



Controlling Townsend Ground Squirrels in Beaver County, Utah

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Townsend Ground Squirrel

The Townsend Ground Squirrel (*Spermophilus townsendi*) is a small gray squirrel found in Nevada and western Utah. It eats grasses, alfalfa and other agronomic crops. Adults may be up to 7 inches long with a short bi-colored tail about 2 inches in length. The belly and flanks are mostly white.

Townsend ground squirrels live in colonies and construct underground burrows that have a number of entrances. The burrows may be up to 6 feet deep. The squirrels generally enter their burrows to aestivate, escaping the late summer heat. Aestivation is a period of sleep where animals go dormant to escape summer heat. They hibernate during the coldest part of the winter. Males usually become active above ground 1 to 2 weeks before the females in the spring, sometimes as early as late February or early March. A few may be active above ground throughout the year. Breeding occurs immediately after hibernation. The young are born after

a 4-to 5-week gestation period with 2 to 10 young per litter. Generally only one litter is produced each year. Densities of the ground squirrel populations can range from 2 to 20 or more per acre.

Damage and Control Methods

High populations of ground squirrels can compete with livestock for forage; destroy alfalfa crops, golf courses, and lawns; and can be reservoirs for diseases such as plague. Their burrowing activities can weaken and collapse ditch banks and canals, undermine foundations, and alter irrigation systems. Burrow mounds not only cover and kill vegetation, but damage haying machinery. Ground squirrels in Utah are not a protected species. However, before initiating any lethal control measures consult with your USU County Extension Agent. This fact sheet discusses some alternative methods that can be used to control Townsend Ground Squirrels in Utah.

Fumigants, Trapping, and Shooting

For years farmers have used many different methods to try to control the Townsend Ground Squirrel. When most of the area was irrigated by flooding, the numbers of squirrels were fairly small and could be treated by using methods such as fumigants, trapping and shooting. Now the ground squirrels are infesting entire fields instead of just making their burrows around the edge of the fields. These methods are effective but are very time consuming. Fumigants must be used in every hole and most burrow systems have many holes. The same is true with trapping. Shooting may provide relief from ground squirrels where colonies are small but has done little to control the current numbers in western Beaver County.

Toxicants

In Beaver County producers are encouraged to try a new baiting program. This program consists of pre-baiting with a crimped oat and then following up several days later with grain bait containing zinc phosphide. This control program has several advantages over other treatments.



Producer apply pre-bait using a 4-wheeler

These advantages include:

- 1) Squirrels are much more likely to eat and develop a taste for the grain bait if they are provided an untreated grain pre-bait shortly after they emerge from hibernation and prior to vegetation green-up.
- 2) Both pre-bait and bait can be applied quickly using a spreader on a four-wheeler compared to other methods where each hole must be treated individually.
- 3) By applying the bait when adults emerge from hibernation, the breeding population can be targeted, thus preventing reproduction.

Safety/Regulations

Zinc phosphide is currently registered for ground squirrel control in Utah. Check with your County Extension Office for a list of available products and use restrictions. Zinc phosphide is a restricted pesticide in the state of Utah so one must have a pesticide license in order to purchase the bait. Because zinc phosphide can be absorbed in small amounts through the skin, rubber gloves should be worn when handling the bait. Zinc phosphide has been used for several years to control ground squirrels. It is a single-dose toxicant that when used properly can result in mortality rates as high as 85% to 90%. However, if the animals do not consume enough bait for mortality to occur, they become sick, and will associate their illness with the bait. Thus, they will be reluctant to eat the bait in the future. If this happens, repeated baiting with the same bait formulations during the same year will not be successful.

Pre-baiting may increase bait acceptance with treated grain baits. Pre-baiting means exposing squirrels to

untreated grain bait several days before using toxic grain. Conditioning the squirrels to eating this new food improves the likelihood of their eating a lethal dose of toxic grain. Pre-baiting often improves bait acceptance and, therefore, control. The pre-bait must be the same grain that will be used as bait.

Use only fresh bait. If zinc phosphide baits are more than a few months old they should not be used, particularly if they have not been stored in air-tight, sealed containers. They decompose from the humidity in the air. If the bait gets rained on or covered with dirt it must be reapplied.

When to Bait

Baiting should not begin until the entire population is active. This usually occurs 2 to 3 weeks after the first adults appear. Baiting works best when it is applied before the alfalfa and other crops start to green up. Once green-up begins, it is difficult to get the squirrels to eat the bait. The pre-bait and bait should be applied next to the active burrows.

Bait Placement

Bait placement is also critical. Ground squirrels are accustomed to foraging above ground for their food and are suspicious of anything placed in their tunnel systems. Thus pre-baits and baits should be scattered near each active burrow as specified on the bait label. All active burrows must be baited. Incomplete coverage of the colony will result in poor control success.

Ground Squirrel Control Trial

To demonstrate to producers the effectiveness of the pre-baiting, we established trials to compare the effects of no baiting, baiting and pre-baiting. To establish these trials, we worked with four different producers to set up plots within their fields.



We selected 12 plots, three in each producer's field. Each plot was 50 X 50 m and at least 400 meters from each other. Each treatment consisted of one plot that was pre-baited and then baited with zinc phosphide, one plot baited with zinc phosphide

without pre-baiting and one plot that received no treatments. The plots were randomly assigned to treatment and controls. Each plot was observed for 3 days before treatment and 3 days after treatment to determine if the number of squirrels decreased. The plots were pre-baited with crimped oats using a hand spreader. The bait was spread using the same spreader. The trial was conducted over a 2 year period establishing four new plots each year.

Results

In 2009, the plots that were treated with bait only, showed an average reduction of squirrels from 8.3 to 3.4 which represent 59% control. In 2010 the bait only plots showed a continued reduction going from 6.3 squirrels to 3.3 which represents 52%.

The 2009 plots that were pre-baited and then baited showed an average reduction of squirrels from 10.7 to 2.7 which represent 75% control. The 2010 plots which were pre-baited and then baited showed an average reduction of squirrels from 6.9 to 2.3 which represent 66% control.

The control plots with no treatment still showed a reduction of ground squirrels from 5.4 to 3.6 which represent 32.5% control in 2009 and 6.3 to 4.3 which represent 32.5% in 2010. This reduction in the number of squirrels in the control plots may be from farmers baiting and shooting the squirrels in the fields near the plots during the trial period.

	Before Treatment	After Treatment	% Change Per Year	Average Change
Control 2009	5.4 squirrels	3.6 squirrels	33%	32.5%
Control 2010	6.3 squirrels	4.3 squirrels	32%	
Bait Only 2009	8.3 squirrels	3.4 squirrels	59%	55.5%
Bait Only 2010	6.3 squirrels	3.3 squirrels	52%	
Bait & Pre-bait 2009	10.7 squirrels	2.7 squirrels	75%	71%
Bait & Pre-bait 2010	6.9 squirrels	2.3 squirrels	66%	

Conclusion

In both 2009 and 2010 fewer ground squirrels were observed on the treatment sites than the untreated sites. The treatment sites that were pre-baited exhibited the greatest reduction in ground squirrel numbers after baiting. These observations support the premise that the use of pre-baiting as part of an integrated ground squirrel damage control program using zinc phosphide resulted in a greater reduction of the population than baiting alone. This education program has helped many farmers save money by reducing the number of squirrels that are eating their crops. As in many agricultural situations, we have found that if a good job of controlling the pest is performed and the neighbor does not, then the problem will move from the neighbors' fields to the well controlled fields. This is similar to the problem with noxious weeds. In this project we have worked to educate all the farmers in the area on the importance of controlling the ground squirrel. The majority of farmers are implementing a control program. In order to significantly reduce the number of squirrels in the entire affected area, all the producers will need to make this a priority.

References

- Messmer, T., Nelson, M. 2009. Managing damage caused by Town Ground Squirrels in Utah. Beaver, Utah.
- Managing Richardson's Ground Squirrels. 2007. Alberta.ca>Agriculture and Rural Development. [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex_3471](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex_3471).
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