



Voles

[*Microtus* spp.]

Ryan Davis, Arthropod Diagnostician

Quick Facts

- Voles do not hibernate and can cause damage at any time of the year.
- Vole populations can vary widely each year, depending on environmental factors such as food availability and climate.
- Monitor for voles by searching for signs of activity, including gnaw marks on trees, and runways, grass clippings, feces and burrows in turf or groundcover.
- Control includes trapping, habitat modification, and baiting.



Fig. 1. Adult meadow vole¹.

nose. They are typically brown to gray mixed with black hairs. Younger voles may be darker with nearly black feet.

Voles are a frequent pest of turf, ornamental plantings, orchards, hay and pasture in Utah. They are active throughout the year and damage can occur at any time. Winter can be a particularly hard time for voles to locate preferred food sources, and instead will feed on the lower bark of woody plants, girdling them beneath the snow line.

Damage during the rest of the year includes burrowing and feeding in turf, and root damage to vegetables, tubers, grass pasture, and alfalfa hay fields, where production can be reduced by 10 to 50% by vole activity. Voles can also play minor roles in disease cycles and occasionally enter homes. They are listed as non-game animals in Utah and are protected, though controls can be implemented when voles are causing damage.

There are five vole species in Utah, but the meadow vole (*Microtus pennsylvanicus*) is the most common (Fig. 1). The biology and control methods for all voles are similar, and the focus of this fact sheet is the meadow vole.

IDENTIFICATION

Voles range in size from 4 to 7 inches with tails that span $\frac{3}{4}$ inch to 4 inches. Their average weight is 3 to 4.5 oz. Voles are stocky rodents with short legs, small ears and a blunt

BIOLOGY

Voles are active year-round, and do not hibernate. Their populations vary from year to year, depending on environmental factors. In epidemic years, they can number over 400 per acre. Voles are prolific breeders, and produce an average of 3 to 5 litters per year in outdoor locations. If food is plentiful, the number of yearly litters can soar to 17. There can be multiple voles per burrow and runway system.

Litter size ranges from 1 to 11 individuals, and can be affected by the quality and quantity of food and the environment. Peak breeding occurs in early spring with another spike in the fall. Voles live from 2 to 18 months, with predation being the top killer: up to 88% in some cases.

ACTIVITY AND DAMAGE

Voles are difficult to observe during the day, as they tend to be most active in the morning, evening, and night. Signs of activity include gnaw marks at the base of trees or on roots, measuring about 1/8-inch wide and 3/8-inch long. The presence of 2-inch wide runways in turfgrass (Fig. 2), and burrow openings about 1.5 inches wide in

fields or cultivated areas (Fig. 3) are all indicators of voles. Runways often include multiple burrows and can be littered with vegetative clippings, feces, and soil.

Voiles love low cover. Groundcovers and thick litter provide preferred nesting habitat (Fig. 3). Often, runways can be seen leading from turf into areas with low-growing vegetation where the burrow or nest is located. Voiles prefer to stay close to home if food is readily available, but territories can range from 0.5 to 1.5 acres.



Fig. 3. Meadow vole nest in groundcover³.

MANAGEMENT

Control for Homeowners

Monitoring. Monitor for signs of activity such as runways, burrows, feces, plant clippings, gnaw marks, damage and voiles (Figs. 2 & 4). Locating areas of high activity is critical for implementing control strategies. These areas include runways that are wide and worn, active burrows, and other areas where ample feces or signs of activity or voiles can be seen.



Fig. 4. Vole feeding injury to tree bark⁴.

Traps. Standard mouse snap traps with expanded triggers (the kind used for mice) can be used to kill voiles. Unlike mice, traps for voiles do not need to be baited, but some use a peanut butter-oat mix or apples to help attract voiles. Expanded-trigger snap traps can be placed directly in vole runways near burrows or areas of high activity. Place traps at right angles, flush with the bottom of the runway to catch voiles as they accidentally run over the triggers. Traps should be attached to the ground with a wire or chain, to prevent predators from removing them. Traps can also be covered to protect children, pets and animals.

Though voiles do not often enter homes, they can occasionally find their way inside. Indoors, traps should be placed in sets, 1 inch apart, along baseboards with expanded triggers facing the wall. Check traps and remove dead voiles daily.

Live trapping options include multiple-catch traps in runways and Sherman live traps (10"x3"x3") next to walls. Due to possible disease transmission, always handle rodents with rubber gloves and bury dead voiles.

Exclusion. Excluding voiles from gnawing on shrubs or trees can be accomplished by using ¼-inch hardware cloth around the stem. The mesh should be buried to a depth of 6 inches and extend 6 inches out of the ground, or to the possible snow line. Hardware cloth can also be used on a small scale to exclude voiles from garden beds or other areas. To keep voiles from accidentally invading the home, install properly fitted door sweeps, door seals, and plug any access points into the home with metal flashing, hardware cloth, or a product like Xcluder.

Habitat modification. Modify vole habitat by removing low groundcover or low shelter. Prune trees, shrubs and branches away from the ground, mow the lawn short, remove weeds or tall grasses in turf and around trees, remove mulch from around root collars, and remove other objects under which voiles may nest or harbor.

Baits. Rodenticides may be needed in conjunction with non-chemical techniques to bring vole populations under control, especially if larger areas are affected. There are a few general-use anticoagulant vole baits registered in Utah that contain diphacinone: Ramik Green, Ramik Green Mini Bait Packs, and Ramik Mini Bars. The bait should be placed in areas of high rodent activity and burrows. *Tamper-resistant bait stations must be used for any above-ground application or any application to which non-target animals or children may have access.* Ramik Green cannot be used more than 100 feet away from a home or structure. Always follow the label when applying any pesticide.

Anticoagulant baits for the consumer market have recently been restricted, excluding the sale of pelletized baits to homeowners. Diphacinone is a slower-acting active ingredient that allows for safer homeowner use, and time to administer an antidote (vitamin K) if a pet should accidentally consume the anticoagulant bait. To protect pets and other animals from bait poisoning, deliver baits directly into burrows, or in tamper-resistant bait stations. Always keep baits fresh and dry. Visit [this web page](#) for more information on the consumer rodenticide regulations.

Control for Commercial or Agricultural Settings

Traps and habitat modification. Using snap traps for large-scale vole control is impractical. Eliminating or reducing protective habitat is critical to vole management. Vegetative cover can be managed by burning ditch banks, pits, and fence lines. Weed-free zones or cultivated areas may be established around crop areas. For alfalfa, grazing or mowing in the late fall when active plant growth is not taking place can reduce vole habitat and food sources, stressing winter vole populations. In an orchard, individual trees may be protected using hardware cloth.

Zinc Phosphide. Zinc phosphide products used for vole control are restricted-use, and can only be used by licensed pesticide applicators. It can be broadcast or placed directly into burrows or bait stations (Fig. 5). Application sites and methods may vary according to the product. Consult the label prior to making an application to make sure the correct product is selected for your site and situation. Examples include Prozap Zinc Phosphide Oat Bait, ZP Ag Oats, and Wilco Zinc Ag Bait.

Anticoagulant baits. Anticoagulant baits may also be used on a large scale. Anticoagulants are commonly hand-applied as spot treatments or broadcast applied. Read and follow these nuanced product labels prior to application. Most anticoagulants registered for use on voles in Utah are restricted-use products and include diphacinone (Ramik Brown: not for use in lawns) and chlorophacinone (Borderline; Rozol Vole Bait: neither are for use in lawns).

When using any bait product, carefully read the label. Be aware of use restrictions, personal protection equipment, potential environmental hazards, risks to children, pets and endangered species, application sites (home lawns

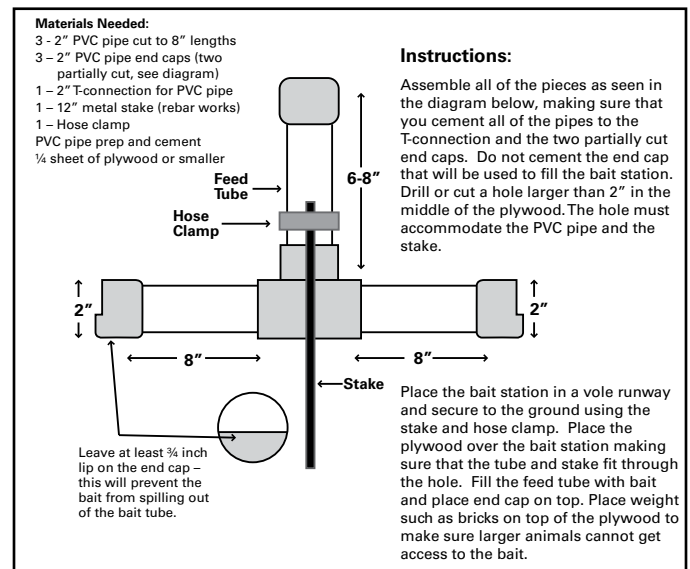


Fig. 5. Bait station construction⁵.

and ornamentals vs. agricultural use) and methods (i.e. hand, bait stations, broadcast, aerial, trailbuilders, etc.), distance from or proximity of residential structures or agricultural buildings, and other use restrictions.

Natural predators. Vole populations can be reduced by promoting raptors and owls with nest boxes and perches, as described in [this fact sheet](#). Capsaicin-based feeding deterrents or repellents can be effective, but have short-lived activity in protecting plants.

REFERENCES

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PHOTO CREDITS

¹ University of California Statewide IPM Project

² Ryan Davis, Utah State University

³ Kiera's Forest, Natureguelphtracking.wordpress.com

⁴ USDA Forest Service, Bugwood.org

⁵ Sherman Takatori, University of Idaho

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