



MOLES

Homeowners get confused by all of the conflicting "advice" on mole control. It seems like anyone and everyone has their two-bits worth of mole remedies and concoctions. They'd like you to believe that every control method or home remedy is worth trying. Over the years, I made it a point to learn all that I could about mole behaviour and control. **The bottom line is simple.** Chemicals and home remedies (including castor oil, grub controls and poisons) don't work. They're not only ineffective, but allow the moles time to establish and become major problems. All knowledgeable sources consider trapping the only effective method of mole control!

When moles have been a problem for any length of time or when residential properties are bounded in any way by woodland (a mole's natural habitat), trapping is most effective when done over long periods of time.

MOLE BIOLOGY

Moles are from the family **Talpidae** which includes moles, desmans, and shrew-moles.

Moles are covered by a soft grey pelage that is hinged to allow it to move in any direction. Variegation in colour is common with patches of orange or white on some moles. Moles are about the **size** of hamsters and can weigh anywhere from three to six ounces. Total length can be six to eight inches. Moles have **one litter** each year. Litter size can be two to six depending on the health of the female. I can expect males to rut from about the last week in February through the first week in April. **Gestation** lasts about five to six weeks which means I can expect litters anywhere from mid April through May. Moles are mammal and nurse the young moles for several weeks. I look for young moles to **disperse** (newborn expanding off the mother's tunnel system or moving above ground to create or find new tunnels for their own use) from late **April through mid June**. I imagine this timing can be tempered by unseasonable extremes in temperature or ground moisture. The final dispersal can last through late autumn and early winter. Since moles **don't hibernate** (they store neither food nor fat) final dispersal can result in severe lawn damage until the lawn surface freezes in winter. Newborn females will mate the following spring and the cycle begins anew.

AMAZING CHARACTERISTICS

Because of specialized bone and muscle construction, moles can exert a lateral digging force equivalent to 32 times its body weight. As a comparison, a 150 lb. man would be able to exert a 4800 lb. lateral force.

"For moles to dig one metre of tunnel requires between 400 and 4,000 times as much energy as does walking for the same distance on the surface."

A 5 ounce mole will consume 45 to 50 lbs. of worms and insects per year.

A moles surface tunnelling or probes can be dug at about 18 feet per hour. A moles speed through existing tunnels is about 80 ft. per minute.

Moles contain twice as much blood and twice as much red haemoglobin, as other mammals of similar size, allowing the mole to **breathe easily in its underground environment of low oxygen and high carbon dioxide.**

TUNNELS & BEHAVIOR

"Moles are believed to remain solitary as adults and avoid contact with other moles". However, there are at least two exceptions. One occurs in the spring, when the males start to move around and leave their range in search of females. They may move about for several weeks, even after all the females in an area have mated. The other exception is that occasionally some tunnels are used by several moles; these tunnels are, in a sense, like highways. This communal use suggests that the **social system of moles** is more complex than we think."

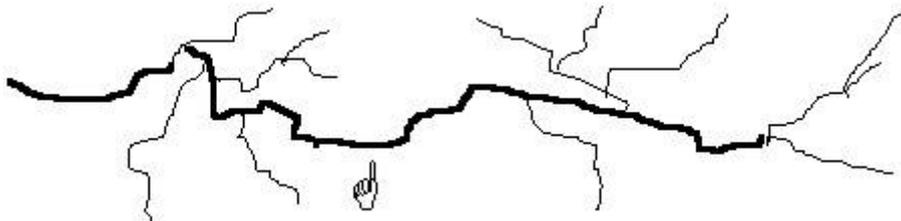
These two statements seem to lend a mystic quality to moles and their behaviour but moles are creatures of habit and they do behave in fairly predictable ways depending on what they have and what they need. There are a couple of traits that need mentioning before I get into tunnels. The first is that moles will usually take the path of least resistance when tunnelling. This is great food for thought the next time you look at a maze of mole tunnels and mounds and wonder why moles do what they do. The second trait reinforces the first in that moles are re-colonizing animals and will readily take over existing tunnels or jump home range. Simply put, trapping the moles that are currently damaging your lawn or landscaping may **not be an end-all** or permanent solution to a mole problem. Because re-colonization is likely, trapping is the only way to keep up with a mole problem. Because mole tunnelling and damage is generally progressive (moles continually adding on new tunnels to the old year after year) the amount or kind of lawn damage at any given time is **not indicative** of the number of moles present. Current damage also can give no indication as to the number of moles that will have to be trapped out.

Most experts describe two tunnel types.

1. **Surface-** (probe or **gathering**)
2. **Deep** (**permanent** or producing). These can be broken down into sub groups;

Surface: Exploratory - Mole population adding onto or expanding system. Male mole rutting pattern (last week in Feb. through end March)

Gathering: - As certain biomasses increase seasonally, such as grub or worm concentrations in spring or autumn. (Noticed as a literal pumping-up of fairly large areas) These tunnels resemble varicose veins and seem to stem-out in all direction. (A surface feeding area). The damage is heavy and will come and go seasonally. A permanent tunnel may be constructed to connect these feeding areas.



Deep or permanent tunnels: bolt runs and producing are not too deep. These tunnels are usually placed along or under man-made borders such as timbers or foundations. Bolt runs will connect two feeding areas and will appear fairly straight. (The shortest distance between two points). They may also be deeper and show up as a series of mounds in open areas. The producing tunnels do just that, they produce biomass throughout the year.

Deep producers are indicated by heavy mounding in a small area, such as around tree roots in residential areas. In a natural habitat, the mounding is difficult to see because of woodland debris. The large mounds of



dirt associated with deep producers are a result of clay displacement in and around the roots. Some of the producers will eventually work around the root balls of the trees and allow access to the biomass throughout the year, as many insects or larvae live off of the root moisture and sap.

A complete tunnel system will always connect a combination of all of the tunnel types as well as one or two areas that I can only describe as wet and dry. The wet will hold water and is used during dry periods. The high feeding areas will drain quickly and provide access to biomass during torrential or wet periods associated with spring and fall rains.

A mole problem left unattended can reach a stage of complete access for moles, in that over a period of years, the tunnelling can reach all areas of the lawn and residence. The tunnels are produced slowly along organic lines such as fence rows, manmade borders, tree lines or mulched areas. The resulting system can supply a large and permanent bio-mass that can feed several moles. Effective trapping can remove the resident moles, but the large system can entice other moles to follow. Moles will usually take the path of least resistance, so the empty tunnels make access easy. Moles can and will jump home range easily. If the tunnels provided for the moles that constructed them, they'll also provide for new moles that happen upon them. It's called re-colonization and seems to be a crucial part of mole behaviour.

The energy required to construct a permanent tunnel system is great. To protect this investment moles **scent mark** most of the home range daily as they travel through the system in search of food. It warns other moles that the system is occupied (protecting territory) and may advertise a female's scent when she is ready to mate. The scent can be picked up by a rutting male, crossing marked tunnels.

Mole Control

Moles can drive you nuts! If you're like most homeowners, you're probably confused by all of the conflicting "advice" on mole control. You believe every rumour, home remedy or control method is worth trying. In fact, chemicals and home remedies are not only ineffective when dealing with moles, they allow the animals time to establish and become real problems. Moles are woodland animals in nature, but can quickly colonize and spread through adjacent residential properties if not handled properly. Since they need a well-established tunnel network to survive, the longer they're allowed to tunnel, the more habituated they become and difficult to control. **Trapping is the only effective method of control.** It is literally a war of attrition.

Since few homeowners bother to trap moles, large mole populations can develop in residential areas. It seems odd to me that in spite of all knowledgeable sources advocating trapping as the only reliable approach to a mole problem, we're still pouring on the chemicals, pumping the soil full of gases, snapping up sonic noise makers and trying age old home remedies that never have worked.

The common mole is an insectivore, **not a rodent.** Its diet is restricted to ground invertebrates such as grubs, millipedes, ants and the like. However, **the mole's primary food source is earthworm,** so trying to control white grub and lawn insects is no protection from mole activity. The activity in certain lawns can simply come and go throughout the season. On large properties the activity may gypsy from one part of the lawn to another. This movement or migrating is controlled by climate and ground moisture. Moles will adapt to changes in food supply and source as different insects become available in different places and at different times throughout the year. Moles will jump home range and readily re-colonize other existing or deserted tunnels. Moles may leave an area if disturbed but will usually return when you least expect it. Even without disturbance mole activity may last only a week or two in a particular area. This here-now gone-tomorrow behaviour is probably the root of most of the **subjective misconceptions** that make some home remedies including moleicides appear credible.



Subjective misconceptions are also the root of such remedies as pickle, broken glass, red pepper, razor blades, bleach, moth balls, rose branches, human hair balls, vibrators, ultrasonic contraptions, castor oil, gasoline and explosives. Although this fun and games approach may relieve frustrations, these and other **home remedies have little if any value in controlling moles.**

Moles are problems in residential properties because of:

1 - **Restrictions on or loss of habitat** through construction, drainage changes and possibly chemical runoff into the mole's natural habitat. (Moles are woodland animals. Suburban construction gobbles up or modifies hillsides and pastureland, leaving little or no room for woodland creatures. Combinations of pesticides, herbicides, and fertilizers as chemical runoff may directly affect surrounding woodland biomass restricting the mole's natural food sources.)

2 - **Artificial biomasses** created and maintained through current landscaping practices. Most landscaping depends on artificial or chemical means of maintaining lawns and beds. These soils are kept rich with chemical nutrients as well as heavy applications of organic materials such as mulch and top soils. Watering or irrigation is common as well as the use of manmade borders, edgings, and other appointments such as timbers and stones; all super environments for worms and insects. Whether natural or unnatural, this type of landscaping provides a perfect food source (insects) for moles.

3 - **Unreliable methods of control.** The mole has an unusually low birth rate for a small mammal. Litter sizes are three to four pups once a year. Natural survival rate is less than half in the wild and we have a problem with moles?

There are no chemical solutions to a mole problem and trapping is the most reliable method of control. Mechanical traps are environmentally friendly, target specific and they work! Some traps are good, some are not.

"Trapping is the surest and, so far as my experience goes, the most practical method of getting rid of moles."

Many years have passed and knowledgeable advice on moles remains the same. **When moles are a problem, TRAP!**

TRAPPING & TRAPS

Deciding where and how to set mole traps is generally a problem for the homeowner. Some basic biology and behavioural information is a plus. Hands-on help seems to work best but trial and error and a lot of persistence can also produce good results. **Permanent** or deeper tunnels will be the most productive since these tunnels may be used several times daily by the moles. To identify main runways in an area, look for constantly reopened tunnels which follow more or less a straight course for some distance or that appear to connect two mounds or two feeding areas. Main runways will follow fence rows, walkways, foundations, or other man made borders. Main runways will occasionally work along woody perimeters of a field or lawn. Rambling tunnels in the lawn are probes of a sort and are quickly constructed by moles at about 15 to 18 feet per hour. They may or may not be reused. **See Biology- Tunnels & Behaviour.**

You can trap moles anytime of the year, but I've found that early autumn and early spring are the most effective times. Populations are normally lower, and damage is most visible then, before lawn grasses grow too tall in the spring or are covered with leaves in the autumn. Early autumn trapping eliminates moles before they move deeper for the winter and begin to reopen old tunnels and throwing up new mounds. Trapping in early spring, before new litters are born, prevents a lot of trouble later. Moles may seem to



vanish during extended cold or dry periods, but they've just gone deeper. And because they're using fewer tunnels during these adverse conditions, trapping can be very effective, though difficult.

Mole traps work because moles usually try to reopen a blocked tunnel. The trapper obstructs the tunnel and sets the trap trigger against the obstruction. As the mole clears the tunnel, it pushes up on the trigger pan, releasing the spring and is crushed by the trap

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Date; 28Th February 2012