

C ontrolling Moles

L.W. Kuhn and W.D. Edge

Moles belong to the mammalian order Insectivora, the insect eaters. Often, however, they are lumped incorrectly with the rodents, which include mice, rats, squirrels, and other gnawing mammals in the order Rodentia. Moles are found throughout the eastern half of the United States and along the Pacific Coast. Four species of moles are found in the Pacific Coast states. Three of these belong to a single genus, *Scapanus*.

Townsend's mole, *Scapanus townsendii*, black to brownish black in color and approximately 6 to 9 inches long, is the largest and causes the greatest damage to lawns, gardens, and croplands. This mole is common in the moist, fertile soils west of the

Cascades in Oregon and Washington and is found in a small area in southern British Columbia and in northwestern California.

The broad-footed mole, *Scapanus latimanus*, is somewhat smaller than Townsend's mole and is more silver-gray or copper-brown in color. It is found from the Klamath Basin of south-central Oregon southward throughout much of California, except in the drier desert regions.

The Coast mole, *Scapanus orarius*, is about half as large as Townsend's mole and occupies much of the same area. It is found farther east in Washington and Oregon and northward into southern British Columbia.

The fourth mole, *Neurotrichus gibbsii*, or "shrew-mole," is blackish in color and about the size of a common house mouse. It closely resembles a shrew in appearance and habits. Present throughout the coastal lowlands from California to British Columbia, it is not abundant nor is it a problem for the home gardener, orchardist, or farmer. As an insect feeder, it probably is beneficial rather than harmful and is not included in this review of methods and

procedures for controlling the three larger moles.

Though differing slightly in size, color, and distribution, Townsend's, broad-footed, and Coast moles have much in common. All have rounded or cylindrical bodies with pointed, somewhat pig-like snouts and short, bare or sparsely haired tails. Front feet are broad, with outwardly turned palms, and are armed with strong nails. Eyes are tiny and well concealed in the short, dark, velvetlike fur. There are no external ears. Moles use their sensitive snout, tail, and perhaps sensory hairs as an "early warning system" to detect enemies and to locate food.

Lee W. Kuhn, professor emeritus of wildlife ecology, and W. Daniel Edge, Extension wildlife specialist, Oregon State University.



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Mole mounds and burrow systems

- Cover pasture grasses and legumes, reducing production
- Make harvesting difficult by plugging or breaking harvesting equipment
- Contaminate hay and silage with dirt, which retards proper curing
- Make ideal seed-beds for undesirable grasses and weeds
- Damage and disfigure lawns and flowerbeds
- Expose shallow-rooted shrubs and plants to drying and to insect pests

A single litter is born in March or April, averaging three or four naked young. Young moles mature quickly and are fully furred, nearly adult size, and on their own in about a month. Average life span is about 3 years. Moles do not hibernate, but are active throughout the year. Surface activity slows during periods of extreme cold or drought.

Moles generally are beneficial because of the number of insects, insect larvae, and other invertebrate prey they eat. They also play

an ecological role by aerating the soil and mixing surface and subsurface soil layers.

Mole damage

Moles sometimes eat or damage tulips, lilies, iris, carrots, potatoes, peas, beans, corn, oats, wheat, and many other plants. Individual moles might feed heavily on such items. Up to 20 percent of the diet of Townsend's mole is plant material.

Some losses are caused by the mole's eating habits, but the primary damage results from burrowing and mound-building activities.

Moles rarely are seen unless captured in traps or killed while burrowing near the surface. But mounds of loose soil pushed to the surface indicate their presence. Moles continually excavate new tunnel systems or extend old ones. They dispose of the excess soil by digging a short lateral tunnel to the surface and shoving the soil out on top of the ground. The resulting mounds, though superficially resembling those of pocket gophers, usually are more rounded and symmetrical. The mounds are built up, volcano fashion, by repeated "eruptions" of soil pushed up through the center of the pile (Figure 1). Pocket gophers usually push soil out to one side, resulting in a flattened semicircle or fan-shaped mound, the plugged exit hole at one side of the pile (Figure 2). Thus, although similar, the workings of these two small earth movers are noticeably different, an important distinction in proper control of both pests.

The burrow system is a vast network of interconnecting tunnels and passages, varying in depth from 3 to

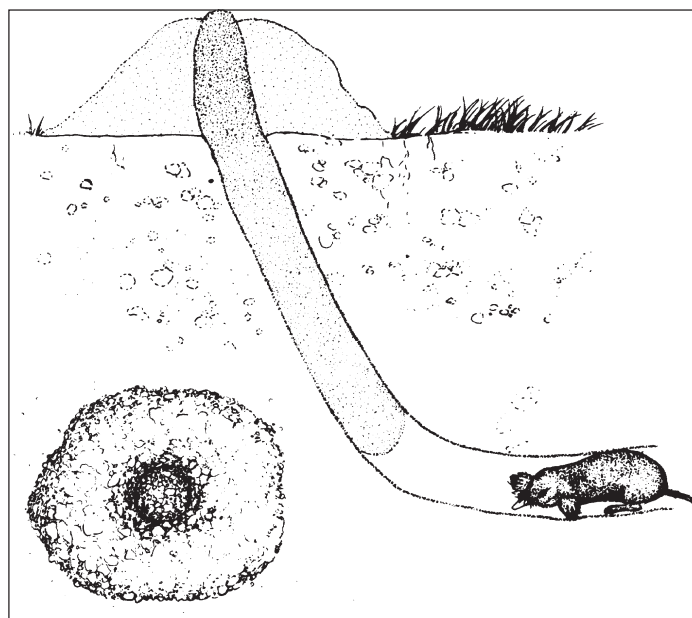


Figure 1.—Mole mounds tend to be circular with a plug in the middle. Compare with the pocket gopher mound in Figure 2.

30 inches or more. Moles are active throughout the year and make regular use of the tunnels from 6 to 10 inches deep. During periods of severe cold or extremely dry weather, earthworms become scarce in the upper soil layers, and moles move into the deeper tunnels in search of food. At such times, surface burrowing and mound-building activities are minimal, and control measures might be less effective.

The number of mounds or ridges in any given area does not indicate the number of moles present. A single Townsend's mole might construct from 50 to 100 mounds in a month. In coastal dairy pastures of Tillamook County, Oregon, densities vary from one mole in 6 acres to more than five per acre, but average only about two per acre. Some of these pastures appear to have been "plowed" by the moles, yet the mounds are caused not by hundreds of moles but by a few. Persistent and careful use of poisoned

baits and well-set traps usually controls them.

Urban dwellers are frustrated by this pesky little animal and dirt piles that pop up overnight in lawns, gardens, or flowerbeds. But usually only one or two moles are present, and they are eliminated easily.

Recommended controls

You can control moles effectively by the proper use of poisoned baits or traps or a combination of both methods. Use traps for moles in home gardens, lawns, or flowerbeds, as generally only a few moles are involved. For larger areas such as fields, pastures, and golf courses, properly placed toxic baits usually are more effective and less time consuming. Baiting might prove to be the simpler and quicker method, but traps probably will be necessary as a follow-up to eliminate animals that avoid the baits.

Trapping

In the Pacific Northwest the scissor-jaw (tunnel trap) mole trap is recommended (Figure 3). By using a probe or iron rod, locate one of the mole's main underground tunnels (Figure 4). Usually these are 6 to 10 inches beneath the surface. Probe between two fresh dirt mounds, or a foot or more from a single mound, to ensure finding a main tunnel and not a side tunnel. Using a garden trowel or small shovel, remove a section of sod and soil slightly larger than the trap width (about 6 inches). The success of this trap depends on building a firm plug of soil in the center of the opened runway for the trigger pan to rest on.

Moist soil from the opened tunnel or from a nearby fresh mound can be pinched together to build the plug. The set trap (with safety catch in place) is then wedged firmly into the opened burrow with the trigger snugly against the top of the dirt plug. Take care when placing the trap so that the open trap jaws straddle, but do not protrude into, the open ends of the mole's tunnel. A carelessly set trap often will cause the suspicious mole to back up and burrow around or under it.

Sift loose dirt onto the set trap to about the level of the coil spring. This excludes light from the opened burrow and makes the mole less suspicious of the plugged tunnel. Release the safety catch, and the trap is complete.

When digging through the plug to reopen its blocked burrow, the mole springs the trap and is caught. (By

contrast, when trapping pocket gophers, leave the burrow system open with the trap in place. The gopher springs the trap when it replugs the open tunnel with soil.)

The "harpoon" or "spear" type trap (Victor mole trap), commonly used in the eastern states, is not recommended for catching western moles. It will work, however, if set on a dirt plug in the deeper tunnels as illustrated for the scissor-jaw trap.

Toxic baits

Because of constantly changing labels, laws, and regulations, Oregon State University can assume no liability for the consequences of use of chemicals suggested here. Read and follow the directions and precautionary statements on the specific pesticide product label.

Because moles are insectivores, eating mainly earthworms and insects, toxic baits are not readily eaten. Zinc phosphide is a general-use pesticide registered in Oregon for control of moles.

Proper baiting placement is the key to success. As when trapping, locate a main runway with a probe or iron rod. Rotate the probe gently to enlarge the hole and drop a teaspoon of bait into the hole so it falls to the floor of the underground tunnel (Figure 4). Close the hole with a clod or by gently pressing with the heel of your shoe so loose dirt does not filter through to cover the bait. Three or four bait placements in the area of freshest mounds are enough. Don't expect instant success. If additional new mounds appear after several days, rebait. Remember, the mole must find the bait in its maze of underground tunnels, then feed on it.

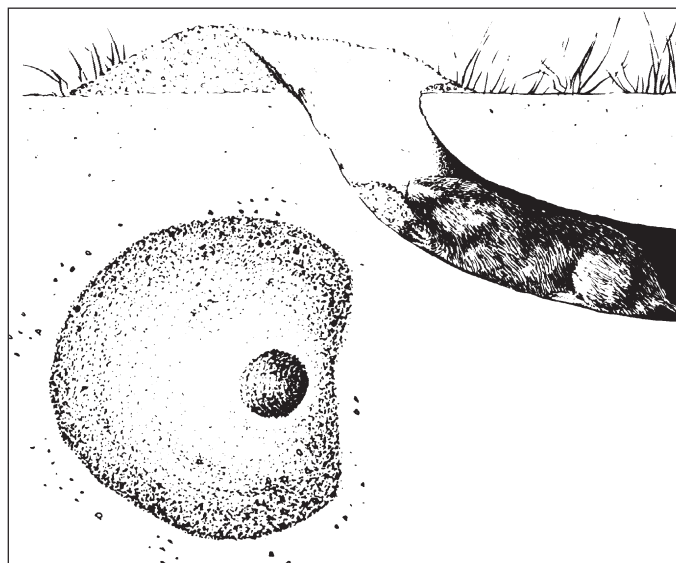


Figure 2.—Typical pocket gopher mound, in cross-section and from above. The pocket gopher pushes soil out (*top*), creating a fan-shaped mound (*above*). The gopher then closes the hole with a soil plug. Compare with the mole mound in Figure 1.

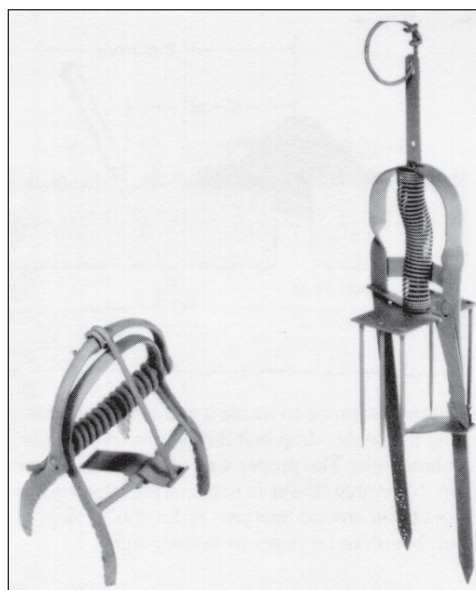


Figure 3.—The scissor-jaw (tunnel trap) mole trap on the left is recommended in the Pacific Northwest. The "harpoon" or "spear" type trap (Victor mole trap) on the right is not recommended for western moles.

Other control measures

Poison gases

Poison gases, some marketed as "gas bombs," are effective for mole control. However, gases are not recommended for controlling moles in extensive tunnel systems; the mole usually can plug and seal off the gassed section quickly and go on

its way to extend tunnels into new areas.

Flooding and fumigants

Flooding the burrow system with a garden hose rarely is effective. Unless you can flood the entire burrow system quickly and completely, which seldom is possible, you might only stimulate the mole to tunnel in other parts of your yard.

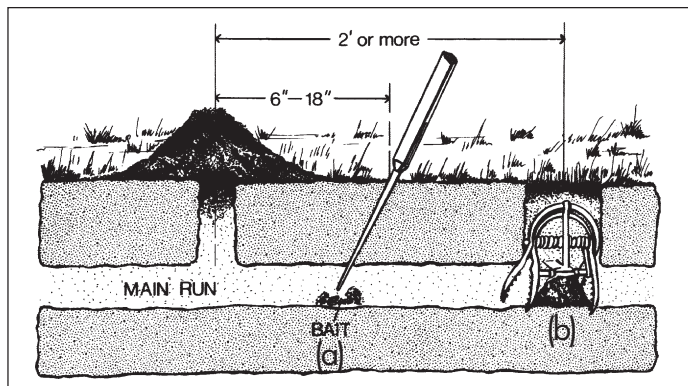


Figure 4.—(a) To bait, probe to locate a main runway, enlarge the hole by rotating the probe, remove the probe, drop bait through the probe hole, and close the hole to exclude light. (b) The proper way to set a scissor-jaw mole trap is shown. Note the trigger pan is resting firmly on a plug of dirt in the center. Sift loose soil around the trap jaws to the level of the spring, or cover with a bucket, board, or tar paper to exclude light.

Legal status

- Moles are classified as nongame wildlife under the Oregon wildlife codes and are not specifically protected.
- The wildlife codes permit a landowner or agent to control noxious animals on his or her property.
- Moles in Oregon are not protected under federal regulations.

Insecticides or soil fumigants used to eliminate earthworms and soil-dwelling insects might cause moles to move to nearby areas where this food source is more plentiful. A partial removal of earthworms might only cause moles to increase their tunneling and burrowing in search of food. Generally, this is more expensive than poisoning or trapping.

Shooting

Some farmers have found the 12-gauge shotgun an effective tool in rural areas where this method can be applied safely and legally. Drag the fields or pastures to flatten all old mounds, then simply patrol until a fresh push-up shows a mole repairing the damaged burrow system. When movement is

detected in a newly formed mound, a well-aimed blast from close range does the rest. The mole either is killed directly by the shot discharge or indirectly by concussion. A hard blow with a long-handled shovel, directed at the moving dirt pile, sometimes will accomplish the same end.

Gimmicks and gadgets

Nearly everyone has heard of a sure-fire remedy for controlling pest animals, especially moles. These include broken bottles, ground glass, razor blades, thorny rose branches, bleaches, various petroleum products, mothballs, sheep dip, common household lye, and even human hair placed in the burrow. Other devices include mole wheels, windmills, whistling bottles, and electromagnetic devices designed to frighten moles from an area.

Another supposed cure-all is the so-called “mole plant” or caper spurge, *Euphorbia lathyris*. When planted frequently throughout lawns and flowerbeds, such plants serve as living repellents. However, none of these approaches has proven to be effective in controlled scientific studies.

Unfortunately, there are no shortcuts when controlling moles. Just as in the control of other pests, success involves knowing something about the animal and its living habits,

then continuous, persistent application of effective methods and materials. Mole traps and recommended poisoned bait, properly placed, are the two most effective methods for controlling moles.

Once you have controlled damage you will want to monitor the area for reinfestation. Reinfestation is recognized easily because of mounds and surface runways. Initiate appropriate control methods as soon as mounds or surface runways appear.



Use pesticides safely

- Wear protective clothing and safety devices as recommended on the label. Bathe or shower after each use.
- Read the pesticide label—even if you’ve used the pesticide before. Follow closely the instructions on the label (and any other directions you have).
- Be cautious when you apply pesticides. Know your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.

Illustrations of mole and pocket gopher tunnels and mounds reproduced with permission from *Wildlife Pest Control*, Publication 21385, Cooperative Extension, University of California.

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