Mole and Gopher Control

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Moles Insectivores	Gophers Herbivores
Eat insects, white grubs, 45 to 50 Pounds of earthworms per year	Eat alfalfa, roots of any garden plants and orchards, Bermuda grass rhizomes
Eat 70 – 100% of weight daily	Can eat electric lines and irrigation pipe
Adult length: 3 – 8 inches	Adult length: 6 – 13 inches
Adult weight: 4 oz.	Adult weight: 4 – 16 oz.
Color: gray, brown, silver	Color: light to dark brown
Eyes: none visible	Eyes: visible
Ears: small openings	Ears: external ears
One litter per year (March – April)	One or two litters in spring and fall
Litter size: 3 – 5	Litter size: 1 – 6
Life span: 1 to 2 years	Life span: 1 to 3 years
Visible surface tunnels	**Surface mounds**
Tunnel depth: 1 – 2 inches	**Tunnel depth: 4 – 15 inches**
Digging speed: 18 feet per hour	May create 300 mounds and move 4 tons of soil in a year
Traveling speed: 80 feet per minute	Can move as fast backward as forward Can turn around in tunnel
Control: Trapping with spike / harpoon, loop and scissor traps, poison bait or barriers	Control: Trapping with Victor Black and Box, McAbee, Easy Set traps, Trapline Products, poison bait or barriers

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Mole Trapping Tip

Instinct is to remove obstacles and open tunnels.

Multiple traps increase chance of success.

Proper trap placement and making guide holes for spike traps are important.

Move traps every one or two days.

Don't leave traps out in the yard through winter.

Clean traps before putting them up.

Keep trap spikes sharp and oil moving parts.

Gopher Trapping Trips

Instinct is to plug openings in tunnels.

Attack freshest mounds first.

Make sure wire traps fit in tunnels snuggly, but still function.

Placing wire traps back in tunnels 8"– 12" improves chances of success.

Make sure that no other tunnels intersect in front of wire traps.

Back Box traps are easy to set and simple to see a successful catch.

One pair of traps per burrow is usually enough.

After success, sometimes reset traps in same burrow.

Sometimes covering set traps is effective.

If there's no activity in two days, the burrow may be abandoned.

Three to five burrows usually indicate only one gopher.

Clean traps before putting them up.

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Managing MOLE Damage

There are several species of moles in the United States, but the only one found in Texas is the eastern mole (*Scalopus aquaticus*).

Moles are small, burrowing mammals that feed on insects. Moles have furless, pointed snouts, small eyes concealed in the fur, and no external ears. They have broadened, shovel-like front feet, webbed to the base of the claws, that enable them to dig effectively for insects. Moles have a keen sense of smell and touch but are almost blind. They are most active on damp, cloudy days in the spring and fall.

Moles live in the seclusion of underground burrows, coming to the surface only rarely, and then often by accident. Because of its secluded life underground, the mole has only a few natural enemies. Coyotes, dogs, badgers and skunks dig out a few of them, and occasionally a cat, hawk or owl surprises one above ground. Probably the greatest threat to moles is the flooding of lowlands during rainy seasons.

The principal diet of moles consists of earthworms, grubs, beetles and insect larvae. Vegetation occasionally makes up a small portion of their diet. They eat from 70 to 100 percent of their weight each day to compensate for the tremendous amount of energy expended in burrowing through soil. Because of their food requirements, moles must cover a larger area than most animals that live underground. Therefore, three to five moles per acre is considered a high population for most areas.

Damage

Moles destroy only a few plants or bulbs by direct feeding. The main damage is done when plant roots are dislodged as the animals tunnel through the soil in search of insects. Their burrowing can disfigure lawns and parks, destroy flower beds, tear up the roots of grasses and create havoc in small garden plots.

Biology and Reproduction

Adult weight: 4 ounces.
Total length: 7 inches.
Color: Grayish-brown.
Gestation: 42 days.
Litter size: Three to five.
Litter number: One litter per year, born March to early April.
Weaning: 1 month.

Trapping

Trapping can be a satisfactory method of control when the habits and instincts of the mole are understood. A mole becomes suspicious when its sensitive nose encounters anything foreign in its runway. Therefore, it will back up and burrow around or under an ordinary trap set in its tunnel. It is not suspicious of dirt blocking the

runway since its burrow frequently is closed by the impact of farm machinery, man and large animals. The mole pushes its way into a dirt blockage, reopens it, and continues on its way.

There are special mole traps designed to take advantage of this behavior. Harpoon and choker loop traps encircle or are suspended above the runway. The trap's trigger pan rests on the dirt blockage. Pushing into the dirt obstruction, the mole lifts the trigger pan and releases the trap spring. Traps are available at hardware, lawn and garden, or farm and ranch supply stores.

The best trap set is in a frequently used runway. A runway that follows a straight course for some distance or one that connects two systems of workings usually is in constant use. A tunnel that has mouse holes or other breaks in it is an inactive tunnel. Active runways can be located by depressing the tunnel in the evening. The following morning, the active runways will be raised again. Set a trap where the active tunnel is raised. If a catch is not made within several hours, relocate the trap to another active tunnel. Reset the trap whenever a catch is made because main runways may be used by several moles.

Deeper tunnels usually are 3 to 12 inches or more below the surface, and are located along fence lines or ridges in open fields or at crossings from sodded to cultivated ground. An entire field can be treated successfully by setting traps along the fence rows in early spring at the first signs of activity. Moles may be trapped at any season, but it is not practical to do so when the ground is frozen or exceedingly dry.

Setting Procedure for Choker Loop Trap

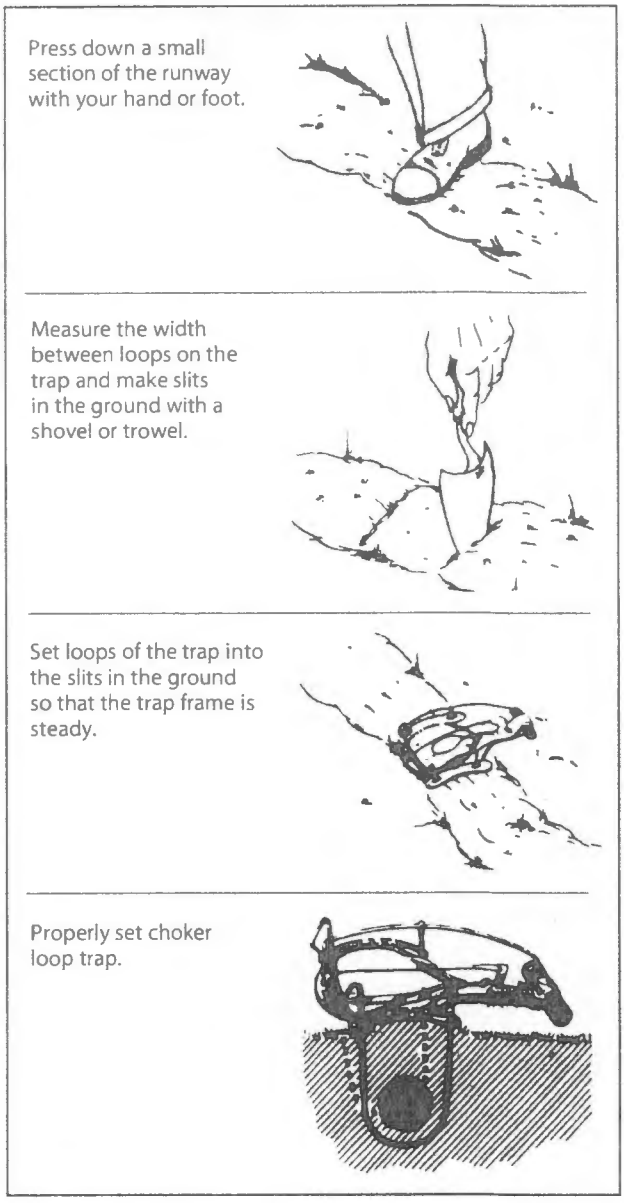
Press down a small section of the runway with your hand or foot to make a firm base for the trigger pan. The trigger should rest at least an inch above the original tunnel. Measure the width between loops and make slits in the soil for the loops with a shovel or trowel. Set the loops in the ground so that the trap frame is steady. Loops must encircle, not intersect, the tunnel.

Setting Procedures for Harpoon Trap

Prepare the ground as for the choker loop trap. Press trap supports firmly into the ground to the depth allowed by the trigger. Set the trap and spread loose soil lightly over the prong holes.

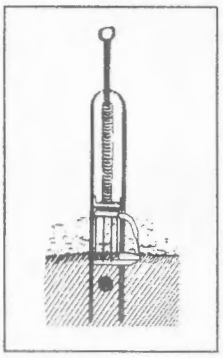
Cultural Control and Habitat Modification

Packing the soil with a roller or reducing soil moisture may make the habitat undesirable to moles. Moles may also be encouraged to leave an area if insecticides are used to kill the insects and worms on which they feed. However, before leaving the area moles may increase their digging in search of food, thereby increasing the damage to turf or garden areas. If you wish to begin an insect control program in an effort to discour-



age moles, contact your agricultural Extension agent for further information.

Sometimes, small areas such as seedbeds or gardens sustain persistent mole damage. In such areas the installation of a barrier made of sheet metal or hardware cloth may be justified. The barrier should begin at the ground surface, go to a depth of at least 12 inches, and bend outward at a 90-degree angle for an additional 10 inches. All seams in the barrier must be secure if it is to be effective.



Properly set harpoon trap.

Toxicants

Commercial baits are available at hardware, lawn and garden, or ranch supply stores. However, poisoning moles is usually not effective because moles normally do not eat grain baits.

Fumigants

Fumigants registered for use against moles include aluminum phosphide and gas cartridges. These may be restricted-use pesticides that can only be used by a licensed pest control operator or by a person who has a private applicator's license to use such chemicals. These fumigants are most effective if placed in the deep burrows rather than in the surface runways. Care should be taken when using chemicals, and the label instructions should be read, understood and followed precisely.

For additional information, contact the nearest office of Texas A&M AgriLife Extension Service - Wildlife Services.

Texas A&M AgriLife Extension Service–Wildlife Services
P.O. Box 690170 • San Antonio, Texas 78269-0170

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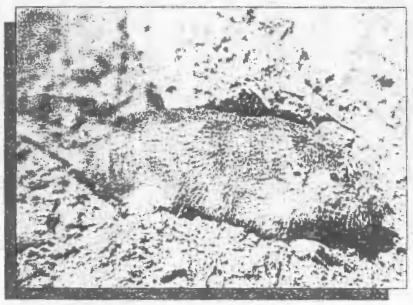
Managing POCKET GOPHER Damage



Pocket gophers are burrowing rodents which live almost entirely underground. Gophers are well adapted to their underground existence, with stout forelegs and strong curved claws for digging. They have prominent, yellow incisor teeth and large, fur-lined external cheek pouches in which food is carried. Pocket gophers have poor eyesight, but their other senses are acute. Their tails are sensitive and are used as feelers when the animals travel backward in their burrows.

Pocket gophers are rarely seen because they spend most of their lives in underground tunnel systems. Their presence in an area is indicated by the characteristic mounds they create. Pocket gophers should not be confused with moles, which are insectivorous and sometimes construct tunnels and mounds resembling those made by pocket gophers.

Gophers are solitary animals except during the mating season and when young are being cared for. Otherwise, there is only one gopher in each tunnel system. Pocket gophers dig extensive tunnels or runways that consist of a main tunnel with several short lateral tunnels. A single gopher may have a burrow system that extends as much as 800 feet, covers an acre of ground, and ranges from a few inches to several feet deep. Runways vary from 2 to 5 inches in diameter depending on the gopher species. These runways serve as homes, storehouses and routes for underground searches for food. The shallow runways, 4 to 15 inches below the surface, are used primarily to search for food. The gopher pushes soil from the burrows to the surface with its forefeet and chest, forming a characteristic horseshoe shaped mound approximately 8 to 24 inches in diameter and 6 inches high. The mounds are at the ends of short, lateral tunnels which branch off the main runway. The surface opening, used to expel dirt from the burrow, is plugged by pushing dirt into it. This results in a depression on one side of the mound (Fig. 1).

Biology and Reproduction

Adult weight: Up to 1 pound.

Total length: 6 to 13 inches.

Color: Light brown to deep chocolate.

Body: Stocky, short-legged.

Gestation period: Depending on species, 18 to 51 days.

Litter size: Ranges from one to six, averaging two.

Litter number: May have two per year, usually born from March to July.

Life span: 1 to 2 years.

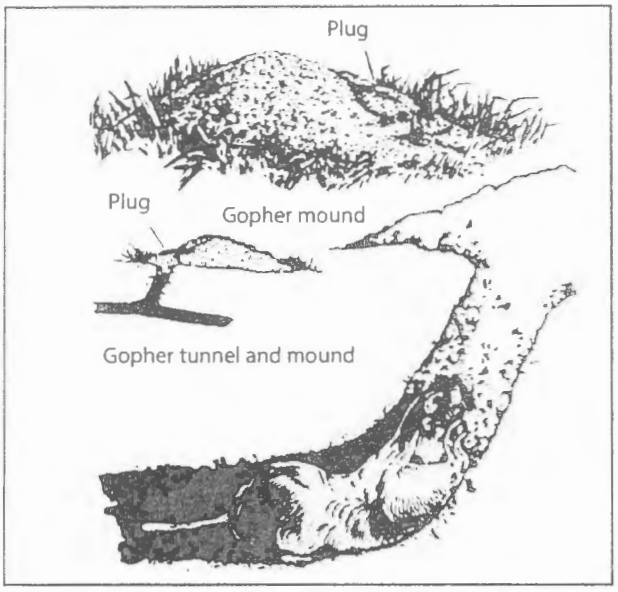


Figure 1. Pocket gopher using nose and front feet to tamp earthen plug to tunnel.

The pocket gopher's diet mainly consists of fleshy roots of various plants, including trees. Gophers normally eat tubers such as potatoes and peanuts. They also eat green tops and seeds that can be pulled down into their burrows.

Effects of Pocket Gophers

Under natural conditions, gophers are beneficial to the soil. It is estimated that in a year, one gopher transports 2½ tons of soil to the ground surface. By bringing subsoil to the surface where it weathers more quickly, gophers contribute to the soil building process. The loosened soil makes the ground more fertile. Air and water can easily pass through porous soil to plant roots.

Gophers can cause serious damage when they establish tunnel systems in cultivated farming areas, rangelands, orchards, tree farms and lawns. When there are many gophers they can damage field and pasture crops by eating the crops and by forming mounds which interfere with farm machinery. Gophers reduce the amount of livestock forage available on rangeland by harvesting and burying vegetation. They gnaw or clip the roots of trees, which may kill seedlings or small trees and reduce the vigor of large trees.

Pocket gophers in a lawn, garden or flower bed can destroy plants and produce unsightly mounds. Gophers gnaw through underground plastic water pipes and electrical and communications cables, and interfere with irrigation dikes. A tunnel system in a dam can cause it to erode and wash out. Tunnels under paved highways may cause the pavement to sink.

Controlling Pocket Gophers

Control operations should be conducted during the spring and fall when pocket gophers are most active near the surface. Their activity is usually indicated by the presence of fresh mounds of dirt. Control operations in the fall interfere the least with growing crops. Methods of control include mechanical and chemical means.

Mechanical Control

In small areas such as yards or gardens, or where there are only a few pocket gophers, trapping is usually satisfactory. Special traps have been designed to capture gophers. Several different types are available at hardware or farm and ranch supply stores (Fig. 2). Because success depends upon the proper use of traps, the following steps are suggested:

1. Locate the newest mound or series of mounds.

2. Locate the main runway by probing the soil with a bluntly pointed probe, 6 to 8 inches from the mound on the side where the horseshoe-like depression is found (Fig. 3). When the probe drops into the runway, the release of ground friction will be felt.

A probe can be made from a bluntly pointed broom or shovel handle. Excellent probes are

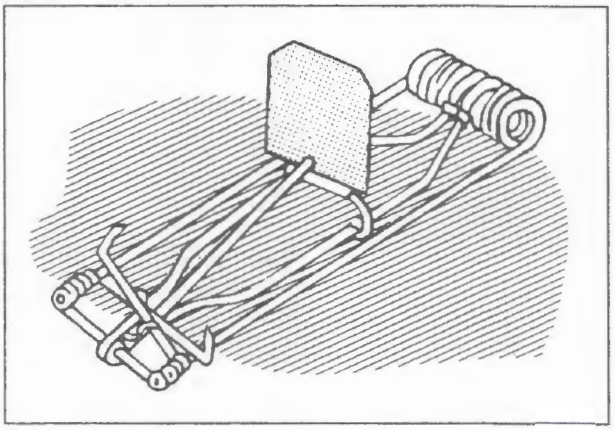


Figure 2. Macabee gopher trap.

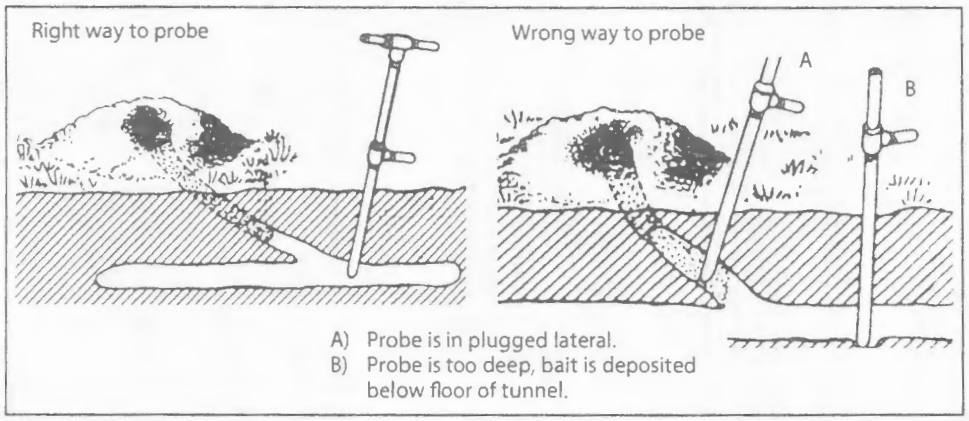


Figure 3. Right way and wrong way to probe.

made with a 3-foot section of a ¾-inch gas pipe welded to a blunt point. Thread the cut end and fit it with a "T" joint. Four-inch nipples with the threads cut off of one end can be screwed into the "T" joint to form a handle. A moveable foot rest can be made of a 1-inch "T" joint slipped over the main probe and held in place with a set screw. A 4-inch nipple screwed into the "T" completes the foot rest.

3. Dig down with a trowel or shovel to locate the runway. The traps should be placed as far into the tunnel as possible. It may be necessary to enlarge the runways to allow the traps to operate properly. Leave the hole open , because the gopher will be attracted to the opening to plug it.

4. Secure the trap with a piece of small, flexible wire attached to a stake so the gopher cannot pull it into the tunnel.

5. If traps are set in the main runway, set and place two traps, one in each direction from the hole (Fig. 4A). If traps are set in lateral runways, unplug the tunnel entrance at the mound. Place one trap, jaws forward, in the lateral tunnel with the trap jaws pointing toward the main runway (Fig. 4B). Do not block the main runway.

6. For best results, visit the trap-sets every half-hour.

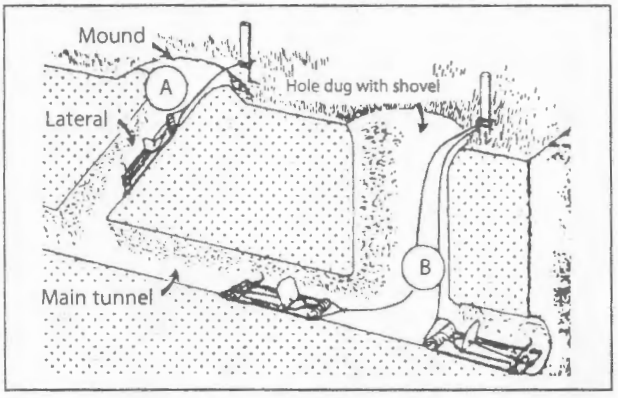


Figure 4.

Chemical Control

Effective control materials for gophers are strychnine-treated grain and zinc phosphide pellets. Toxic baits can be administered by the hand probe method or with a burrow builder. These methods are most efficient for large or heavily infested areas where trapping is not practical. Because the toxic grain is placed underground, it is relatively safe when used around other wildlife, pets and livestock. However, you should always carefully read and follow pesticide label instructions. Some of these products are classified as "restricted use" and require a certified pesticide applicator's license.

Hand Baiting

Two techniques are used to locate main runways so that bait can be properly placed. The first method is the same as the one described under "Mechanical Control." The second is to probe the area in a perpendicular line between two fresh mounds, assuming that the main runway makes a direct connection between them.

After locating the main runway, remove the probe and insert the recommended doses of bait material. Close the opening with grass or paper and cover it with dirt to keep out light and air. Do not cover the bait with soil. Determine the overall extent of the individual main runway. Place bait near each end, as well as at one or more locations in the central part of the system.

In predominantly sandy soil, or whenever the runway is difficult to locate with a probe, locate the burrow plug at the mound. This can be done by carefully scraping the dirt from a fresh mound

until a round circle of fresh dirt is found plugging the lateral runway. Open the lateral to the main runway with a long handled spoon and insert the recommended dosages of bait. Plug the surface opening with grass or heavy paper and cover with dirt. A relatively simple way to find survivors is to level all fresh mounds after baiting. Fresh mounds can then be identified and re-baited as necessary.

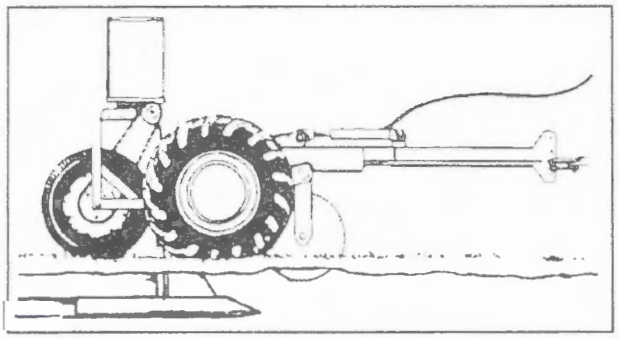


Figure 5. Burrow builder.

Burrow Builder Baiting

The burrow builder constructs an artificial burrow and, at the same time, dispenses bait underground (Fig. 5). It is attached to a tractor and pulled back and forth across a field to make a series of parallel burrows. The gophers will explore the artificial burrows and find the poison bait. The soil must have good plowing moisture for effective construction of artificial burrows. If the soil is damp enough that a handful will hold its shape when compressed, it is suitable for using the burrow builder. Constructed burrows should be at the average depth of the natural gopher burrow. Effective treatment depends upon gophers finding the artificial burrows and using them long enough to find the bait.

Burrows should be made at 25- to 30-foot intervals along the contour of the land. For best results, boundary and fence lines also should be treated. If the gopher infestation is moderate to light, effective control is possible with burrows baited at 40- to 50-foot intervals. If spot treatment is all that is needed, use the burrow builder only where mounds are visible, or along boundary fence lines. Always follow the label directions carefully.

If orchard or forest seedlings are to be planted in areas where gophers are present, the area should be treated before planting as if for heavy infestation of gophers. Treat as needed halfway between the tree rows to prevent root damage.

Fumigants

Fumigants have limited use for controlling pocket gophers. The extent of the burrow system, the chance for leakage of gas through the softer earth in laterals, the closeness of the main runs to the soil surface, and the fact that gophers may quickly plug their burrows when toxic gas is detected, makes the use of fumigants unsatisfactory.

For additional information contact the nearest office of the Texas A&M AgriLife Extension Service–Wildlife Services.

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