

Non chemical control of Richardson's and Columbian ground squirrels

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Because ground squirrels are primarily meadow and grassland rodents, farms can provide habitat for them. Unused portions of the farm often provide a reservoir of ground squirrels which lead to problems when dispersing juveniles set up housekeeping in garden areas. Damage from ground squirrels results from both their feeding and burrow digging activity.

More than a dozen species of ground squirrels reside in the U.S. This article covers the Richardson's ground squirrel found in areas east of the Rocky Mountains and the Columbian ground squirrel which occurs in the west areas.

Ground squirrels primarily eat grasses, forbs and seeds. Ground squirrels live in extensive underground burrows with many entrances. Ground squirrels hibernate during the winter, but they store large quantities of food in burrow caches. Males become active in early spring, one to two weeks before females. Breeding takes place immediately after females emerge from their burrows. After a 28 day gestation period, 2-14 young are born. Densities of ground squirrels can range from two to 20 or more per acre. Ground squirrels begin hibernation early with some species in drier areas going into hibernation in August. Timing of emergence from hibernation is very important in developing optimum control strategies.

It is important to know the difference between ground squirrels and pocket gophers which are found throughout most of the same range. Ground squirrels look like squirrels, and pocket gophers have cheek pouches, external incisors and look more like short-tailed rats. Although these two species look very different, there is some confusion because ground squirrels are sometimes called "gophers." Pocket gophers spend 99 percent of their life underground feeding on roots and tubers. Ground squirrels feed above ground. Pocket gophers **plug** their tunnel entry tightly with soil. Ground squirrels have an **open** entrance to their tunnel system.



Ground squirrels are not protected in most states. Some species or subspecies, however are protected in some areas. For example, the Northern and Southern Idaho ground squirrels are a Species of Concern. Iowa, Pennsylvania and Missouri require special permits before controlling ground squirrels. Always check with your state wildlife agency before implementing control programs.

Ground squirrels are prey for many predators from coyotes and snakes to hawks, owls and weasels. However predators do not control ground squirrel populations.

Extent of Control

Farmers often ask if they should try to reduce the ground squirrel population or if they should try to eliminate it. It makes more economic sense to eliminate the population. Ground squirrels, with an average litter size of 10 and a maturity age of about 10 months, are very productive. One female has the potential to have offspring resulting in over 100 progeny in just 3 years. Luckily the juvenile mortality rate is about 85%. Most of this mortality occurs in late summer when the mother drives her offspring out of her burrow. They die of exposure, starvation, predation, etc. If a population is just *reduced*, the multitude of burrows available results in extremely high juvenile survival and any reduction in population is immediately offset. The extra effort to eliminate the local population will result in less chance of reinfestation.

However, if neighboring property does not have a ground squirrel control program, farmers can expect to have a continual reinfestation as adjacent colonies redistribute when juveniles disperse.

Habitat Modification

Because of the above mentioned dispersal behaviors of ground squirrels, it is valuable to deep plow to cover burrows after control programs are completed. The ground should be revegetated and the area will be less likely to attract disseminating young animals.

Repellents and Frightening Devices

Repellents are not effective for managing damage by ground squirrels.

Ultrasonic devices have not proven to control, disturb or displace ground squirrels when tested in unbiased research trials.

Trapping

Trapping is an effective way to manage individual or small populations of ground squirrels. For most organic farmers this may be the most practical method of control. Body-gripping (also known as Conibear®) traps can be placed over the hole. All entrances to a burrow system should be covered. Several to dozens of the No. 110 size traps should be used so trapping can begin on one side of the colony and progress across the area. The traps should be staked to prevent scavengers from dragging them off. Body-gripping traps are available from hardware stores or there are many sources available online.



Timing of ground squirrel control is very important. Timing may be the most critical factor effecting success. Early spring is the target period for control. Control measures prior to the birth and emergence of young ground squirrels will be much more efficient.

Cage or box live traps can sometimes be used to remove a very small number of ground squirrels. The small 5 X 5 X18-inch traps work well. They are available from various on-line sources. Bait with nutty peanut butter. After a successful capture, people often desire to release the animal at a distant location. Research has shown this may not be a desirable nor humane option. If a ground squirrel is released, it will normally try to return to its home. They almost always die of exposure, starvation, predation, etc. Putting it with an existing colony will be futile because the resident animals will drive it away. The author recommends drowning as a convenient and safe way of disposing of live-trapped ground squirrels.

Other Methods

Shooting ground squirrels is seldom an effective method of control. Although it may be an enjoyable recreational activity for some people, shooting is expensive, time-consuming and the animals quickly become extremely cautious. At best, shooting reduces the population only until late summer when juveniles will repopulate the vacated burrows.

Propane exploding devices have been advertised to control ground squirrels. These injecting devices are meant to fill the burrow system with a mixture of propane and oxygen, which is ignited to kill the rodents. The resulting explosion is certainly significant and some operators have reported some degree of control. Because the devices are expensive, it is usually difficult to demonstrate they are an economically efficient method of ground squirrel control. Caution must also be taken if underground utilities might be present. There is also some question of whether propane gas is acceptable in an organic farming context.

Other methods have been proposed to control ground squirrels. **Flooding** the tunnel system with water from a hose will sometimes force the squirrel from a burrow if the burrow system is not extensive and soils are heavy. Avoid flooding burrows that are adjacent to foundations or structures that may be damaged by water. **Gumballs** have been reported to clog the intestinal track of ground squirrels. Most of the claims are antidotal and although individual ground squirrels may nibble on gumballs there is no evidence populations will consume enough to result in reliable control.

Acknowledgments

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