



Mole

Ecology & Damage Management



Common mole

Moles are common in Wisconsin, although they are rarely seen. They make their presence known by the raised tunnels and mounds of soil they make in lawns, gardens, fields and pastures. There are two species of moles in the state: the common (also known as the eastern or prairie) mole (*Scalopus aquaticus*), which is found mainly in the western and southern part of the state, and the star-nosed mole (*Condylura cristata*), which is found primarily in the northern half.

DESCRIPTION/HABITS

The common mole and the star-nosed mole are both small, stout mammals about 7-8 inches long. They have small, poorly developed eyes and ears. In the hand, you can distinguish moles from other small mammals by their soft velvety fur and huge, flattened front feet equipped with large broad claws for digging. The common mole is silvery gray, while the star-nosed mole is charcoal gray to black. The star-nosed mole is readily identified by the fleshy tentacle-like projections on the tip of its nose that give it its name.



Common
(or eastern or prairie)
mole



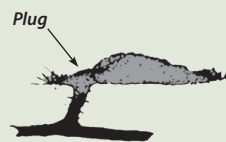
Star-nosed
mole

Moles are insectivores and may be confused with shrews, another type of insectivore. Moles and shrews are closely related, but are not alike in habits or appearance. Moles also are often confused with mice, but they are not rodents.

Moles lack the long curved incisor teeth of rodents, and instead have small sharp teeth suited to their diet of insects, grubs and worms. Both mole species have short tails compared to mice; the prairie mole's is 1-1½ inches long and the star-nosed mole's is 2-3 inches long. (continued on page 2)

Do not confuse moles with pocket gophers!

Pocket gophers also live in western Wisconsin. The damage they cause is more severe and widespread than that of moles. Tunnels visible as raised ridges are the work of moles. A mole "hill" results when a mole pushes soil up and out of a tunnel through a vertical shaft. This creates a circular mound with round "ripple marks" made by each new load of soil that is pushed out, resembling a volcano of soil (see illustration). In contrast, gopher mounds result from soil that has been pushed in one direction from a slanted shaft. It tends to be heart- or fan-shaped and the hole is usually plugged with soil. Gopher tunnels are not visible at the surface.



Gopher tunnel
and mound



Mole tunnel
and hill

DESCRIPTION/HABITS (continued)

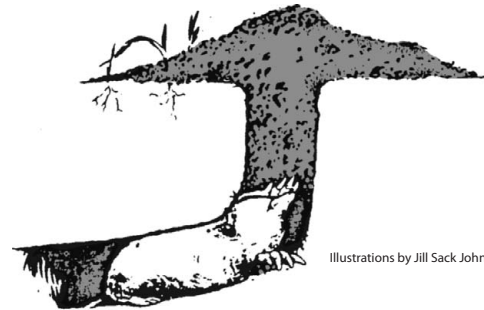
Moles tunnel and live beneath the soil surface. The star-nosed mole prefers moist soils near water. It is an excellent swimmer and can often be found in the water. Because of its habitat preference, the star-nosed mole rarely becomes a nuisance. The common mole favors drier upland soils that are loose and free of rocks. Of the two, it is the major problem species. The common mole digs tunnels at several depths and can move through loose soil with surprising speed. The surface tunnels seen in lawns and open areas are feeding tunnels. The mole nests and lives in tunnels 6-18 inches beneath the surface.

“You may only need to eliminate one or two individuals to solve what looks like a major problem.”

An abundance of mole mounds and tunnels suggests that there is a large population present. This is not necessarily so – three to five per acre would be considered a high density of moles. Moles are not as abundant as mice and some other small mammals. Thus,



Only moles tunnel near the surface of the ground leaving raised ridges of soil or pushed-up soil.



Illustrations by Jill Sack Johnson, 1989

Mole pushing dirt through tunnel onto surface.

you may only need to eliminate one or two individuals to solve what looks like a major problem.

Furthermore, as soil moisture changes, moles may disappear or reappear as they move down or up, respectively, in the soil column.



Scott Craven

Mole mounds and tunnels.

MOLE PROBLEMS

Moles are often blamed for the destruction of bulbs, seeds and garden plants. In fact, moles rarely consume plants or plant parts, although they will occasionally take a few seeds. They dig their tunnels in search of earthworms, grubs and other small creatures of the soil and leaf litter. Mice, ground squirrels and insects are the usual culprits, because they inhabit the mole's network of tunnels, feeding and gnawing on plants.

However, moles are not entirely guiltless. Their raised tunnels are unsightly, particularly in well-manicured lawns in parks, golf courses and yards. The tunnels can interfere with mowing and expose roots to air, killing

the grass and leaving a yellow, twisting strip in an otherwise green lawn. Plants are frequently killed when a mole tunnels directly under a row of garden seedlings. The action is not malicious; the mole merely finds the going easier, and more moisture and food in the freshly cultivated soil.

Moles feed on both beneficial creatures, such as earthworms, and on harmful vegetable pests like grubs and other insect larvae or adult insects. Moles are not a problem during the winter because they dig deeper in the soil to get below the frost line.

DIRECT CONTROL – TRAPPING

Trapping is an effective and efficient method of mole control in terms of time and cost. At first glance, the highly specialized mole traps that are available look brutal and dangerous to the user. In fact, the sudden death of the mole in such a trap is quite humane, and a reasonable amount of caution will prevent accidents to the trapper, children, and pets.

You will have better trapping success if you are mindful of moles' habits and behavior. For instance, a mole will become suspicious if its sensitive nose encounters something foreign in its runway. It's likely to back up and burrow around or under a foreign object set in its tunnel. But it won't be suspicious of dirt blocking a runway because farm machinery, people and animals frequently close burrows. A mole will usually push its way through such a dirt blockade and continue on its way.

This habit of opening collapsed sections of tunnel makes the animal vulnerable to specially designed traps that straddle or encircle the runway – or are held suspended above it- with the trigger pan resting on, or hidden in, a dirt blockade. With this arrangement, the unsuspecting mole can't detect the trap. In retunneling through the dirt obstruction, the mole lifts the trigger arm, causing the trap to release, thereby killing the offending individual.

Two good traps for catching moles are the body gripping type and the harpoon type. These traps are available at most garden supply or hardware stores or through garden catalogs. They are about equally effective. The harpoon

type is more popular than any of the various styles of body gripping traps because it is more easily set.

Remember, a mole is extremely sensitive to anything unnatural in its environment. Never tear up large sections of a mole burrow trying to locate a good spot for a trap. A poorly set trap is a detour sign for a wary mole.

Selecting a Trap Site

Another key to trapping moles is to place your trap in a frequently used tunnel. Traps must be placed in hunting, or main runway, tunnels, which are close to the surface and recognizable by their conspicuous ridges. Remember that these surface tunnels are made for the primary purpose of finding food. Many of them are not used more than once, while others serve as regular travel routes. Ordinarily, a tunnel that takes a more or less straight course for some distance, or seems to connect two systems of tunnels will be used frequently. On the other hand, a tunnel that has mouse holes or other openings is not being used; moles repair such surface openings. You can identify tunnels in use by poking small holes in them or by stepping on them and determining the next day which ones have been repaired.

“You can identify tunnels in use by poking small holes in them or by stepping on them and determining next day which ones have been repaired.”

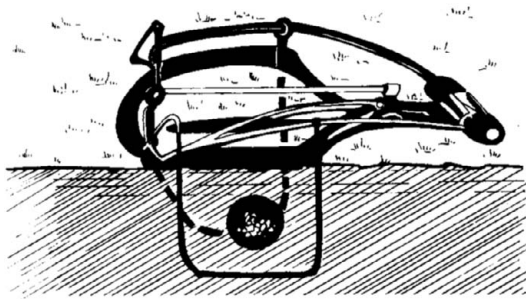
To set a choker trap:



Make an excavation across the tunnel.



Place set trap so jaws evenly straddle course.



Block section with damp soil, settle trap, and fill with loose dirt.

Illustrations by Jill Sack Johnson, 1989

Setting a Choker Trap

In setting a choker trap, it is usually necessary to make an excavation across the tunnel. Dig a little deeper than the tunnel and just the width of the trap. A garden trowel is handy for this. Note the exact direction of the tunnel and place the set trap in line with the tunnel so that its jaws evenly straddle – or its loop encircles – the tunnel runway. Block the excavated section with loose, damp soil from which all gravel and debris have been removed. Pack the soil firmly underneath the trigger pan with your fingers and settle the trap so that the trigger rests snugly on the compacted soil. Finally, fill the trap hole with enough loose dirt to cover the trap even with the trigger pan and to exclude all light from the mole burrow. If the trap fails to produce after two days, it can mean:

- 1) the mole has changed its habits,
- 2) the runway was disturbed too much and the mole avoided it, or
- 3) the trap was improperly set and didn't fire or was detected by the mole.

In any event, move the trap to a new location along a hunting, or main runway tunnel.



Scott Craven

Harpoon trap.

Setting a Harpoon Trap

To use a harpoon trap (see illustration), merely pack down the runway tunnel ridge with your foot and push the set trap (with safety catch in place) into the ground so that the trigger pan rests snugly on the depressed ridge and the two pointed supports straddle the tunnel evenly. Release the safety catch, and the setting is complete. If the ground is hard or gravelly, spring the trap once to make sure that the impaling spikes easily penetrate into the soil for their full length. If they do, reset the trap without changing its position. If they don't, select a new place along the runway.



Pack down the runway ridge and push the set trap into the ground with trigger snugly on depressed ridge.

Illustration by Jill Sack Johnson, 1989

DIRECT CONTROL – POISONED BAIT

Poisons are often promoted as the solution to a mole problem. Peanuts, grains or other non-animal food materials are used as carriers for the poisons. However, since moles feed almost entirely on insects and worms, they do not readily take the poisoned baits. The result is poor control in most cases. A possible exception is a product marketed under the brand name Talpirid™ for commercial applicators or Tomcat® Mole Killer for homeowners. Talpirid™/Tomcat® Mole Killer is an example of a general use pesticide, meaning it is available to the general public. It is bait in the form of manufactured worms (like “gummy” worms), which are inserted into a mole’s tunnel and, upon ingestion, kill the mole within 24 hours. Talpirid™/Tomcat® Mole Killer has shown promise in effectively controlling moles, but independent scientific evidence is still being collected.

Other pesticides are restricted use and are only available for purchase and use by those who have obtained a pesticide applicator license. Restricted use pesticides are generally more toxic than general use pesticides, pose greater risk to non-target wildlife, and are best

left to professional and trained pest control staff. An example of a restricted use pesticide is strychnine. Strychnine is available as treated bait in the form of a peanut, but both purchase and use permits are required. Besides, peanuts are not a preferred food source of moles; therefore, bait acceptance and control of the mole problem are uncertain.

Mole poisons sometimes give a false impression of being effective merely by causing moles to abandon surface tunnels. This might happen if a mole is frightened by the disturbance associated with placing poisoned baits or the odor of the baits or if the poison kills the mole’s food supply. Dry weather also sometimes forces moles into deeper tunnels in search of food.

“Since moles feed almost entirely on insects and worms, they do not readily take the poisoned baits. The result is poor control in most cases.”

DIRECT CONTROL – FUMIGATION

Gas cartridges can sometimes be used successfully to fumigate a mole’s tunnel system, although some cartridges can be difficult to install because the diameter is larger than the size of the tunnel opening. Cartridges should be lit and inserted quickly into the tunnel, one every 15-20 feet, and the tunnel sealed with a piece of sod. Cartridges are available at some hardware stores and garden centers. The moles will

be killed if you are lucky enough to catch them in their surface tunnels while you are fumigating.

When using either poisons or fumigation carefully read and follow all label instructions for safety and best results. For example, fumigants should not be used where there is a risk of gas from the fumigant leaking into a human residence.

INDIRECT CONTROL

A serious mole problem indicates that moles have an abundant food supply. If the food supply can be eliminated or reduced, the moles will be forced to leave the area. There are several pesticides available that will kill white grubs (June beetle larvae), other insects and even earthworms. One of the most widely used pesticides, Diazinon, has been banned. Inquire at an Extension office or garden center about an appropriate pesticide.

Alternatively, biological controls like beneficial nematodes or milky spore disease can be tried. The microscopic nematodes are mixed with water, which is then used to water the lawn; milky spore dust is sprinkled on the lawn at a rate of 2 pounds per acre. The nematodes outcompete moles for food sources like grubs, but do not eat other insects and worms that are good for the soil. The milky spore disease kills certain white grubs. However, because the nematodes

and milky spore disease don't affect worms, a favorite food of moles, there is no guarantee that these biological controls will work if your lawn contains both grubs and worms.

There are other disadvantages to this approach. First, the necessary chemicals may be expensive, relative to other control options. Second, there is a delay of several weeks before any



effect on the moles can be expected. Third, chemical control may harm beneficial creatures such as earthworms and may be detrimental to some ground-feeding birds like robins, by removing their food supply.

Despite these problems, indirect control may be useful on valuable property where moles are a constant threat, such as golf greens.

REPELLENTS

A plant called “gopher purge” or “mole plant” (*Euphorbia lathyris*) has been advertised in Wisconsin as a way to repel gophers and moles from a large area. The effectiveness of this plant has not been substantiated, and there is a possibility that it could become a problem weed. It is also poisonous to humans.

Recently, a number of chemical repellents have become available. Most are based on castor oil formulations and are easily applied with a hose-mounted sprinkler.

Follow label directions for best results. The effect on the moles is unclear, but under good soil moisture conditions moles may vacate a treated area for a month or more. Products can be purchased in a variety of container sizes. A pint of several of the common repellents is said to cover 5,000 square feet of turf.

You may also search the internet for a home formulation using castor oil, which is readily available at drug stores.

MISCELLANEOUS MANAGEMENT PRACTICES

Assorted other management practices have been attempted to rid an area of moles, with mixed results. Moles are most often found in soils that are loose and organic. Compacting soil with a weighted roller or reducing soil moisture by minimizing lawn irrigation have the effect of making it more difficult for moles to

tunnel through soil. These techniques may work in limited areas but may have detrimental effects on vegetation due to compaction of root zones and reducing available moisture. Some ultrasonic and soil vibration devices are available commercially. These devices can be costly and are of questionable effectiveness.

Mole Ecology & Damage Management

This fact sheet is part of a series designed to help you successfully manage wildlife damage problems on your property. The series includes additional publications which focus on controlling damage from specific animals, plus an introduction to wildlife damage management.

MORE INFORMATION

For more information, contact your county UW-Extension agent.

For further reading: *The Mammals of Wisconsin* by H.H.T. Jackson, which is available in most bookstores and libraries.

The illustrations and much of the information about trapping techniques in this publication came from *Controlling Nuisance Moles* by F. Robert Henderson, Cooperative Extension Service, Kansas State University.

Via the internet, you can find information, supplies, handouts, pictures, and other resources on moles and damage management relative to moles. An internet clearinghouse offering scientifically based information on wildlife damage management is the Internet Center for Wildlife Damage Management (icwdm.org). The Internet Center for Wildlife Damage Management is a collaboration between Cornell University, Clemson University, the University of Nebraska, and Utah State University.

This publication is available in pdf format at: wildlifedamage.uwex.edu

Copyright © 2012 by the Board of Regents of the University of Wisconsin System doing business as the division of Cooperative Extension of the University of Wisconsin-Extension. All rights reserved. Send copyright inquiries to: Cooperative Extension Publishing, 432 N. Lake St., Rm. 227, Madison, WI 53706, pubs@uwex.edu.

Authors:

Scott Craven, UW-Extension Wildlife Specialist/Professor

Department of Forest and Wildlife Ecology, University of Wisconsin-Madison

David Drake, UW-Extension Wildlife Specialist/Associate Professor

Department of Forest and Wildlife Ecology, University of Wisconsin-Madison

Cooperative Extension publications are subject to peer review.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914, Acts of Congress. An EEO/AA employer, the University of Wisconsin-Extension, Cooperative Extension provides equal opportunities in employment and programming, including Title IX and ADA requirements. If you need this information in an alternative format, contact Equal Opportunity and Diversity Programs, University of Wisconsin-Extension, 432 N. Lake St., Rm. 501, Madison, WI 53706, diversity@uwex.edu, phone: (608) 262-0277, fax: (608) 262-8404, TTY: 711 Wisconsin Relay.

This publication is available from your county UW-Extension office (www.uwex.edu/ces/cty) or from Cooperative Extension Publishing. To order, call toll-free: 1-877-947-7827 (WIS-PUBS) or visit our website: learningstore.uwex.edu.

Mole Ecology & Damage Management G3997-003 I-02-2012

Graphic design by Jeffrey J. Strobel,
UW-Extension Environmental Resources Center.

