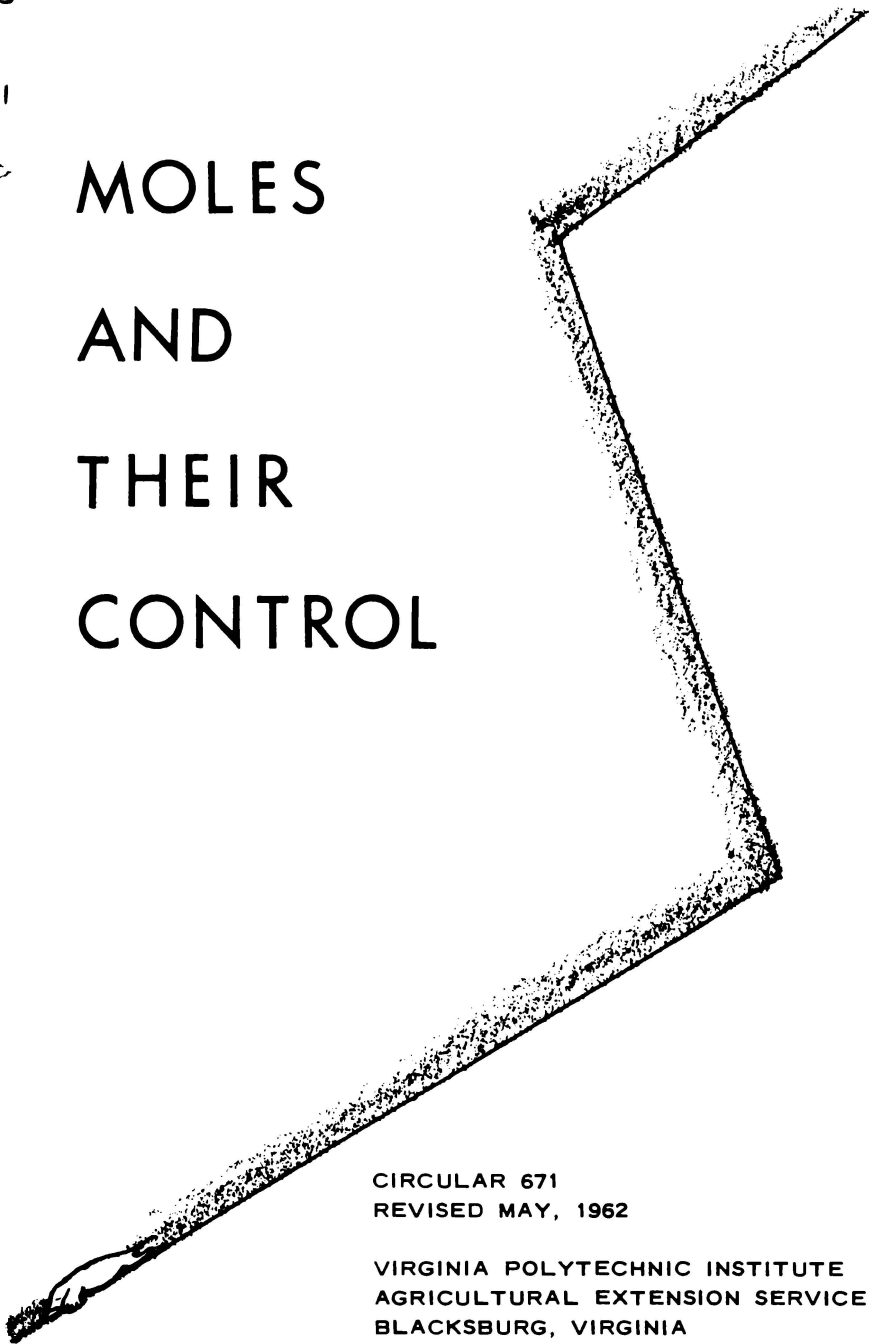


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# MOLES AND THEIR CONTROL



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## MOLES AND THEIR CONTROL

Three kinds of moles are found in Virginia. The common mole (*Scalopus aquaticus*) is by far the most numerous and widespread. A similar form, called the hairy-tailed or Brewer's mole, is found in the western part of the state. The star-nosed mole is found occasionally; its snout is divided at the tip into a many-pointed "star"

Moles are insectivores. They are not rodents. Their pointed snouts, many sharp-pointed teeth, instead of the rodent-type incisors, and the large rounded front paws with stout claws and the palms turned outward distinguish moles from mice and other rodents. They average about 6 to 8 inches in length. Neither external eyes nor ears are prominent. Shrews, their smaller relatives often caught by cats, are mistaken for moles. They are easily identified by their much smaller size—about one-half the size of the common mole or less than that. Shrews have eyes that are small but visible, and the front and hind feet are similar.

### ■ HABITS

Moles live underground, seldom venturing out of their burrows, then usually at night. The ridges of earth pushed up by burrowing plainly indicate their presence in lawns, gardens, and fields. Mounds may be pushed up at sites of deeper tunneling, particularly by the star-nosed mole. The number of tunnels is no indication of the number of moles present, for one mole may construct a maze of haphazard, criss-crossing runways. Certain main runways are used frequently; but most of the tunneling is made in a random search for food, and these paths are seldom used again. It is important to remember this point when trying to trap the animals. The more permanent tunnels commonly run along fences, plant rows, borders, and other protected places, and lead into feeding areas.

Although moles may be found in many different soil types, moist, shaded areas seem favored. Moles are most active early in the morning and in the evening. In warmer months, following rains, their activity is nearer to the surface and is more noticeable. During the winter they follow old tunnels or work below the frost line. Dry periods usually drive them deeper, as they are forced to follow food sources.

Eastern moles feed almost entirely upon animal matter that they find alive in the soil—earthworms, insect larvae, beetle grubs, and the like. Plants may occasionally form a portion of the diet of some moles, but rarely for

long. Their appetites are so tremendous that they sometimes consume a quantity equal to their own body weight in a single day. The young, from a single litter of four, are produced in the spring. They develop rapidly, feeding by themselves in one month. They are the size of their parents in two months. Their nest is a litter of dried grass in an enlargement of the tunnel.

#### ■ DAMAGE

Moles disfigure lawns and golf courses, uproot or ruin flower and seed beds, and sometimes eat seed corn and plant roots. The larger bulbs and tubers are often shredded. Most of the direct injury, however, is mechanical due to heaving up the plants, damaging the roots, and cutting off their supply of moisture.

Most of the damage to plants comes from the use of the mole runways by other animals. Mice, in particular, find the ready-made runways a source of both food and cover. The bulk of the damage blamed on moles should be charged to these animals. Usually the trespassers are far more abundant than the moles. Undisturbed tunnels may be used by rodents long after the mole has vanished. Such burrows, when found, should be flattened or broken up with a lawn roller.

#### ■ CONTROL METHODS

*Trapping* — In small, residential lawns and gardens surrounded by homes, where one or two moles have invaded the area, trapping is the most generally satisfactory method of control. Moles will burrow around or under an ordinary trap, but since they are accustomed to having their runways crushed, they will merely push away a dirt blockade to reopen a tunnel. Mole traps are designed to take advantage of this habit.

The prong or harpoon-type trap is suited for use on eastern moles. It is commonly stocked by hardware stores and other dealers in farm and garden supplies. The choker trap is also good. The claw-type trap will also catch moles when properly set in active burrows.

Locate frequently used runways. Look for active runways extending out from fences, out buildings, permanent shrubbery, or walks into the lawn or garden very early in the spring (March and April). With the foot or hand flatten a short section of each prominent tunnel ridge. Active burrows will soon be repaired—usually overnight. Runways unrepaired over a long period

of time are not active. If many ridges are present, indicating much activity, it may be necessary to roll the area first and watch for signs of new activity. Trapping at places where tunnels enter feeding areas often provides the simplest procedure. In vegetable gardens, a four-inch furrow can be plowed around the border; active runways will quickly appear and make good trap sites.

Trapping is easiest when the ground is moist and the tunnels are near the surface. Pack down a spot on the burrow for the trap. For deeper tunnels, dig the dirt with a trowel to the floor of the tunnel and then refill with a three-inch layer of dirt. The tunnel may not be centered beneath the ridge. Check its position with a wire probe. The trap must be centered on the tunnel to produce results. Set the trap in place with the trigger pan on the flattened section of the runway. When using the harpoon trap, raise and lower the prongs several times until they penetrate easily, making sure they cover the tunnel; then leave them set, ready for the next intruder. In loose soils the force of the trap spring may throw it rather than pin the mole. In such cases, spring the trap once to see if it will hold. If the trap is satisfactory reset it in the same location; if not, remove it to a new site. Always reset traps after a rain. If there is no activity after several days during warm weather, move to another runway. Directions usually come with the trap purchased. Follow them closely.

*Soil Treatment to Eliminate Food Supply* — Moles require large quantities of live animal matter for food. Removing their food will cause them to move elsewhere. When control is necessary in large areas, rural homes, or places adjacent to undeveloped areas that serve to provide a steady supply of new invaders, soil treatment to reduce the food supply offers a practical means of stopping damage. Immediate effects cannot be expected. Several months may elapse before all activity ceases and the moles go elsewhere in search of food. It is not necessary to treat large blocks of ground if the moles are not living in the middle of the area. A buffer zone of about 20 to 40 feet around the edge of the area to be protected will usually discourage further penetration. Chlordane, dieldrin, and arsenate of lead have given the best results with this technique. These poisons will be effective for about 3 to 5 years. Use with caution and read the labels carefully. Keep children and pets from the area until the chemicals have been thoroughly washed into the soil. Apply just before a rain, or water the area with a hose. Do not use if run-off will drain into a fish pond, stream, or water supply.

*Chlordane* can be purchased in the form of a 40 or 50% wettable powder, a 45% emulsion concentrate, or a 5% dust. It should be used at the rate of  $\frac{1}{4}$  lb. of the active ingredient per 1000 square feet, or about 10 lbs. per

acre. More porous soils may require slightly less than this amount. The soluble forms can be sprayed over the area to be treated. One-half lb. of 50% wettable powder, or  $\frac{1}{2}$  pint of 45% emulsion concentrate will treat 1000 square feet. Five lbs. of the 5% dust will do the same area. Apply the dust by mixing it with sand or fertilizer and spread with a fertilizer distributor. Be sure to wet it down thoroughly afterwards.

Apply *lead arsenate* at the rate of 10 lbs. to 1000 square feet of area. It can be sprayed or applied dry as suggested, with chlordane, following the same precautions.

*Dieldrin* is now available in a granular form which is easily applied by the fertilizer spreader. Use it at the rate of 2 lbs. of the active ingredient per acre.

Other chemicals are not recommended at the present time. DDT, while effective against beetle grubs and most other soil insects, does not give good control of earthworms, a staple food of moles.

*Deterrants* — Small seed beds can be protected against invasion with a curtain wall of  $\frac{1}{2}$ -inch mesh hardware cloth extending 2 feet below the surface and projecting at the base at least 10 inches in the form of an "L". However, since moles may occasionally tunnel deeper the barrier is not infallible.

*Poisoning* — This method is difficult because of the feeding habits of moles. Requiring live animal matter for the most part, attractive baits are hard to prepare. Moles appear to be suspicious of foreign matter introduced into their runways, ignoring the baits or even forcing them back on the surface where they present a hazard. Some commercial baits, consisting of thallium-treated peanuts, have occasionally given good results. Follow label directions carefully. Always plug the opening made in a tunnel.

*Other methods* — Most other techniques for destroying moles are ineffective, often valueless. Gassing rarely produces results because of the great extent of the burrow system. Some can be more damaging to roots and plants than are the moles. Flooding with the garden hose may sometimes drown young in the nest, but rarely bothers the adults. Repellents, such as moth balls and naphthalene flakes, and caustics such as lye, may cause the construction of detours. Despite contrary opinion, the castor bean plant has no value as a repellent. Sometimes, after rains, moles can be detected at work and dug out with a shovel.



FIGURE 1

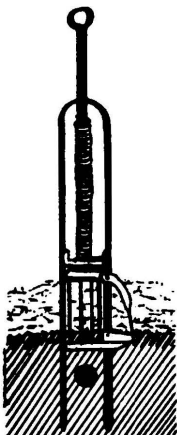


FIGURE 2

#### ■ THE HARPOON OR PLUNGER TRAP

Flatten a small section of the runway with the hand or foot to make a base for the trigger pan (figure 1). Set the trap in place with the trigger pan on the flattened runway. Raise and lower the prongs of the trap until they penetrate easily, making sure they cover the tunnel. Leave it set, ready for the first intruder (figure 2).



FIGURE 3



FIGURE 4

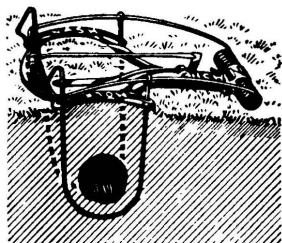


FIGURE 5

#### ■ THE CHOKER TRAP

Press down a small section of the runway lightly (as in figure 1) to make a base for the trigger pan. Make slits in the ground for the loops (figure 3). Set choker loops in the slits so that the loops encircle the runway. Be sure that the bottoms of the loops are at least an inch below the original passage (figure 5).

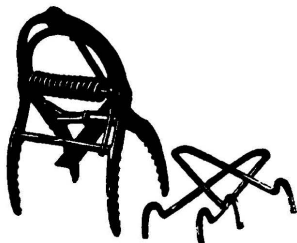


FIGURE 6

#### ■ THE CLAW-TYPE TRAP

The claw-type trap (figure 6) is set by using the same steps as for the choker trap. Take care to get the ends of the claws below the path of the mole. Handles are provided to assist in setting the trap.



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