

Managing Pocket Gophers

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Pocket gophers are burrowing rodents that live almost entirely underground. These medium-sized rodents are approximately 9 to 12 inches long and weigh 7 to 14 ounces. They are named pocket gophers because of their large and external fur-lined cheek pouches, one on either side of the mouth. These patches or pockets are used for carrying food. Gophers have powerfully built forequarters with large claws on their front feet, a short neck, external ears, small eyes, and lips that close behind their large incisors. Their fine soft fur ranges in color from dark brown to nearly white.

Two species of pocket gophers are found in Kansas. The plains pocket gopher (*Geomys bursarius*) is distributed throughout Kansas except for the southeastern quarter. The yellow-faced pocket gopher (*Pappogeomys castanops*) is found only in a limited part of southwestern Kansas. Distinguishing between the two species is rather easy, the plains pocket gopher has two grooves on the midline of the paired upper incisors, while the yellow-faced pocket gopher has one groove. Most species are about the same size.

Pocket gophers obtain the highest densities on light-textured soils with good herbage production. Shallow or sandy soils limit pocket gophers due to tunnel cave-ins, and provide poor insulation from warm summer and cold winter temperatures.

Food habits

Pocket gophers feed on roots encountered while digging, on vegetation pulled into the tunnel from below, and on above-ground vegetation near the tunnel. Pocket gophers prefer above-ground portions of vegetation

when it is green and succulent. The plains pocket gopher prefers succulent forbs in spring and summer but also feeds on grasses – alfalfa and dandelions are preferred by pocket gophers. Occasionally trees and shrubs are clipped just above ground, especially under snow cover.

Biology, Reproduction, and Behavior

Pocket gophers construct burrow systems by loosening the soil with their claws and incisors. The gophers then use their forefeet and chest to push soil out of the burrow. The soil is deposited in fan shaped mounds 12 to 18 inches wide and 4 to 6 inches high (Figure 2).

Burrow systems consist of a main tunnel generally 4 to 18 inches below the soil surface and a variable number of lateral burrows extending from the main. Lateral burrows end



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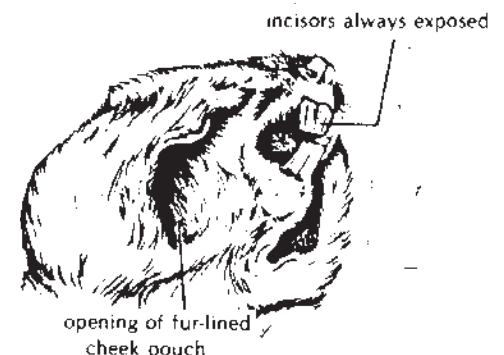


Figure 1. The plains pocket gopher.

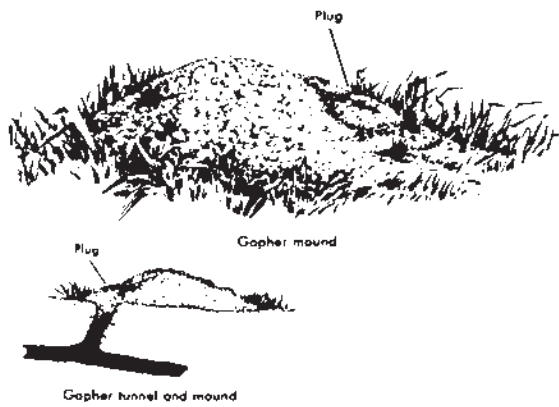


Figure 2. Pocket gopher mound and its relation to the tunnel system.

with a soil mound or only a soil plug at the surface. The main burrow is generally 12 to 18 inches away from the plug. Burrows are about 3 inches in diameter, depending on the size of the gopher. A burrow system may be linear to highly branched, may contain 200 yards of tunnels, and may have several mounds. Pocket gophers can construct 1 to 3 mounds per day although the rate is variable. The mound building of one gopher brings 2 ¼ tons of soil to the surface each year. Mound-building activity is usually greatest in spring and fall.

The plains pocket gopher breeds from February to April and produces one litter of usually 3 to 6 young after a gestation period of about 20 days. Usually, only one adult is found in each burrow system except during the breeding season. Six to 8 plains pocket gophers per acre are considered high densities. Young pocket gophers usually begin dispersing from the natal burrow in June, when about half grown. When on the surface, pocket gophers are subject to predation, particularly by birds of prey such as hawks and

owls. Pocket gophers are also consumed by several mammals including badgers, coyotes, foxes, bobcats, weasels and domestic cats.

Economic damage

Pocket gophers can be a factor in economic loss but also benefit the soil and vegetation in several ways. Their borrowing activities increase soil fertility by adding organic matter in the form of buried vegetation, unused food caches and feces; and to soil formation by bringing subsoil material to the surface where it can be subjected to weathering. Their burrowing increases soil aeration, increases water infiltration, and reduces compaction. Unfortunately, the positive effects are not as visible as the mounds in the hay field, lawn or pasture.

Damage caused by pocket gophers includes destruction of underground utility cables and irrigation pipes, direct consumption and smothering of forage by mounds, and changes in species composition on rangelands by providing mounds for invading annual plants. Pocket gophers can reduce the productivity of alfalfa fields and grasslands by 20 to 50 percent. If gophers are present on 10 percent of an alfalfa field, they may reduce productivity of the field by 2 to 5 percent.

Control methods

Exclusion

Pocket gophers can be excluded from valuable ornamental trees and shrubs with a ¼- to ½-inch hardware cloth fence buried at least 18 inches. Because of the expense and

limited practicality, exclusion is of little use except for highly valued ornamentals, shrubs or landscape trees.

Cultural methods and habitat modification

In alfalfa, large taproot plants may be killed with the vigor of the plant greatly reduced by pocket gophers feeding on the roots. Varieties with several large roots rather than a single taproot suffer less when gophers feed on them.

There are many good reasons for using crop rotations – minimizing problems with pocket gophers is one good reason. When alfalfa is rotated with grain crops, habitat is incapable of supporting pocket gophers. Annual grains do not establish large underground root storage structures, thus there is insufficient food for pocket gophers to survive year-round. Planting 50-foot buffer strips of grain around the fields provides unsuitable habitat around the fields and can minimize immigration of gophers. In orchards, shelterbelts and rangeland situations, control of forbs, which usually have the large roots preferred by gophers, may limit gopher damage by some species of gophers. Flood irrigation can effectively control pocket gophers. Water can fill up gopher burrows, thus causing the gopher to drown or flee to the surface where it is more vulnerable to predation.

Repellents

Although there are some commercially available repellents, there is no scientific supported evidence that they work.

Toxicants

The use of rodenticides may be the most widely used manner to control pocket gophers. Various 0.25 to 0.50 percent strychnine-treated cereal grains, 2 percent zinc phosphide products, and anticoagulants are marketed for the control of pocket gophers. Some baits, including all those registered for use with a burrow builder, are Restricted Use Pesticides. Pocket gophers occasionally plug the tunnel area where a poison bait has been introduced into the burrow system. The bait may be mixed with dirt or possibly carried away. There is some concern that pocket gophers may develop or consume sublethal doses of some toxicants and then develop bait shyness. This behavior has prompted the use of anticoagulants which are slow acting and cause internal hemorrhages when they constitute a substantial part of an animal's diet over a period of several days. Other work has demonstrated that gophers have alternatives for other food during the growing season and that will reduce bait acceptance. Some baits are more highly accepted than others. Excess soil moisture may lead to bait decomposition with some baits in damp burrows.

Baits for pocket gophers must be placed underground. Poison grain baits spilled on the ground may be hazardous to ground-feeding birds or other wildlife.

Baiting for pocket gophers can be done either by hand or by the use of a mechanical "burrow builder." When bait-

ing by hand, the main burrow system must be located and baits should be placed at 2 or 3 locations along the burrow system. A metal probe can be used to locate the tunnel, which is then opened with a shovel or trowel. After the placement of the bait well within the tunnel, the hole should be completely covered. Pocket gophers will be attracted to light and air sources in their tunnels and will close off holes, potentially covering the bait with dirt as they do so.

An alternative to opening the burrow with a shovel is to use a hollow probe that has a bait dispenser attached. A push button dispenses bait when a tunnel is found.

The mechanical burrow builder is drawn behind a tractor and automatically delivers bait to the tunnel it produces. Artificial burrows should be constructed at depths similar to those of natural pocket gopher tunnels and spaced at 15 to 20 feet intervals. The depth of natural tunnels varies with the geographic area and must be determined locally. The tunnels will intersect natural pocket gopher burrows and exploring gophers will find the bait. Do not keep the burrow builder in the ground for more than 200 feet, because that makes super burrows for the gophers to travel. Run the burrow builder in a crisscross pattern in areas of heavy infestation. Disadvantages to the use of a mechanical burrow builder for pocket gophers are the costs that are involved in its purchase and maintenance, and the fact that it can only

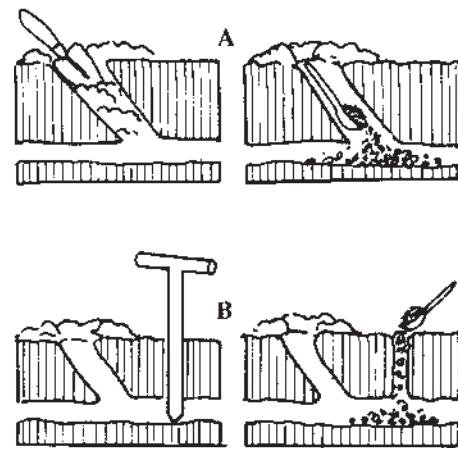


Figure 3. Methods of applying gopher bait by hand or with a probe. (A) Hand application: remove plug in tunnel, starting from the gopher mound. Place quantity of bait into main tunnel with a long handled spoon. Seal tunnel with sod, taking care not to cover the bait with soil. (B) Probe application: Locate the main tunnel with the probe as described in the text. With a spoon, drop the bait into the tunnel through the hole made by the probe. Cover the probe hole with sod.

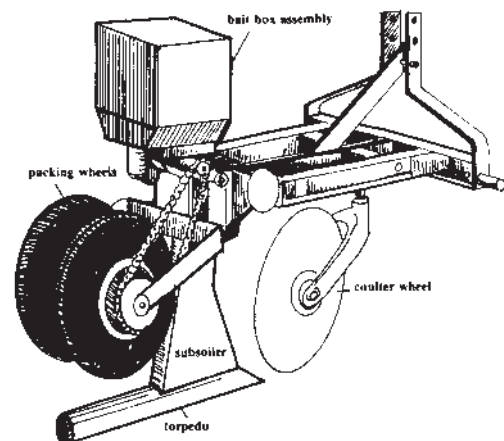


Figure 4. The "burrow-builder" machine may be used to control pocket gophers on large acreages.

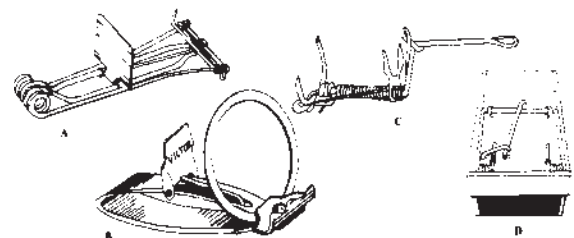


Figure 5. Typical gopher traps: (A) Macabee; (B) Victor Gopher Getter; (C) Death Klutch 1; and (D) DK-2 Gopher Getter.

be used within a restricted range of soil moisture. If the soil is too dry, a good burrow will not be formed; if too wet, the soil will accumulate on the packer wheel behind the burrow builder and the tunnel will not close properly. However, the design of newer burrow builder machines minimize these problems. If it is too wet to farm, it is probably good burrow building conditions. On sandyland, use the burrow builder with 1 to 2 days of rain or pass with the irrigation system.

Fumigants

Several fumigants are registered to control pocket gophers. These include aluminum phosphide and gas cartridges with various active ingredients. Gases are inefficient to control pocket gophers. As the gases move slowly through the burrows, the gophers can quickly plug off portions of their burrow

system to block the passage of gases.

Trapping

Trapping is a very efficient way to control pocket gophers on small to moderate sized fields (less than 50 acres) and to remove remaining animals after a toxicant program. Body gripping traps (DK-1, Macabee, Victor, Blackhole, DK-2 Gopher Getter, EZ-set) are available from hardware, lawn and garden or farm supply stores.

SET TRAPS AS FOLLOWS:

- Look for fresh mounds or earth plugs. Note that pocket gophers do not mound as much in spring as at other times of the growing season.
- Use a 3 feet long (½ inch diameter) metal rod to probe the ground (12 to 18 inches) away from the mound to find a main tunnel. The release of ground friction will be felt when

the probe drops into a tunnel. A lateral tunnel can also be found by probing through the earth plug located near the edge or in between mounds.

- Open the burrow system with a garden trowel or shovel.
- Insert a trowel or a stick in the tunnel and reach as far as you can in each direction to ensure that the tunnel is active and has not been plugged off.
- Set the trap into the tunnel's mouth. The trigger must be placed away from the excavation in the direction of travel. Set the trigger so that it can easily be fired. Tie the trap to a stake. Traps can be left open or covered after setting.
- Flag the burrow system for easy retrieval of the trap.
- Check traps daily or more often since gophers often visit the trap within a few hours.

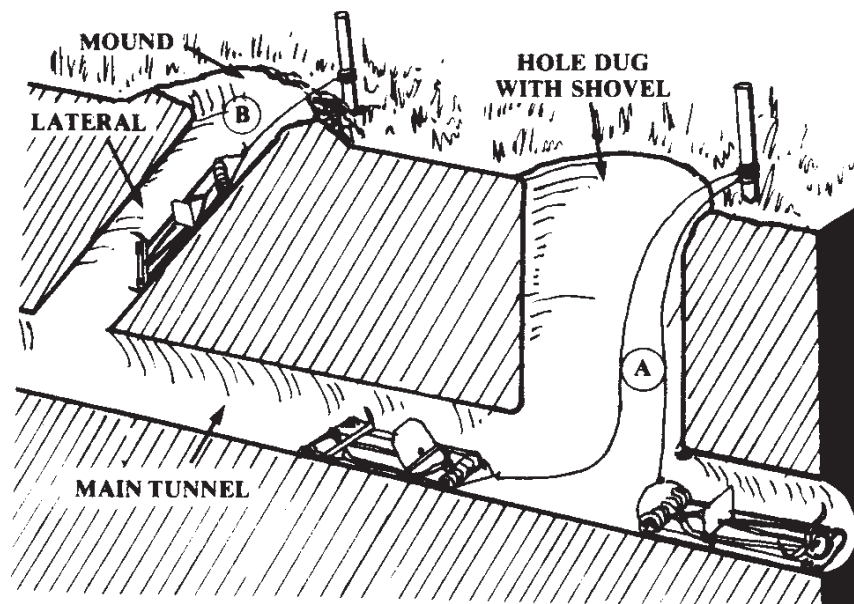


Figure 6. Methods of placing gopher traps into burrow systems: (A) Place two traps set the opposite directions in the main tunnel; (B) Set single trap in lateral tunnel from which the soil plug has been removed. Wire each trap to a stake.

- If a trap is not visited within 48 hours, move it to a new location.

Trapping works best in early spring. Use plenty of traps and start in the center of the field and move towards the edges. After a gopher is caught, leave a small hole open in the burrow system, when it is plugged, it means a new gopher has moved into that burrow. When it appears the field has been trapped out, level all mounds by dragging and set traps in old burrow systems along the borders of the field. Check the field periodically and set traps immediately when new burrows are found. Preventative trapping can reduce long term losses in fields.

Burrow Builder Companies and Bait Sources*

(This list is not exhaustive. Inclusion does not imply endorsement, nor does omission imply criticism.)

Manufacturers

Elston Manufacturing, Inc.
706 N. Weber
Sioux Falls, SD 57103
800-845-1385

The Perry Company
P.O. Box 7187
Waco, TX 76714
800-792-3246

Redball
P.O. Box 159
Benson, MN 56215
877-332-2551

Western Alfalfa
P.O. Box 186
Herndon, KS 67739
800-558-5664

* Rhodes Chemical
1129 Merriam Lane
Kansas City, KS 66103
800-255-0051

* Pueblo Chemical & Supply Corporation
S Star Route
Garden City, KS 62846
316-275-4271

* Von Diest Supply Co.
P.O. Box 410
McCook, NE 69001
800-652-9306

Notes:

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

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