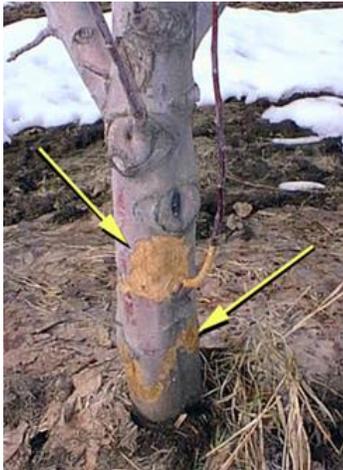




PREVENTING RODENT DAMAGE IN HORTICULTURE CROPS

The results of a 2012 survey on wildlife damage being experienced by growers identified damage caused by rodents (mice, voles and rabbits) as sixth on our overall list of horticulture crop predators.¹ However for certain segments, such as tree nurseries, they were the top rated pest.

The meadow vole is the most common “mouse” in orchards but in southwestern Ontario the pine vole has also caused damage. Voles are active day and night all year round as they do not hibernate. Their home range is usually ¼ acre or less but varies with the season, population density, habitat, food supply, etc. The literature notes that large population fluctuations are characteristic of voles. For example, a study in Ontario cited a range of 32 to 162 voles per acre in the study site over the course of just one year while a similar Illinois study documented two to six voles per acre also over a year. Population levels tend to peak every two to five years however these cycles are not predictable.



Vole and mouse damage to trees can be distinguished from girdling caused by other animals as their gnaw marks are not uniform. They occur at various angles and in irregular patches. Marks are about 1/8 inch wide, 3/8 inch long, and 1/16 inch or more deep.

Photo credit: Washington State University Extension http://county.wsu.edu/chelan-douglas/agriculture/treefruit/Pages/Mouse_Damage.aspx

Rabbit gnaw marks are larger and not distinct. Rabbits will also neatly clip branches with clean diagonal cuts. Examine girdling damage and accompanying signs (feces, tracks, and burrow

¹ The top six ranked predators, in descending order of damage, were: deer, wild birds (songbirds), Wild Turkeys, Canada Geese, raccoons, and mice/voles/rabbits.

systems) to identify which animal is causing the damage.

Rabbit feeding. Small twigs are cleanly cut off with a sharp edge at a 45° angle. Photo credit: M. Grabowski, University of Minnesota, <http://www.extension.umn.edu>



Both cottontail and jack rabbits can cause damage to fruit trees as other food sources become scarce in winter months. Although rabbits prefer tender terminal growth and fruit buds, some will resort to girdling the bark off the trunk. As growers know, damage to terminal shoots can result in malformation of tree growth and loss of bark may result in tree death, loss of productivity, and/or provide an entryway for insects and disease.



Bark has been completely removed from the main trunk by rabbit feeding. Regular scraping the size of a spoon tip can be seen in the wood. Photo credit: M. Grabowski, University of Minnesota, <http://www.extension.umn.edu>

Site Characteristics and Management

There are some management practices which can reduce the likelihood and severity of vole damage including eliminating weeds, ground cover and crop residue. Mulch should be cleared three feet or more from the base of trees. Soil tillage is also effective in reducing vole damage as it removes cover, destroys existing runway-burrow systems and kills some voles outright. Because of tillage, annual crops tend to have lower vole population levels than perennial crops.



Left: Rodent damage to an apple tree. Mouse feeding occurred while the trunk was covered with snow. Right: A row of trees killed by pine vole. Notice grass was mowed between the rows but not between the trees within the row. Source: *Illinois Fruit and Vegetable News, University of Illinois, Urbana-Champaign, Vol. 18, No. 14, October 2, 2012.*

Rabbits prefer dense vegetation near feeding areas for protection from predators. Mowing, cutting brush, removing brush piles or overgrown areas, and vegetation control along ditch banks or fence rows will eliminate prime rabbit habitat.

Feeding rabbits during the winter to provide them with an alternate food source to trees and shrubs is an option but could just as easily intensify the problem by attracting a greater number of rabbits or increasing the survival of those present.

Visual and Auditory Devices

Inflatable owls and snakes, eyespot balloons, and other visual scaring tools are promoted for use with rabbits however they are not usually effective at deterring them from feeding for long. Frightening devices are not effective in reducing vole damage.

Chemical Deterrents

Repellents utilizing thiram or capsaicin as active ingredients are registered for meadow voles. These products may provide short-term protection but studies have not been conducted which document their efficacy.

There are several chemical repellents designed to discourage rabbit browsing. Those that contain thiram, when properly used, appear to offer reasonable tree protection; some preparations mix white latex paint with the thiram. It is important not to dilute the product and to treat the tree as high as rabbits can reach when standing on deep snow. Most commercial products will not hurt buds but

they are not designed to be used on plants or plant parts that are for human consumption.

Generally, rabbit repellents are contact or taste repellents that render the treated plant parts distasteful. Mothballs are an example of an odor repellent that deters rabbits by creating a noxious odor around the plants to be protected. Taste repellents are usually more effective than odor repellents. The degree of efficacy, however, is highly variable depending on the behavior and number of rabbits, and alternative food available.

Exclusion

A number of commercial tree guards are available which will protect seedlings and young trees against both rabbit and vole damage. Two of the most common are spiral plastic and galvanized wire mesh.



Source: Ontario Agricultural Photo Library

For voles, the bottom of the guard should be buried six inches in the soil to keep voles from burrowing under the cylinder. If using a mesh material, the mesh should be ¼ inch or less. To increase effectiveness, place a mound of fine crushed stone or sharp cinders around the tree. Tree guards should be checked each fall to see that they are tight but are not interfering with root development.

To protect against rabbits, the tree guard should extend up the trunk as high as rabbits can reach; 18 to 20 inches should be sufficient. If you are making your own guards, do not use dark coloured materials or tar paper as these materials can increase the temperature of the bark on sunny days in winter and subsequent low temperatures at night can cause injury to the bark. Also, they provide a place for trunk damaging insects to live. Heavy aluminum foil or thin metal sheets should also be



avoided. Unventilated guards of this type have the potential to damage trees by allowing the trunk to heat.

Removal

A wide variety of predators feed on voles which are relatively easy to catch as they are active during the day and night year round. However, despite their vulnerability and availability, voles are not usually effectively controlled by predators because they have a high reproductive rate.

Encouraging the rabbit's natural enemies (hawks, owls, fox) may reduce their population and resulting tree damage. Shooting rabbits is also a means of reducing their numbers but it must be done regularly throughout the year because other rabbits soon move into the area. This method by itself cannot be depended upon to provide adequate control.

Poisoning of rabbits is not allowed however this may be an option for voles. At harvest time, check for signs, e.g. tunnels, droppings, fresh grass clippings in runways, and chewed fruit. Baits are most effective if dropped fruit is picked up and removed from the orchard. Before the grass falls over and the ground is covered with snow, broadcast bait over the floor of the orchard. Baits are best applied on bright days with no rain expected for several days. Several commercial formulations of bait are available for orchard use. Consult the label before application and obey all safety instructions. The use of bait stations provides a longer period of mice control than the broadcast treatment.

S. Fitzgerald for Ontario Fruit and Vegetable Growers Association, May 2013.

Additional Resources:

Ministry of Natural Resources

Look under the Wildlife Management, Living with Wildlife, and related links pages www.mnr.gov.on.ca

Ontario Fur Managers Federation

They can provide contacts to professional trappers. 705-254-3338 furmanagers@gmail.com
www.furmanagers.com

Ontario Federation of Anglers and Hunters can advise on hunting regulations or how to locate a hunter in your area. 705-748-6324, ofah@ofah.org
www.ofah.org