

## Non chemical control of voles

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In just six months a female vole (Microtus spp.) has the biological potential to have over 40,000 grandchildren. Luckily the average vole lives less than a month and natural mortality factors keep them from reaching their full reproductive potential.

But every spring, homeowners and farmers receive a surprise when snowmelt reveals little trails scattered along grassy areas. The voles have been at work all winter under the snow; removing green vegetation down to the soil and creating a maze of runways and bare patches. Vole control is a never ending task and a never ending frustration for many farmers. During summer, voles will often eat plant leaves, stems and pods in gardens.

Through persistence and creativity it is possible to offset vole damage. Even the frustrating failures will be interspersed with satisfaction resulting from the large natural population fluctuations that are characteristic every two to five years.

Voles are found throughout the United States. There are over 20 vole species and all of them cause widespread and significant economic damage to gardeners and farmers. Voles occupy a wide variety of habitat but they are normally found near areas with heavy ground cover of grass or other dense vegetation. Generally the damage that occurs in gardens and lawns is adjacent to natural areas where long-term vole habitat exists.

Voles eat a wide variety of plants but most frequently they eat grasses and forbs. In the summer and fall they store seeds, tubers, bulbs and rhizomes. Occasional foods include small animals such as snails, insects and animal remains.

Voles are active day and night throughout the year. They do not hibernate. Their home range is usually a quarter acre or less but varies with the season, population density, habitat and food

supplies. Voles construct many tunnels and surface runways with several burrow entrances. One burrow system may contain several adults and their young.

Voles breed throughout the year but the most commonly in the spring and summer. They generally have one to five litters per year and the litter size ranges from one to eleven but is usually three to six. The gestation period is 21 days and females usually mature in 35 to 40 days. Under ideal conditions females may breed as early as 2 weeks of age. Life span is short ranging from two to sixteen months once adulthood is reached.

Population densities of voles are variable. Research has shown populations range from about two to more than 50 per acre in normal grasslands. Populations in alfalfa are often over 100 voles per acre. The highest reported density was during a 1957 population irruption in Oregon where voles numbered 4000 per acre.

Voles are prey for many predators from coyotes and snakes to hawks, owls and weasels. Encouraging predators often is considered as a method of vole control. Many predators feed on voles because they are relatively easy to catch, they are active day and night, and they are abundant. But because of a high reproductive rate of voles, populations are unlikely to be controlled by predators.

Voles are classified as nongame mammals that can be controlled when causing damage. Always contact your state wildlife agency for details regarding local codes and regulations.

Voles may cause damage as they girdle trees and seedlings and damage roots. Tiny marks from vole incisors can be seen which help differentiate vole damage from other causes of bark removal or root damage. On lawns, most damage results from the vole's extensive runway and tunnel system. Turfgrass is damaged when the well-traveled runways and adjacent areas are clipped close to the ground. Feces and small pieces of vegetation are usually evident in the runways. Excessive urine and feces can sometimes make re-establishment of grasses a challenge.



When controlling vole damage, success will be higher if a variety of methods are used to address the problems.

### **Habitat Modification**

Employ cultural methods that eliminate weeds, grass, litter and loose mulch which provide voles cover and sources of food. Mowing grass short around trees will reduce the ease of vole travel.

Clearing a 10-foot area around gardens by burning and/or tilling will discourage voles from crossing the open area. Soil tillage is effective in reducing vole damage because it removes cover and destroys vole tunnels.



The shorter the grass, the more difficult it will be for voles to move from one area to another during winter. Cutting grass as short as possible in a 10 foot swath next to native grass areas will make it difficult for voles to move into other areas under the snow. Voles travel very well under snow if they can move freely through vegetation or loose material between the soil and snow. Eliminating this layer is the key to preventing vole movements during the winter.

### **Exclusion**

Exclusion is often the best method to protect seedlings and young trees. Hardware cloth cylinders and some commercially made plastic cylinders are very effective when used properly. The mesh should be  $\frac{1}{4}$  inch or smaller and must be buried 6 inches to keep the voles from burrowing under the cylinders. Be sure the cylinders extend above the expected snow level.

### **Repellants and Frightening Devices**

Repellents, with capsaicin as the active ingredient, are registered for meadow voles and may provide some short term protection. Because repellents must be reapplied often, the logistics of using them to prevent vole damage is usually not practical.

Frightening devices are not effective in reducing vole damage. A large variety of frightening devices claim to keep rodents away. Lights, sounds and numerous ultrasonic devices have been tested and none have proven effective in controlled experiments.

### **Trapping**

Trapping is not usually effective in controlling large vole populations because the time, labor and number of traps used can be excessive. However, for small populations, snap traps (mouse traps) baited with nutty peanut butter will work. Place the traps in small boxes with 1 inch holes cut on each side. Use 3-4 traps in each box to better attract other voles after the first ones are caught. Check traps every 48 hours.

Spring-loaded, multiple-catch traps may be useful in some situations. Freezing weather and rain may sometimes reduce their effectiveness.

Placing 2- inch PVC pipe at ground level under the snow will provide a travel corridor for voles. These pipes can provide entry to multiple-catch traps or boxes where snap traps are placed. Cutting 1-inch holes in the PVC every 2 feet will further encourage the voles to enter the pipes.

### **Other Methods.**

Packing snow can obstruct vole movements between native grass areas and lawns or gardens. It has been found that voles are reluctant to go over the top of packed snow areas they cannot burrow through. To maintain these packed areas some farmers have used snowmobiles or developed cross country ski trails along edges.

Some people think that cats can provide good control of voles. While cats to kill voles, they will not kill a sufficient number to provide adequate control. Also, they will kill a variety of other species that would be beneficial to your garden and landscape.

### **Acknowledgments**

Much of the information presented here was adapted from S.E. Hygnstrom (1994) in Prevention and Control of Wildlife Damage, University of Nebraska, Lincoln, NE.

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