

## 9 Wildlife Damage Management

### 9.1 Deer and Rabbits

Several commercial repellents are available to reduce deer or rabbit browsing to orchards (Table 9.1.1). The effectiveness of repellents is extremely variable and is affected by factors such as deer or rabbit numbers, feeding habits, and environmental conditions. Repellents may be cost-effective for controlling wildlife damage when:

1. Light to moderate damage is evident,
2. Small acreages are damaged, and
3. Few applications will be needed for adequate control.

If these three conditions are not satisfied, it is best to look at the cost-benefit ratios for fencing and/or state permits for removing deer

With the use of repellents some damage must be tolerated, even if browsing pressure is low. None of the existing repellents provides reliable protection for more than 5 weeks when deer or rabbit densities are high. If browsing pressure is severe, a long-term damage management program should be implemented, including potential habitat modifications, reductions in animal numbers, and an evaluation of fencing alternatives.

A landowner can use a variety of non-chemical alternatives to reduce wildlife damage to fruit trees. These techniques fall into three primary categories: exclusion, habitat modification, and wildlife population reductions. Fencing is the most common exclusion technique used to prevent damage to crops. Helpful information can be found at: <http://wildlifecontrol.info>

Habitat modifications can reduce damage levels by making areas less suitable for problem wildlife species. Damage prevention with cultural manipulations should begin with site selection and plant establishment. Removal of brush, stone piles, and non-mowed wet areas in and near orchards, will reduce the attractiveness of sites to rodents and rabbits. Mowing in established plantings can reduce preferred foods of wildlife, remove protective cover, enhance predation, and expose animals to severe weather conditions. Sites adjacent to croplands should also be managed to reduce pest numbers, as nuisance wildlife may reinvade orchards from these habitats.

Wildlife population reductions may be necessary to reduce damage to tolerable levels. When trapping, care and experience are necessary to reduce captures of non-target species. Live-traps should be substituted for body-gripping traps in areas where pets or endangered wildlife may inadvertently be captured. In rural locations, shooting can be used to effectively remove problem animals. When practical, reductions in populations of game species (i.e., deer, rabbits, etc.) should occur during open hunting seasons. Check with your state department of wildlife

management to help reduce deer or wildlife abundance and impacts on agricultural and forested lands.

Wildlife population reduction by lethal methods often fails to provide long-term relief from damage. Where habitat conditions are suitable, and exclusion is not attempted, most pests will repopulate the site soon after lethal control efforts have ceased. Habitat modification and exclusion methods usually require more initial effort and expense, but these techniques may provide longer-term damage prevention, especially when a few pest individuals can inflict substantial losses.

### 9.2 Meadow and Pine Voles

Two species of voles cause damage in New England orchards. Meadow voles are found throughout the region and probably inhabit every sod orchard. Pine voles are a problem in mostly southern New England orchards, especially in southeast Massachusetts, Connecticut, and Rhode Island. Several orchards in these states have both species present, and may experience considerable damage to trees during severe weather, or when other food sources become unavailable.

The contrasting living habits of meadow and pine voles have important implications for their detection and control. Meadow voles live primarily above the ground surface in dense sod or vegetation. Pine voles live primarily below ground and damage the root systems of trees. When feasible, hand placement of baits in tunnels or under roofing shingles, slabs of wood, or similar protected bait stations, is the preferred method for baiting pine voles. The optimum times to apply baits are in the early spring and after the fall harvest.

For orchards with meadow vole problems, an annual post-harvest baiting program using a \*zinc phosphide-treated bait is strongly recommended. Both grain-based and pelletized baits are available from commercial sources (Table 9.1.1). Do not apply baits (particularly grain-based products) to areas with bare ground, including vegetation-free herbicide strips under trees, as this may increase the chance of feeding and mortality of non-target song and game birds. Hand-place rodenticides under bait stations (i.e., shingles) instead of broadcast baiting orchards frequented by wild turkeys. Pelletized baits are preferred over \*zinc phosphide-treated corn. Research indicates corn baits are less effective and more attractive to non-target wildlife. Always follow label directions for rates and observe all precautions. Because there is evidence that bait shyness may occur with repeated use of \*zinc phosphide baits, a single, complete bait coverage of the orchard site during a period of fair weather is desirable. Ideally, this should closely follow a post-harvest mowing.

Because of their underground habits, pine voles are more difficult to control. In orchards with recurring pine vole problems, the placement of toxic baits beneath previously established baiting stations (1 or 2 per tree) is a reliable method. In addition, toxicants can be hand-placed directly in active underground burrows. Some rodenticides may also be hand-broadcast directly beneath the tree's drip-zone, directing the bait toward burrow entrances. Not all formulations are approved for broadcast application, so follow label directions. Chlorophacinone may provide better control for pine voles because of their habit of caching food in underground burrows. (Chlorophacinone may have a special use label in your state – check with your Extension specialist.) As with meadow voles, late fall is the best time for control efforts. Avoid using acute toxicants such as \*zinc phosphide more than once every 6 months, preferably only once per year. However, heavy pine vole infestations, as indicated by numerous burrows and fresh dirt castings at several adjacent trees, may require a second application of bait about 2 weeks after the first.

The most important consideration in the timing of a control program is to achieve the greatest vole reduction just before onset of severe winter conditions. Voles that remain alive in the orchard will survive under the protection of snow cover and can inflict considerable tree damage during winter months. Monitoring orchards for signs of vole activity enables growers to detect vole population increases. Apple activity indices can provide a reliable measure of rodent numbers and the potential for damage.

Young orchards (trees ranging in age from 1-15 years) are most susceptible to pine vole damage. Also, young trees inter-planted in older orchards are extremely vulnerable and must be protected from pine voles. Persistent pine vole populations in older orchards (trees 30-60 years) should be hand-baited to limit potential vole damage in adjacent younger orchard blocks.

Although toxic baits offer reliable control and should be used where voles are abundant, cultural practices can reduce or even eliminate the need for toxic baits. Careful mowing and herbicide treatment will lower rodent numbers because voles require green, growing vegetation for survival and breeding. The meadow vole is especially vulnerable to close mowing of orchard driveways, and rotary mowers are much more effective than sickle-bar types for removing orchard ground cover and thatch.

The use of an herbicide strip beneath the trees and along the tree rows is a second cultural practice which can effectively eliminate meadow voles. Although close-mowing coupled with herbicide treatments can provide outstanding meadow vole control, recent evidence indicates these management practices will reduce but not eliminate pine voles.

Clean cultural practices, including removing dropped apples, winter prunings, and vegetation near the base of trees, all aid in reducing vole population buildups. Wire or nylon guards can be used for protecting younger trees from

voles as well as rabbits, as long as they are both high enough and buried in the ground a couple inches. Still, good ground cover management = good vole management!

**IMPORTANT NOTE:** \*Zinc phosphide is a restricted-use pesticide and may be purchased and used only by certified applicators or used by someone under the supervision of a certified applicator.

### 9.3 Woodchucks

Woodchucks are found in agricultural lands throughout much of eastern North America. Woodchucks may cause damage by digging burrows and building associated dirt mounds, which can damage farm machinery or tree root systems; and by tearing the bark on the trunk of trees during scent-marking activities.

Woodchucks causing damage may be taken in any manner by owners, lessees and members of their immediate families, or authorized employees, occupying or cultivating lands without a license or permit. Consult your state department of wildlife management if you have questions about a specific situation. Landowners have usually relied on lethal methods to reduce woodchuck damage. However, lethal controls are marginally successful for controlling woodchuck populations, as animals invade orchards from surrounding areas and reoccupy burrow systems.

Shooting and trapping can be used to remove problem woodchucks from fields. Shooting may be illegal or unsafe under some circumstances. Where legal, woodchucks can be captured using #2 leghold traps, #160 or #220 body-gripping traps, or live traps baited with apples and set near burrow entrances. Only live traps should be used where pets or livestock might be inadvertently captured. Woodchucks captured live cannot be legally transported off your property and should be humanely euthanized.

Electric fencing can be effective for reducing wood chuck damage. Electric, high-tensile deer fences may be modified to exclude woodchucks by adding additional wires at 5- to 6-inch intervals up to 18 inches high.

### 9.4 Beavers

Beavers will occasionally chew bark on fruit trees, and most damage often occurs within 300 feet of a permanent water source, such as a stream or pond. Removal of a problem beaver or destruction of a dam or lodge usually requires a permit issued by the appropriate state or local authority. Contact your state wildlife management agency to get more information about resolving beaver conflicts -- shooting or trapping beavers causing damage to agricultural crops may be authorized.

Removal of a problem beaver or family group may reduce tree damage for several years. However if damage persists, other management options may be needed to reduce

economic losses. Beavers seldom stray far from water, and installing a 2-strand electric fence between the pond or stream and the orchard may eliminate beaver access and damage. Also, putting metal vole guards or cages around the base of each tree will protect them from rodent chewing including voles, rabbits, and beavers.

There are no EPA-registered toxicants or repellents for managing beaver damage. Mixing sand with latex paint, then coating the bottom of tree trunks, has shown some

effectiveness in reducing rodent chewing. Growers will need to integrate exclusion techniques along with occasional beaver removal to reduce tree damage in orchards.

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**Table 9.1.1. Common and product names of commercial rodenticides, fumigants, and repellents used in orchards.**

Common Name	Product Name	EPA Reg. No.	Use
*Zinc phosphide	Bonide Orchard Mouse Bait	4-152	Rodenticide
*Zinc phosphide	PROZAP® Zinc Phosphide Pellets	61282-49	Rodenticide
*chlorophacinone	rozol® VOLE BAIT (check state registration status)	7173-242	Voles
13.8% Ammonium Soap	Hinder [1]	5481-508	Repellent
37% Putrescent Egg Solids	Deeraway Big Game Repellent Liquid Spray Kit	50932-6-74794	Repellent
20% Thiram	Nott Chew-Not	358-105	Repellent
2.5% Capsaicin	Hot Sauce Animal Repellent	72-574	Repellent

\* Restricted-use pesticide; may be purchased and used only by certified applicators or used by someone under the supervision of a certified applicator.

[1] Application to apples under hot, humid conditions may result in fruit-finish (spray-burn ring) problems.