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# POCKET GOPHERS

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*Integrated Pest Management for Home Gardeners and Landscape Professionals*

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Pocket gophers (*Thomomys* spp.) are burrowing rodents that get their name from the fur-lined external cheek pouches, or pockets, that they use for carrying food and nesting materials. They are well equipped for a digging, tunneling lifestyle with powerfully built forequarters, large-clawed front paws, fine short fur that doesn't cake in wet soils, small eyes and small external ears, and highly sensitive facial whiskers to assist movements in the dark. An unusual adaptation is the gopher's lips, which can be closed behind the four large incisor teeth to keep dirt out of its mouth when it is using its teeth for digging.

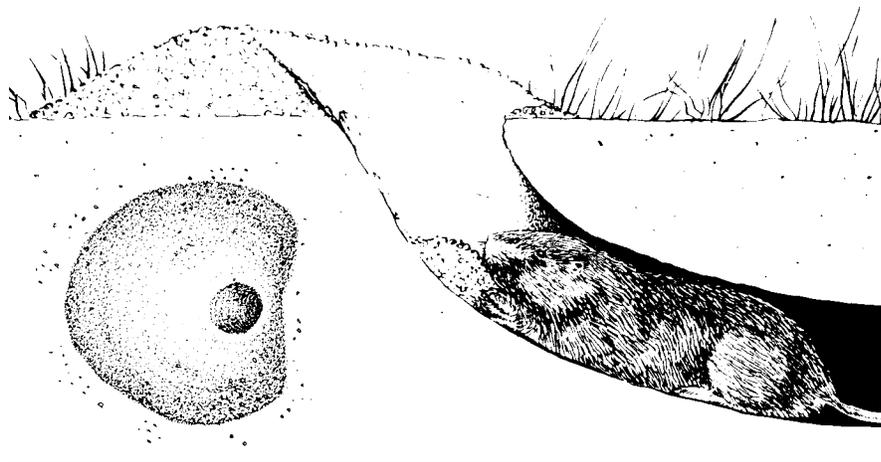


Figure 1. Top and side views of an unplugged pocket gopher mound.

## IDENTIFICATION

Five species of pocket gophers are found in California, with Botta's pocket gopher (*Thomomys bottae*) being most widespread. Depending on the species, they may range in length from 6 to 10 inches. Although they are some-

times seen feeding at the edge of an open burrow, pushing dirt out of a burrow, or moving to a new area, gophers for the most part remain underground in the burrow system.

Mounds of fresh soil are the best sign of gopher presence. Mounds are formed as the gopher digs its tunnel and pushes the loose dirt to the surface. Typically mounds are crescent- or horseshoe-shaped when viewed from above (Fig. 1). The hole, which is off to one side of the mound, is usually plugged. Mole mounds (Fig. 2) are sometimes mistaken for gopher mounds. Mole mounds, however, appear circular and have a plug in the middle that may not be distinct; in profile they are volcano-shaped. Unlike gophers, moles commonly burrow just beneath the surface, leaving a raised ridge to mark their path.

One gopher may create several mounds in a day. In nonirrigated areas,

mound building is most pronounced during spring or fall when the soil is moist and easy to dig. In irrigated areas such as lawns, flower beds, and gardens, digging conditions are usually optimal year round and mounds can appear at any time. In snowy regions, gophers create burrows in the snow, resulting in long, earthen cores on the surface when the snow melts.

## BIOLOGY AND BEHAVIOR

Pocket gophers live in a burrow system that can cover an area of 200 to 2,000 square feet. The burrows are about 2½ to 3½ inches in diameter; feeding burrows are usually 6 to 12 inches below ground, whereas the nest and food storage chamber may be as deep as 6 feet. Gophers seal the openings to the burrow system with earthen plugs. Short, sloping lateral tunnels connect the main burrow system to the surface and are created during construction of the main tunnel for pushing dirt to the surface.

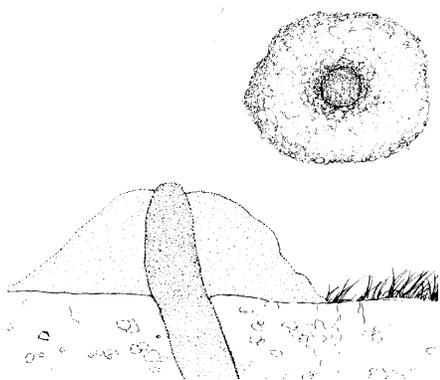


Figure 2. Top and side views of a mole mound.

Gophers do not hibernate and are active year-round, although fresh mounding may not be seen. They also can be active at all hours of the day. Gophers usually live alone within their burrow system, except for females with young or when breeding, and may occur in densities of up to 16 to 20 per acre.

Gophers reach sexual maturity at about 1 year of age and can live up to 3 years. Females produce one to three litters per year. In nonirrigated areas, breeding usually occurs in late winter and early spring, resulting in one litter per year, whereas in irrigated sites, up to three litters per year may be produced. Litters usually average five to six young.

Pocket gophers are herbivorous, feeding on a wide variety of vegetation, but generally preferring herbaceous plants, shrubs, and trees. Gophers use their sense of smell to locate food. Most commonly they feed on roots and fleshy portions of plants they encounter while digging. However, sometimes they feed aboveground, venturing only a body length or so from their tunnel opening. Burrow openings used in this manner are called "feed holes." They are identified by the absence of a dirt mound and a circular band of clipped vegetation around the hole. Gophers will also pull entire plants into their tunnel from below. In snow-covered regions gophers may feed on bark several feet up a tree by burrowing through the snow.

### DAMAGE

Pocket gophers often invade yards and gardens, and feed on many garden crops, ornamental plants, vines, shrubs, and trees. A single gopher moving down a garden row can inflict considerable damage in a very short time. Gophers also gnaw and damage plastic water lines and lawn sprinkler systems. Their tunnels can divert and carry off irrigation water and lead to soil erosion. Mounds on lawns interfere with mowing equipment and ruin the aesthetics of well-kept turfgrass.

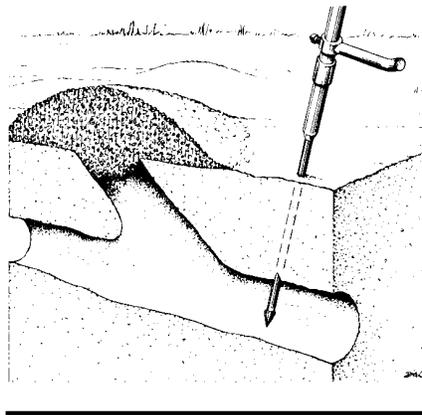


Figure 3. A gopher probe.

### LEGAL STATUS

Pocket gophers are classified as non-game mammals by the California Fish and Game Code. This means that if they are found to be injuring growing crops or other property, including garden and landscape plants, they may be controlled at any time and in any legal manner by the owner or tenant of the premises.

### MANAGEMENT

To successfully control gophers, the sooner you detect their presence and take control measures, the better. Most people control gophers in lawns, gardens, or small orchards by trapping and/or by using poison baits.

### Probing for Burrows

Successful trapping or baiting depends on accurately locating the gopher's main burrow. To locate the burrow, you need to use a gopher probe (Fig. 3). Probes are commercially available or can be constructed from a pipe and metal rod. An enlarged tip that is wider than the shaft of the probe is an important design feature that increases the ease of locating burrows. Probes made from dowels or sticks may work in soft soil, but are difficult to use in hard or dry soils.

First, locate areas of recent gopher activity based on fresh mounds with dark, moist soil. Fresh mounds that are visible aboveground are the plugged openings of lateral tunnels. The main

burrow can be found by probing about 8 to 12 inches from the plug side of the mound (i.e., to the right of the mound in Fig. 1); it is usually located 6 to 12 inches deep. When the probe penetrates the gopher's burrow, there will be a sudden, noticeable drop of about 2 inches. You may have to probe repeatedly to locate the gopher's main burrow, but your skill will improve with experience. Because lateral tunnels may not be revisited by the gopher, trapping and baiting in them is not as successful as in the main burrow.

### Trapping

Trapping is a safe and effective method to control pocket gophers. Several types and brands of gopher traps are available. The most commonly used is a two-pronged pincher trap, such as the Macabee trap (Fig. 4), which is triggered when the gopher pushes

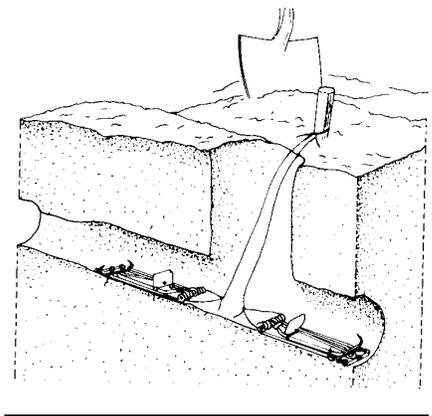


Figure 4. Macabee traps.

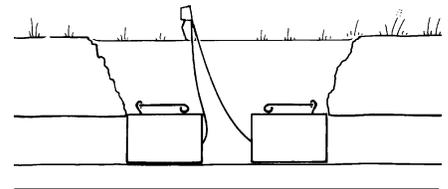


Figure 5. When putting box traps in place, cut the face of the hole smooth so that the traps can be pushed tightly against the tunnels. Cover the traps completely with about 1 inch of soil.

against a flat vertical pan. Another popular trap is the choker-style box trap.

To set traps, locate the main tunnel with a probe, as previously described. Use a shovel or garden trowel to open the tunnel wide enough to set traps in pairs facing opposite directions (Figs. 4 and 5). By placing traps with their openings facing in opposite directions, a gopher coming from either end of the burrow can be intercepted. The box trap is easier to use if you've never set gopher traps before, but setting it requires more excavation than if you are using the Macabee trap, an important consideration in lawns and some gardens. Box traps are especially useful when the diameter of the gopher's main burrow is small (less than 3 inches) because to use the Macabee-type wire traps, small burrows must be enlarged to accommodate them.

It is not necessary to bait a gopher trap, although some claim baiting gives better results. Lettuce, carrots, apples, or alfalfa greens can be used as bait. Place the bait at the back of a box trap behind the wire trigger or behind the flat pan of a Macabee-type trap. Wire your traps to stakes so they can be easily retrieved from the burrow, as shown in Figures 4 and 5. After setting the traps, exclude light from the burrow by covering the opening with dirt clods, sod, cardboard, or some other material. Fine soil can be sifted around the edges to ensure a light-tight seal. If too much light enters, the gopher may plug the burrow with soil, filling the traps and making them ineffective. Check traps often and reset them when necessary. If a gopher is not caught within 3 days, reset the traps in a different location.

### ***Baiting with Toxic Baits***

The key to an effective toxic baiting program is bait placement. Always place pocket gopher bait in the main underground tunnel, not the lateral tunnels. After locating the main gopher burrow with a probe, enlarge the opening by rotating the probe or inserting a larger rod or stick. Following label

directions, place the bait carefully in the opening using a spoon or other suitable implement that is used only for that purpose, taking care not to spill any on the ground surface. A funnel is useful for preventing spillage.

Strychnine-treated grain bait is the most common type used for pocket gopher control. This bait generally contains 0.5% strychnine and is lethal with a single feeding. Baits containing anticoagulants are also available. When using anticoagulant baits, a large amount of bait (about 10 times the amount needed when using strychnine baits) is required so that it is available for multiple feedings. Although generally less effective than strychnine baits, anticoagulant baits are preferred for use in areas where children and pets may be present. When using either type of bait, be sure to follow all label directions and precautions.

After placing the bait in the main burrow, close the probe hole with sod, rocks, or some other material to exclude light and prevent dirt from falling on the bait. Several bait placements within a burrow system will increase success. Tamp down existing mounds so you can distinguish new activity. If new mounds appear for more than 2 days after strychnine baiting or 7 to 10 days after anticoagulant baits have been used, you will need to rebait or try trapping.

If a large area is infested with gophers, a hand-held bait applicator will speed treatment. Bait applicators are a combination probe and bait reservoir. Once a burrow is located using the probe, a trigger releases a measured amount of bait into the tunnel. Generally, strychnine bait is used with such a bait applicator because the applicator dispenses only a small quantity of bait at a time.

### ***Exclusion***

Underground fencing might be justified for valuable ornamental shrubs or landscape trees. To protect existing plantings, bury hardware cloth or 3/4-inch mesh poultry wire 2 feet deep and extended at least 1 foot aboveground

to deter gophers moving overland. This method is less than perfect, however, because gophers may burrow below the wire; also, the wire may restrict and damage root growth of trees. Small areas such as flower beds may be protected by complete underground screening of sides and bottoms. When constructing raised vegetable or flower beds, underlay the soil with wire to exclude gophers. Wire baskets to protect individual plants can be made at home or are commercially available and should be installed at the time of planting. If you use wire, use light-gauge wire for shrubs and trees that will need protection only while young. Leave enough room to allow for the roots to grow. Galvanized wire provides the longest lasting protection.

Six to 8 inches of coarse gravel 1 inch or more in diameter around underground sprinkler lines or utility cables may deter gophers.

### ***Natural Controls***

Because no population will increase indefinitely, one alternative to a gopher problem is to do nothing, letting the population limit itself. Experience has shown, however, that by the time gopher populations level off naturally, much damage has already been done around homes and gardens.

Predators, including owls, snakes, cats, dogs, and coyotes, eat pocket gophers. Predators rarely, however, remove every prey animal, but instead move on to hunt at more profitable locations. In addition, gophers have defenses against predators. For example, they can escape snakes in their burrows by rapidly pushing up an earthen plug to block the snake's advance.

The idea of attracting barn owls to an area for gopher control by installing nest boxes has been explored. Although barn owls prey on gophers, their habit of hunting over large areas, often far from their nest boxes, and their tendency to hunt areas with abundant prey, make them unreliable for gopher control. When a single gopher, which is capable of causing damage rapidly,

invades a yard or garden, a gardener cannot afford to wait for an owl to arrive. Effective action, usually trapping or baiting, must be taken immediately.

### Habitat Modification

Reduction of gopher food sources using either chemical or mechanical methods may decrease immigration of gophers. If feasible, remove weedy areas adjacent to yards and gardens to create a buffer strip of unsuitable habitat.

### Other Control Methods

Pocket gophers can easily withstand normal garden or home landscape irrigation, but flooding can sometimes be used to force them from their burrows where they can be dispatched

with a shovel or caught by a dog. Fumigation with smoke or gas cartridges is usually not effective because gophers quickly seal off their burrow when they detect smoke or gas. But if you are persistent with and use repeated treatments, some success may be achieved.

No repellents currently available will successfully protect gardens or other plantings from pocket gophers. Plants such as gopher purge (*Euphorbia lathyris*), castor bean (*Ricinus communis*), and garlic have been suggested as repellents but these claims have not been substantiated by research. Although there are many frightening devices commercially available to use on pocket gophers (vibrating stakes, ultrasonic devices, wind-powered pinwheels, etc.), pocket gophers do not frighten easily, probably because of their repeated exposure to noise and vibrations from sprinklers, lawnmowers, vehicles, and people moving about. Consequently, frightening devices have not proven to be effective. Another ineffective control method is placing chewing gum or laxatives in burrows in hopes of killing gophers.

### Follow-up

Once pocket gophers have been controlled, monitor the area on a regular basis for reinfestation of the land. Level all existing mounds after the control program and clean away weeds and garden debris so fresh mounds can be

seen easily. It is important to check regularly for reinfestation because pocket gophers may move in from other areas and damage can reoccur within a short time. If your property borders wildlands, vacant lots, or other areas that serve as a source of gophers, you can expect gophers to reinvade regularly. Be prepared to take immediate control action when they do; it is easier, cheaper, and less time-consuming to control one or two gophers than to wait until the population builds up to the point where the gophers are causing excessive damage.

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AUTHORS: T. P. Salmon and W. P. Gorenzel  
 EDITOR: B. Ohlendorf  
 TECHNICAL EDITOR: M. L. Flint  
 DESIGN AND PRODUCTION: M. Brush  
 ILLUSTRATIONS: Figs. 1, 2, 3, 4: from Salmon, T. P., and R. E. Licklitter. 1984. *Wildlife Pest Control around Gardens and Homes*. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 21385. Fig. 5: from *IPM for Almonds*, 2nd ed. Oakland: Agric. Nat. Res. Publ. 3308.

Produced by IPM Education and Publications, UC Statewide IPM Project, University of California, Davis, CA 95616-8620

This Pest Note is available on the World Wide Web (<http://www.ipm.ucdavis.edu>)



This publication has been anonymously peer reviewed for technical accuracy by University of California scientists and other qualified professionals. This review process was managed by the ANR Associate Editor for Pest Management.

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This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.

#### WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash nor pour pesticides down sink or toilet. Either use the pesticide according to the label or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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