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Controlling Field Voles (Field Mice)

Purdue University Cooperative Extension Service

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controlling FIELD VOLES (Field Mice)

Field voles can cause damage to Christmas trees, fruit trees, ornamental shrubs, and nursery stock resulting in severe economic losses to growers. Voles damage trees by root pruning and/or trunk and root girdling. Damage usually occurs during the winter months when other food is scarce. However, green-barked young trees and shrubs may be gnawed even in summer. Trees planted in old fields are more often attacked by voles than under clean cultivated conditions. Damage is most likely to occur during the first ten years of establishment. As grass and weeds are crowded out by tree growth, the planting becomes less habitable for voles.

Three species of voles may be present; meadow, prairie, and pine voles. Identification is necessary since control methods and materials are not equally effective for all species.

The easiest way of telling adult voles apart is by the length of their tail. A pine vole's tail is not longer than its hind foot. A prairie vole's tail is 1 1/2 times longer than its hind foot. A meadow vole's tail is 2 1/2 times longer than its hind foot.

Juvenile pine and prairie voles can be easily confused because a young prairie vole's tail is almost the same length as its hind foot. Bog lemmings may also be confused with pine voles (both have very short tails). However, bog lemmings have broad grooved upper incisors. The upper incisors of the pine vole are not grooved.

Anytime there is confusion as to an animal's identification, professional assistance should be sought. This can be obtained from local county extension agents, university wildlife departments, or from the U. S. Fish and Wildlife Service.

The use of wooden-based snap traps is an ideal way of determining species. Set traps on active runways. The presence of fresh grass clippings, feces, and chewed fruit (when present) indicate activity. Abandoned runs may have fungus growth, green grass shoots, and fine roots. Place traps at right angles to the runway and at the same level. Bait with a small piece of apple and cover set, leaving enough room for proper operation of the trap.

CONTROL METHODS

Cultural Practices

Control of ground vegetation with mowers, disking, or sod-chopping machines helps limit voles by reducing potential cover for their surface runways. However, working in this manner can leave heavy cover directly around the tree base, concentrating them in these areas. Eliminate this by clearing a 3-foot radius around the base of the tree or shrub. Scalp by hand or with mechanical equipment, or kill the vegetation with chemical weed killers. Cultural practices have definite limitations. Where pine or prairie voles are involved, the destruction of surface cover may have little influence on their underground activities. In northern areas, snow can also provide cover for voles.

CONSULT STATE AND LOCAL LAWS BEFORE APPLYING CONTROLS
Tree guards are helpful in reducing summer and early fall damage and may be the most satisfactory for ornamental shrubs and trees around the home. They should be constructed from "hardware cloth" with no larger than 1/4-inch mesh. Guards should enclose the tree trunk and extend several inches below to at least 18 inches above the soil surface. Tree guards will reduce or eliminate damage caused by meadow and prairie voles, but will not stop pine voles from attacking tree and shrub roots.

Chemical Controls

Some of the chemicals listed may be restricted or not registered in some states. Therefore, check with the state pesticide office or local county extension agent before using.

Repellents

Thiram - Thiram is a repellent sprayed on plants subject to damage before the damage starts. It may protect up to 6 months, but repeated applications are necessary to protect new plant growth during the growing season. Thiram is available in different strength solutions. It is generally applied at 7 to 10 percent concentration. Consult product label for specific mixing and application directions.

Thiram should not be applied to plant parts that will be eaten by humans or domestic animals. Fruit trees may be treated with thiram in the dormant season.

Anticoagulants

Some formulations of anticoagulants are registered for use against pine and meadow voles.

Application methods and rates are similar to zinc phosphide-treated grain baits. Since consecutive multiple feedings are required to be effective, anticoagulant use in orchards or tree plantations is of questionable worth. However, around ornamentals and nursery stock where the bait can be put out in bait stations, anticoagulants may be of some value.

Single Dose Toxicants

Strychnine - Strychnine is a broad spectrum toxicant that will kill any animal that consumes a lethal dose. It is registered for meadow and pine vole control. However, it is not as effective as other chemicals, such as zinc phosphide, for controlling these animals.

Zinc Phosphide - Zinc phosphide may be used with apple cubes or grain baits. Grain baits are a must for pine vole control. Apple baits may be used when only meadow and/or prairie voles are present. Both baits or only grain baits should be used when all species are present. If both baits are used, place alternately, or by alternate rows. Treat marginal lands to prevent rapid movement of mice into the treated area.

Apple cubes are prepared by cutting firm ripe apples into 1/2-inch cubes. Place cubes in a container and sprinkle with one level teaspoonful of 63% ZINC PHOSPHIDE concentrate to each quart of cubes. Cover container, and tumble baits until evenly coated. Apple baits should be mixed just before placement and must be applied in the fall before the ground freezes. Grain baits can also be applied in the fall and are the only baits to use after the ground freezes.

Bait Application

Hand Baiting - Examine area around trees systematically. Start at the drip
line and move toward the tree trunk.
Part the heavy vegetation and look for
active runways. Place several apple
cubes or a teaspoonful of grain or pellet
bait in each active runway. Pull
vegetation back over bait placement.
Usually 3 or 4 bait placements per tree
are ample. Use about 6 quarts of apple
cubes or 10 pounds of grain or pellet
baits per acre or one half of each when
using both baits.

In general, hand baiting is not practical
for commercial tree growers. It is,
however, a good control tool for spot
treatment in heavily infested areas, pine
vole colonies, marginal areas, and for
spot treatment during the winter months.
It is, also, a good control tool for use
around ornamental shrubs and nursery
stock.

Broadcast Baiting - (Not recommended
for pine vole control.) Grain or pellet
baits may be broadcast by hand, cyclone
seeder, or tractor drawn equipment.
Avoid application to bare ground and
areas of sparse vegetation to reduce
hazard to other wildlife. Do not use
more than 10 pounds of bait per acre.

Apple cubes are best suited for hand
broadcasting. To hand broadcast, walk
down the tree row, hurling a small handful
of bait into heavy vegetation or other likely
vole cover. Two to four bait placements
per tree should be adequate. Use about
5 quarts of apple cubes per acre.

The broadcast method compares favorably
with other methods of control for meadow
and prairie voles but will not control pine
voles. It is, perhaps, the easiest and
least costly method to use, but unless the
area is covered thoroughly, control of
the vole population may not be adequate
to prevent serious damage. Special

attention should be paid to the
surrounding areas.

Machine Baiting - Machine baiting
with the trail builder is the most
practical method for controlling pine
voles. The trail builder produces an
artificial trail into which treated baits
can be dropped mechanically or by hand.
The trail builder should be used just
after harvest. Make parallel trails down
each side of the tree row at the drip line.
If both apple and grain baits are used,
place the apple cubes on one side of the
tree and grain baits on the opposite side.
Use 5 to 6 quarts of apple cubes or 6 to
8 pounds of grain bait per acre, or one
half of each when using both baits.

Good sod and reasonably moist earth
are necessary to make good trails. It
is essential that the trail builder be
properly adjusted for existing soil
conditions and the tractor be operated
at a slow speed to avoid tearing the sod.
About 20 acres a day can be treated
with this method. As with all control
methods, marginal lands, gullies, piles
of prunings, etc. must be treated if
satisfactory control is to be obtained.

Timing of Application - The most
effective period for application is just
before snow cover develops and after
the grass cover is down from frost and
the fruit rotted—usually midOctober to
midNovember. Select a warm, clear,
quiet day as the voles are most active
under these conditions.

CAUTION--When mixing baits, work
outside. Avoid breathing the dust,
and wear rubber gloves when preparing
and distributing baits. After use,
carefully wash hands and utensils.
Store toxicants, baits, and contaminated
gloves in a safe, well-ventilated place.

WHEN USING ANY PESTICIDE READ AND FOLLOW ALL LABEL DIRECTIONS.