepare for hibernation. Insects provide an excellent source of protein, and during the summer may make up half of their regular diet.

Economic Significance

Thirteen-lined ground squirrels can cause problems when they create burrows in lawns, golf courses, cemeteries, parks, and earthen dikes. They also dig up newly planted seeds, consume sprouting seeds, and damage garden vegetables. In addition, thirteen-lined ground squirrels and other rodents cause an estimated \$2 million damage each year to Nebraska cornfields.

"Thirteen-liners" are native to Nebraska and are prey to several predators, including badgers, coyotes, hawks, weasels, and a variety of snakes. They benefit people directly by feeding on many harmful weeds, weed seeds, and insects. They also provide people enjoyable opportunities to view wildlife with family and friends. We should not attempt to eliminate these ground squirrels, but rather, should manage their populations at levels where they can be appreciated.

Prevention and Control Methods

The methods you select to prevent and control damage depend on the type and extent of damage and the nature of the site. It is best to use an integrated approach that includes several methods.

Fencing

A fence made of 1/2-inch wire mesh or sheet metal will help keep ground squirrels, rabbits, and other problem animals out of gardens and flowerbeds. The fence should be at least 18 inches high and buried 6 inches. Persistent ground squirrels have been known to climb over and dig under fences to reach highly preferred foods.

Cultural

One of the best ways to discourage ground squirrel activity is to allow grasses and other vegetation to grow tall and dense in areas such as roadside ditches, field edges, earthen dams, and pastures. Residents next to areas with many ground squirrels can deter them by establishing tall, dense plantings of shrubs, tall grass, or flowers around the borders of their property. Ground squirrels are not discouraged by blocking their entrances with soil, rocks, or other materials.

You can disrupt ground squirrel habitat in gardens and row crops by cultivating the soil early in spring and continuing the practice throughout the season. Reduce seed and seedling consumption by planting cold-tolerant varieties in March or early April, before ground squirrels emerge from hibernation.

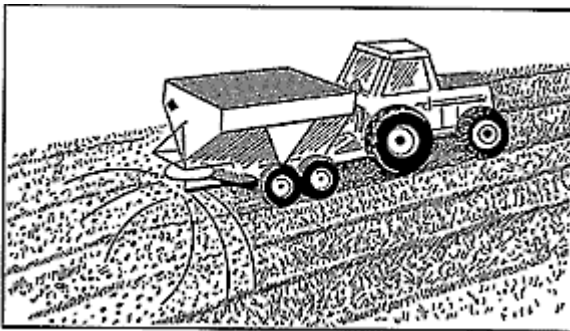


Figure 2. At planting, broadcast four bushels of cracked corn per acre over the outside four to eight rows adjacent to ground squirrel habitat.

Deter ground squirrels and other small mammals from feeding on crop seeds and seedlings by providing them with an alternative food source. At planting, broadcast four bushels of cracked corn per acre over the outside four to eight rows adjacent to ground squirrel habitat (Figure 2). It also may be necessary to spot treat fields

in areas where damage is expected or observed, especially if conservation tillage is employed.

Repellents

Repellents such as mothballs and dried blood meal have had limited success in controlling ground squirrels and are not usually recommended. There are no seed-treatment repellents registered for the control of ground squirrels.

Toxicants

Two toxicants, zinc phosphide and strychnine, are registered for ground squirrel control. They are economical to use when large areas and several ground squirrels are to be treated. Both are *Restricted Use pesticides*, so you must be a Certified pesticide Applicator to buy and apply them.

Zinc phosphide and strychnine are formulated as pellets or grain baits and are most effective in spring and late summer when ground squirrels are actively gathering seeds. Place a tablespoon of toxic bait directly into each burrow, below ground, to keep it away from poultry, game birds, and other wildlife. Do not place toxic baits in tall grasses where ground squirrels may not find them or on bare ground where they may attract other animals. Always read and follow label recommendations.

Burrow fumigants such as aluminum phosphide tablets and gas cartridges are effective when small areas are to be treated. Aluminum phosphide is a *Restricted Use pesticide*, while most gas cartridges are *General Use pesticides*. Fumigation may be the most humane method in the spring, if control is really needed, because both female ground squirrels and their dependent young are present in the burrows from mid-April to mid-June. Aluminum phosphide tablets release toxic phosphine gas when they contact moisture in the burrow. Roll the tablets deep into the burrow and plug the burrow with soil or sod to create an airtight seal. Aluminum phosphide should not be used in or near buildings that are occupied by humans, livestock, or pets.

Gas cartridges release carbon monoxide, carbon dioxide, and other noxious gases when they are burned. The burrow entrances of thirteen-lined ground squirrels, however, are too small to easily accommodate some of these cartridges.

Trapping

Several types of traps are effective for ground squirrels. Lethal traps include steel-jawed (#0 and #1) and wooden snap-type rat traps. The latter are preferred because they are readily available, inexpensive, and easier to set than steel-jawed traps.

Place traps out for two to three days before setting them and use several types of baits to determine ground squirrel food preferences. Try using peanut butter, peanut butter mixed with oatmeal, nuts, grains, or whatever food the ground squirrels have been eating. Secure solid baits to the trigger with thread or wire.

During early summer, when young ground squirrels are present, use the smaller wooden mouse traps. Place traps near burrow entrances or along runways and check them frequently. Wear gloves when removing trapped ground squirrels. Notify neighbors (especially parents and pet owners) of any trapping activities. To reduce the risk of capturing animals other than ground squirrels, place traps underneath boxes that have 2-inch diameter holes cut in the ends.

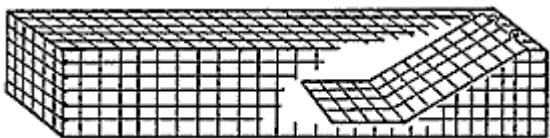


Figure 3. A burrow-entrance live trap can easily be constructed from rigid welded wire mesh.

Live traps can best be used when you wish to capture and release animals unharmed. A simple live trap can be made using a 12-inch by 20-inch piece of 1/2-inch mesh hardware cloth (*Figure 3*). Bend the hardware cloth to form the rectangular body of the trap with 3-inch openings on either end. Secure the free edges with hog rings or wire. Cover one of the open ends with a 3-inch square piece of hardware cloth. Make a trap door at the opposite end by using a 2 3/4-inch by 8-inch piece of hardware cloth. Attach this piece to the top of the trap, recessed about 1/2 inch, and make sure it can swing freely.

A live trap is most successful when it is placed into a burrow that an animal has recently entered. Wedge the trap opening into the burrow entrance and support the opposite end of the live trap with soil or a block of wood. Often, within five minutes, the ground squirrel will climb out of the burrow, under the trap door, and into the trap. Plug any holes within 20 feet with soil to reduce the chances of escape. Check traps often to avoid undue stress on captured animals. Captured animals can be released unharmed in sites with suitable habitat where no additional damage problems can occur, or they can be euthanized with carbon dioxide gas.

Ground squirrel burrows can be flooded with water to encourage them to enter live traps more quickly. Don't flood burrow systems adjacent to your home--you may flood your basement. A snare made of monofilament line also can be used to catch a ground squirrel when it emerges from a burrow.

Shooting

Small populations of ground squirrels can be controlled by shooting. A .22 caliber rifle or .17 caliber "air rifle" is adequate. Local laws may prohibit use of firearms in residential or urban areas. Always use firearms safely.

Your local University of Nebraska Cooperative Extension office can provide a wide range of information on prevention and control of wildlife damage. Private pest control operators may provide wildlife damage control materials and services. In addition, you can buy toxicants and other materials from USDA-APHIS-Division of Animal Damage Control in Nebraska (402/434-2340).

File G1110 under: WILDLIFE MANAGEMENT

A-21, Wildlife Damage Control

Issued December 1992; 10,000 printed.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Elbert C. Dickey, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

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