

## Non chemical control of pocket gophers

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Pocket gophers are the burrowing rodents that leave soil mounds on the surface of the ground. Often confused with ground squirrels (often called “gophers”) and other small mammals, pocket gophers can be distinguished by their telltale signs as well as by their appearance.

Unlike ground squirrels, which have open holes leading to their tunnel system and are often seen outside their holes, pocket gophers spend almost all their time in their sealed tunnel systems. The mounds they create are usually fan shaped, and tunnel entrances are plugged, keeping intruders out of burrows.



Damage caused by pocket gophers includes destruction of underground utility cables and irrigation pipe; direct consumption and smothering of forage by earthen mounds; and change in species composition on rangelands by providing seedbeds (mounds) for invading annual plants. Research has shown that pocket gophers can reduce dry land yields by almost 50%. Pocket gophers damage trees by stem girdling and clipping, root pruning and possibly root exposure caused by burrowing. Gopher mounds dull and plug the sickle bars used in harvesting hay or alfalfa, and soil brought to the surface as mounds is more likely to erode. In irrigated areas, gopher tunnels can divert water, causing loss of surface irrigation water. Pocket gopher tunnels in ditch banks and earthen banks can hasten soil erosion and water loss.

Litter sizes range from 1 to 10, but average 3 to 4. In some portions of their range where two litters are born each year, litter size is usually smaller, averaging about two.

The breeding season also varies, but births typically occur from March through June. The gestation period is 18 to 19 days.

Densities reported for various pocket gophers are highly variable. Densities of 6 to 8 per acre are considered high density. Average life span of gophers appears to change inversely with population density.

Many predators eat pocket gophers. These predators include weasels, coyotes, and several snakes including bull, and rattlesnakes.

Pocket gophers are not usually protected but always consult with your state wildlife agency before implementing a control program.

### **Identification**

Pocket gophers are burrowing rodents, so named because they have fur-lined cheek pouches outside of the mouth, one on each side of the face. These pockets, which can be turned inside out, are used to carry food. Pocket gophers are powerfully built in the forequarters and have a short neck. The head is fairly small and flattened. The forepaws are large-clawed. Gophers have small external ears, small eyes, and lips that close behind their large incisors: all adaptations to their underground existence.



The pocket gopher's tail is sparsely haired and serves as a sensory mechanism that guides it while moving backwards through its tunnel system. The whiskers on its face are also sensitive, and help it to travel about in its darkened tunnel.

Pocket gophers are medium-sized rodents ranging from about five to nearly 10 inches long (head and body). Adult males are larger than adult females. Their fur is fine and soft, and highly variable in color. Colors range from nearly black, to pale brown, to almost white. This great variability in size and color is attributed to adaptations to local conditions that result from a low dispersal rate which limits gene flow.

### **Habitat**

Pocket gophers occupy a wide variety of habitats. They occur from low coastal areas to elevations above 12,000 feet. They are also found in a wide variety of soil types and conditions, reaching their greatest densities on fertile, light-textured soils with vegetation, especially when that vegetation has large, fleshy roots, bulbs, tubers or other underground structures.

Soil depth and texture are important to the presence or absence of gophers. Tunnels are deeper in sandy soils where soil moisture is sufficient to maintain the integrity of the burrow. Shallow soils may be subject to cave-ins, and will not maintain a tunnel. Light textured, porous soils with good drainage allow for good gas exchange between the tunnel and the atmosphere. Soils with a high clay content, or those that are continuously wet, diffuse gases poorly and are unsuitable for gophers.

Burrow systems consist of a main burrow, generally 4 to 18 inches below ground and parallel to the surface, with a variable number of lateral burrows off the main. These laterals end at the surface with a soil mound or sometimes with only a soil plug.

Pocket gophers eat forbs, grasses, shrubs and even small trees. They are strict herbivores and any animal material in their diet is accidental. Pocket gophers feed on plants in three ways. They may go to the surface, venturing only a body length or so from their tunnel opening to feed on above-ground vegetation. They may feed on roots they encounter when digging. They frequently pull vegetation into their tunnel from below. Pocket gophers eat forbs, grasses, shrubs, even small trees. They are strict herbivores and any animal material in their diet appears to be accidental. Alfalfa is apparently one of the most nutritious foods for pocket gophers.

## **Damage Prevention and Control Methods**

### **Habitat Modification**

These methods take advantage of knowledge of the habitat requirements and feeding behavior of pocket gophers, to reduce or eliminate damage.

**Crop varieties.** In alfalfa, large taprooted plants may be killed or the vigor of the plant greatly reduced by pocket gophers feeding on the roots. Plant varieties of alfalfa with several large roots rather than a single taproot. These are more tolerant of damage by pocket gophers.

**Crop rotation.** Annual grains do not establish large underground storage structures, and therefore are not capable of sustaining pocket gophers. The transition of land to annual crops will eliminate pocket gophers in that area.

**Grain buffer strips.** Planting buffer strips of grain around hay fields provides unsuitable habitat around the fields and can minimize immigration of pocket gophers into sensitive areas.

### **Exclusion**

Because of the expense, exclusion is feasible only for exceptionally valuable crops such as ornamental shrubs or landscape trees. Bury 1-inch mesh wire mesh at least 18 inches into the soil and leave 6 inches above the soil.

### **Repellents and Frightening Devices**

There are no repellents or frightening devices available for pocket gophers that have proven to be efficient in research trials. Those that do work are effective in such a small area that their use is not practical. Noise-making and vibration devices and plants reported to repel pocket gophers have not been proven effective. Ultrasonic and other electronic devices have also not proved effective in University research.

## Trapping

Trapping is usually the best way to control pocket gophers without chemical use.

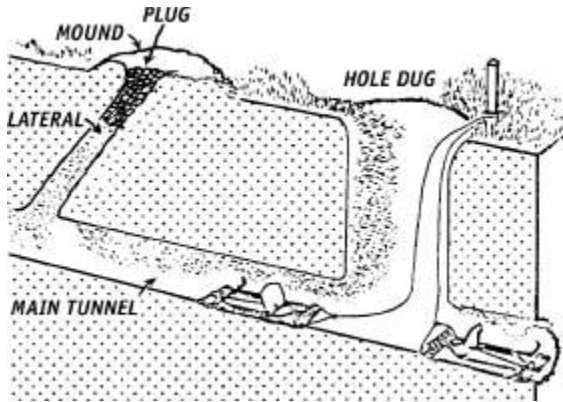
Effective and efficient trapping of pocket gophers requires three key elements. First, use plenty of traps. You want to have at least one trap for every fresh mound in your field. Second, careful inspection of the property to determine the location of the newly constructed mounds. Newly constructed mounds tend to be taller, have more granulated soil that is less compacted, and darker color. Mounds that are flattened with light tan coloration are old mounds and should be avoided. Third, trapping requires patience and effort. A fair amount of labor must be expended to both set traps and to check them on a daily basis. Most trapping failures occur because people give up too quickly.

Once you have identified the areas with fresh mounds, you must decide how you plan to trap them. To have two methods. The first method sets the trap in the **lateral tunnel**. The second method sets traps in the **main tunnel**. Both have their advantages and disadvantages. Placement of traps in the lateral tunnel requires less work, but requires proper traps to prevent frequent misfires as pocket gophers plug the opening. Placement of traps in the main tunnel may have a higher capture rate but requires a great deal of effort in digging the hole and requires a trap pointing in each direction in the tunnel.

The key to the efficient and effective use of **main tunnel** trapping methods is locating the main burrow system. The main runway generally is found 12 to 18 inches away from the plug on the fan shaped mounds. Push a ¼ -inch solid rod into the ground to locate the main burrow, which will be 6-18 inches deep. As you push the rod into the ground, it will become easier to push when the tip enters the runway.

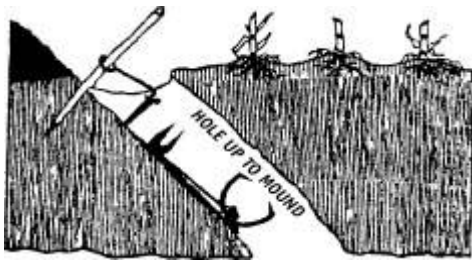
After locating the main runway, dig a small hole and remove all dirt from the tunnel. Place traps in each direction and attach them to a stake at the surface with a wire (Fig 1.).

Place a piece of plywood or cardboard over the hole and pack dirt around the edges to prevent light or air from entering the tunnel system. Holes should be flagged.



**Fig. 1. Placement of a solid pan trap in main pocket gopher tunnel.**

An easier way to trap pocket gophers is with an open-pan trap (DK Gopher Trap®), which is triggered by the pocket gopher attempting to plug the hole. This type of trap can be used very effectively in the lateral runway (Fig. 2.). This eliminates the need to probe and dig to access the main runway.



**Fig. 2. An open pan trap placed in a lateral runway.**

When using a trap with an open trigger pan, you must first locate and open the plug of a fresh mound. Use your finger to poke around and find the softer dirt of the entrance. Clean out the loose dirt and make the opening only large enough to insert the trap. The trap jaws should be 8-12 inches down into the lateral tunnel. Stake the trap. Do not plug the hole. The light and air will attract the pocket gopher. When the gopher tries to plug the hole he will get caught.

Check the traps daily and leave them in place for a day or two after you catch a pocket gopher during spring and early summer when young may be with the adult females. If a trap is not sprung within 48 hours, move it to a new location.

Closed-pan traps are available from hardware and garden supply stores. Open pan traps are available from P-W Mfg. Co. (888-278-2186) and from several online sources.

### **Other Methods**

In flower gardens or other areas where landscape disturbance is not desirable, some success has been achieved by flooding pocket gophers out with a garden hose. Insert

the hose into the lateral tunnel and pour water into the tunnel system until the gopher is flushed out. This method can only be used in new tunnel systems, and only where other damage from the water will not be a factor.

Fumigation of pocket gopher holes with gasoline, propane or exhaust from an automobile has been reported but is NOT RECOMMENDED because of safety hazards. These methods could result in serious explosions or the placement of toxic fumes in undesirable areas.

### **Benefits of Pocket Gophers**

Although in many cases the damage caused by pocket gophers is the overriding factor, the benefits of pocket gophers should be recognized. Some of these are:

- Increased soil fertility by adding organic matter such as buried vegetation and fecal wastes.
- Increased soil aeration and decreased soil compaction.
- Increased rate of soil formation by bringing subsoil material to the surface of the ground, subjecting it to weatherization.
- Increased water infiltration

### **Acknowledgments**

Much of the information presented here was adapted from S.E. Hygnstrom (1994) in *Prevention and Control of Wildlife Damage*, University of Nebraska, Lincoln, NE.

Figure 1 is adapted from E.K. Boggess (1980), "Pocket Gophers", in *Handbook on Prevention and Control of Wildlife Damage*, Kansas State University, Manhattan.

Figure 2 is courtesy of P-W Manufacturing Company.

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