

Voles

Wildlife management series for Midwestern farmers



Common vole.

Penn State University Extension publication "Voles" 2007

Common and Latin name: Voles (*Microtus* sp.)

Commonly impacted crops: Voles may cause extensive damage to orchards, small fruit, ornamental and tree plantings when they girdle seedlings and mature trees and feed on roots.

Relevant regulatory agency: State Department of Natural Resources.

Species overview

Physical description of animal: Voles are compact rodents 3-7 inches long with stocky bodies, short legs and short tails. Their eyes are small and their ears partially hidden. They are typically brown or gray, though many color variations exist. Three species of voles exist in the Midwest and differ slightly in their size and preferred habitat. For more information on how to identify rodents, refer to the University of Nebraska Cooperative Extension publication "[Prevention and Control of Wildlife Damage.](#)"

Habitat and range description: Voles occupy a wide variety of habitats including pastures, roadsides, fields, wetlands and upland sites. They prefer areas with heavy ground cover of grasses or grass-like plants, litter, mulch or snow. Orchards and tree plantations can also provide good vole habitat, if sufficient ground cover is present.

Behavior including food habits: Voles are active day and night and do not hibernate. Based on the particular vole species, they construct either many surface runways or shallow tunnels in dense grass with numerous burrow entrances. In winter, voles are active in runways under the snow.

Voles eat a wide variety of plants, most frequently grasses and forbs. In late summer and fall, they store seeds, tubers, bulbs and rhizomes. Voles will eat bark of woody plants at times, primarily in fall and winter, and will also eat annual crops and vegetables, especially when their populations are high.

Voles are extremely prolific, but short-lived with high rates of mortality caused by predators including snakes, hawks, owls, fox and coyotes. Their peak breeding activity occurs between March and October, but when winters are mild, voles may breed all year long. A female vole could potentially produce over 70 young in a year. Scientists have found vole populations expand and contract on a four-year boom-bust cycle.

Identification of damage: Extensive vole damage may occur in orchards, small fruit, Christmas trees or other tree plantations, particularly during peak populations or heavy snow years. However, girdling and gnaw marks alone do not necessarily indicate voles are present since other animals, like rabbits, may cause similar damage.

Vole girdling can be differentiated from girdling by other animals based on non-uniform gnaw marks occurring 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.

Rabbit gnaw marks are larger and not distinct. Rabbits also neatly clip branches with angled clean cuts. Examine girdling damage and accompanying signs like feces, tracks and burrow systems to identify the animal causing damage.

The most easily identifiable sign of voles is an extensive surface runway system with numerous burrow openings. Runways are 1 to 2 inches in width.



Network of vole runways.

Vegetation near well-traveled runways may be clipped close to the ground. Feces and small pieces of vegetation are often found in vole runways.

Management

Legal status: Voles are classified as nongame mammals and can be controlled without a permit when causing damage. Contact your state wildlife agency for details regarding applicable codes and regulations.

Strategies: No single management method to prevent vole damage works all the time or in all settings. Generally, multiple management methods should be combined so that one method enhances the effects of another.

Monitoring: Vole damage can be overlooked due to the inconspicuous nature of voles. Since vole populations can increase rapidly, damage can appear to come on suddenly. Damage from one species of vole—the pine vole—is harder to detect because it burrows just below the ground surface and girdling damage to trees can go unnoticed. By the time

orchardists note unhealthy trees, the damage is often already extensive. Monitoring is critical to minimize vole damage.

Exclusion: Hardware cloth or plastic cylinders can effectively exclude voles from seedlings and young trees. The mesh should be 1/4 inch or less in size. Bury the wire 6 inches to keep voles from burrowing under the cylinder. It is probably not cost-effective to attempt fencing large areas to exclude voles.

Alternative methods: Modifying environmental factors to moderate vole populations can be useful. Burning, mowing, using herbicides, cultivation or selecting low growing plants to reduce vegetative cover can help make a site less attractive to voles.

Controlling ground cover also exposes voles to raptors, coyotes and other predators. Removing plant cover in strips at least 15 feet wide surrounding an agricultural area may help slow new voles from moving into a site. Consider encouraging raptor predators through perches or nest boxes. Ideally, adjacent landowners can work together to manage large areas of land to prevent high vole populations from becoming established.

Repellents: Various repellents made with thiram, capsaicin, castor oil and other active ingredients are available for vole control in ornamental plants. However, these products are not labeled for use on food crops. Repellents are relatively expensive and provide only short-term protection. Wet weather can quickly degrade repellents, creating a need for frequent reapplication. When vole foods are in short supply, such as in winter, repellents' effectiveness usually decreases.

Toxicants: Using rodenticides is an important component of an integrated vole control program, but should not be relied upon as a stand-alone control. Voles have a relatively short lifespan and reproduce quickly, making lethal control strategies effective for only a limited time and further enforcing the need for an integrated approach.



Trees girdled by voles.



Vole injury on larger roots of an orchard tree.

There are a limited number of rodenticides labeled for use in cropping systems and availability varies by state. Carefully review labels to ensure the intended site is listed before application. Use all rodenticides according to the label. In general, rodenticide application to bearing crops is only permitted during the dormant season. Application to non-food crops is generally less restricted. Many products recommend using bait stations to help protect non-target organisms. Read and follow all label directions to reduce risk of pesticide exposure to yourself, others, non-target organisms and the environment.

Trapping: Trapping is not effective in controlling large vole populations because labor costs become prohibitive. However, mouse snap traps can be used to control a small population. Place the trap perpendicular to the runway with the trigger end in the runway. A peanut butter-oatmeal mixture or apple slices make good baits. Covering traps and the nearby runway with a tunnel of opaque material may improve effectiveness. Many vole species are easiest to trap in fall and late winter.

Considerations

As in most situations with vertebrate pests, a combination of methods may be more effective than relying on any one method for controlling vole damage. Most problems with voles in urban and backyard areas probably involve small populations that can be controlled with habitat modifications, exclusion or trapping. Non-urban damage situations may involve larger populations of voles spread over greater areas, and can be resolved using habitat modification and toxic baits.

Voles don't always cause significant damage to property. Populations of voles, however, can increase quickly and be cause for concern. Generally, a direct relationship exists between populations of voles and the expected overall level of damage.

Before undertaking control, consider the extent of the problem in relation to control cost. For example, a few voles could damage a highly valued tree or flower bed and warrant control. At other times, they may go virtually unnoticed, making control unnecessary. Given their incredible reproductive rate, new infestations can seem to appear overnight. Usually, it is more cost-effective to respond quickly to signs of damage than to wait until damage becomes severe. The complete elimination of rodents from agricultural systems is neither necessary nor feasible.

Acknowledgments

Falker, Shannon T., Brittingham, Margaret C and Williams, Lisa. "Voles." PennState Extension. 2007. <https://extension.psu.edu/voles>.

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PennState Extension. "Orchard Wildlife - Integrated Management of Voles in Orchards." 2017. <https://extension.psu.edu/orchard-wildlife-integrated-management-of-voles-in-orchards>.

Vantassel, S.M., S.E. Hygnstrom and D.M. Ferraro. "Controlling Vole Damage." NebGuide, University of Nebraska. 2011. <http://extensionpublications.unl.edu/assets/html/g887/build/g887.htm>.

Additional resources

Visit our Wildlife Management website for additional fact sheets on managing other wildlife and for more resources: bit.ly/wildlife-mge

U.S. Fish and Wildlife Service <https://www.fws.gov/offices/>

Your state's Department of Natural Resources or similar agency

Directory of Midwest Wildlife Management Agencies

Information from February 2019.

Illinois

Department of Natural Resources: (618) 435-8138
www.dnr.illinois.gov
USDA APHIS Wildlife Services: (217) 241-6700

Indiana

Department of Natural Resources: (317) 232-4102
www.in.gov/dnr
USDA APHIS Wildlife Services: (765) 494-6229

Iowa

Department of Natural Resources: (515) 725-8200
www.iowadnr.gov
USDA APHIS Wildlife Services: (573) 449-3033

Kansas

Department of Wildlife, Parks and Tourism:
(620) 672-5911 www.ksoutdoors.com
USDA APHIS Wildlife Services: (785) 537-6855

Michigan

Department of Natural Resources: (517) 284-6057
www.michigan.gov/dnr
USDA APHIS Wildlife Services: (517) 336-1928

Minnesota

Department of Natural Resources: (651) 296-6157
www.dnr.state.mn.us
USDA APHIS Wildlife Services: (651) 224-6027

Missouri

Department of Natural Resources: (800) 361-4827
www.dnr.mo.gov
USDA APHIS Wildlife Services: (573) 449-3033

Nebraska

Department of Natural Resources: (402) 471-2363
www.dnr.nebraska.gov
USDA APHIS Wildlife Services: (402) 434-2340

North Dakota

Game and Fish Department: (701) 328-6300
www.gf.nd.gov
USDA APHIS Wildlife Services: (701) 355-3300

Ohio

Department of Natural Resources: (800) 945-3543
www.ohiodnr.gov
USDA APHIS Wildlife Services: (614) 993-3444

South Dakota

Game Fish and Parks: (605) 223-7660 www.gfp.sd.gov
USDA APHIS Wildlife Services: (701) 355-3300

Wisconsin

Department of Natural Resources: (888) 936-7463
www.dnr.wi.gov
USDA APHIS Wildlife Services: (608) 837-2727



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