Wildlife Damage Management Fact Sheet Series

Moles

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Moles are small, insect-eating mammals that are highly specialized for living underground. Unlike voles, moles have very small eyes, no external ears, a hairless, pointed snout, and forefeet that are enlarged and turned outward for digging in the soil.

The two commonly encountered species of mole in New York State are the star-nosed mole (*Condylura cristata*)

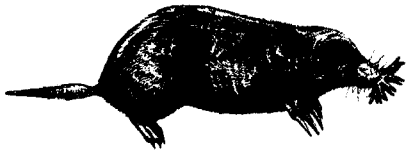

Fig. 1. Star-nosed mole

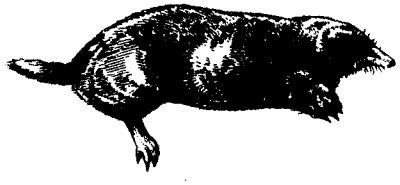

Fig. 2. Hairy-tailed mole

Fig. 3. Eastern mole

(Fig. 1) and the hairy-tailed mole (*Parascalops breweri*) (Fig. 2). The eastern mole (*Scalopus aquaticus*) (Fig. 3) may occur in the lower Hudson River Valley and Long Island. All three species have short, thick, dark velvety fur that lies flat in either direction as the mole makes its way through a burrow system. The hairy-tailed mole, found throughout New York, grows up to 5 1/2 inches long and has a short, hairy tail. The star-nosed mole, which also can be found throughout the state, reaches 5 inches in length. Its nose is surrounded by 22 small, fingerlike projections, which readily distinguishes it from other moles. The eastern mole grows up to 6 1/2 inches long and has a naked tail.

General Biology

Moles spend most of their lives in extensive systems of underground tunnels where a circular nest chamber is excavated and lined with leaves and grass. They produce a single litter of three to seven young each year in April or May after a gestation period of about 42 days. Young moles leave the nest in four to five weeks.

Habitat and Food Habits

Moles are primarily insectivorous, feeding on insect larvae (including grubs), earthworms, or other invertebrates encountered while digging in the soil. They must consume 70 to 100 percent of their body weight each day to supply energy for burrowing through the soil. Therefore, moles can be very beneficial mammals because they remove many damaging insects and grubs from lawns and gardens. Occasionally, moles may feed on seeds, roots, or bulbs.

Moles prefer loose, moist soil in fields and woods shaded by vegetation. Hairy-tailed moles tend to occupy fairly well-drained but moist sandy loam, whereas

Fig. 4. Volcano-shaped mounds made by a star-nosed mole and surface ridges indicative of hairy-tailed or eastern mole activity.

star-nosed moles tend to occur in low, wet ground especially near open water. Burrow systems are either shallow or deep. Deep systems are fairly permanent, located 6 to 24 inches below the surface, and are used for cover and for raising young. Shallow systems are more temporary, and moles use them as runways while they forage just below the soil surface.

Description of Damage

Burrowing moles occasionally damage lawns, gardens, and golf greens, uprooting plants as they tunnel through the soil in search of food. Star-nosed moles dig deep tunnels and can leave volcano-shaped hills of soil as large as 6 by 12 inches wide (Fig. 4). Hairy-tailed moles and eastern moles burrow close to the surface, and ridges in the soil surface are indicative of their activity.

Laws and Regulations

Moles are classified as unprotected animals in New York State.

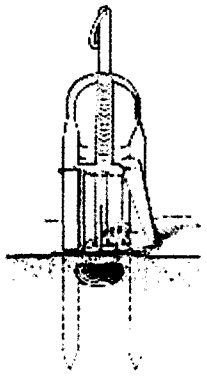

Fig. 5. A harpoon trap set properly over a surface runway.

Preventing Damage

Population Control

Because moles are not prolific breeders and do not occur in high population densities, removing just one or two individuals will often solve damage problems. The best time to conduct mole control is in the spring and fall when soil moisture levels are higher but the ground is not frozen. The most effective control is special body-gripping traps designed to trap moles as they move through their tunnels. Harpoon-shaped or scissor-

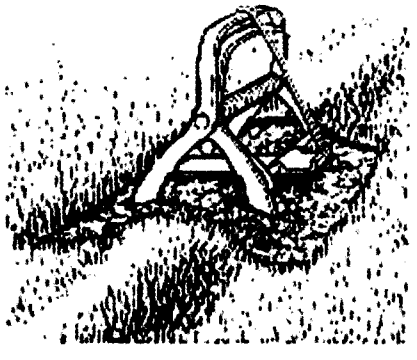

Fig. 6. A scissor-type trap set straddling the surface runway.

jawed traps of several types are available in garden stores (Figs. 5, 6).

Before setting a trap, locate a surface tunnel that appears to be active. Depress part of the tunnel with your foot and return the following day. If the tunnel has been repaired, then it is an active tunnel and a suitable place to set a trap. If the tunnel has not been repaired it is probably inactive. Once you have found a suitable location, depress a portion of the tunnel with your foot again and set the trap over the depressed area. As the mole moves through the tunnel it will push upward on the depressed tunnel roof and trip the trigger of the trap. Covering traps with an inverted bucket can conceal them and prevent tampering.

Toxicants and Repellents

Several different toxic products, including Agway Mole Stop, Mole and Gopher bait, and Revenge Mole and Gopher bait, are available commercially and legally registered for use against moles in New York State. The active ingredient in all of these products is zinc phosphide, a restricted-use pesticide that may be sold to and applied only by certified pesticide applicators. Zinc phosphide baits often are ineffective because moles prefer to feed on invertebrates rather than baits. Always check the label on any pesticide to make sure it is registered for use on lawns, golf courses, or other areas of interest.

Several repellents are also legally registered for use against moles in New York State. These products, which include Mole Med, Shotgun Mole repellent, and Scoot Mole Evacuator, all contain castor oil as the active ingredient and are not toxic. Mole-Med effectively repelled moles from 25 of 26 lawns during a study at Michigan State University. These repellents act as an irritant to moles and must be watered into the lawn.

Thiram bulb dip may protect plants from moles for a couple of weeks or until heavy rains. Bulbs must be dipped in 20 percent thiram before planting.

Use of insecticides on lawns to reduce the food supply of moles is not recommended. Although insecticides may reduce availability of food in light, sandy soils, they may have little effect in heavy clay soils. In addition, treatment of a single lawn or small area will be ineffective because moles may still burrow through the treated area in search of food. Moles may also move into the area from adjacent untreated areas. Routine use of insecticides on lawns for "prevention" purposes may kill predatory insects that keep lawn pests under control naturally and should thus be avoided. Use appropriately labeled pesticides to manage insect problems, not for controlling mole damage.

Exclusion

For small areas such as seed or ornamental beds, a 24-inch-high sheet metal or hardware cloth fence can be installed. Bury the fence at least 12 inches underground and bend the bottom out at a 90-degree angle.

Cultural Practices

Moles are often found in low, moist areas in a lawn. Improving soil drainage may reduce invertebrate numbers and, subsequently, mole abundance.

Reference

Henderson, F. R. 1994. "Moles." In *Prevention and Control of Wildlife Damage*. S. Hygnstrom, R. Timm, and G. Larson, eds. Lincoln: University of Nebraska Cooperative Extension. 822 pp.

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Figs. 1, 2, and 3 by Nancy Haver, commercial artist, Amherst, Mass. Figs. 4, 5, and 6 by Iowa State University Extension Wildlife Programs.

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