

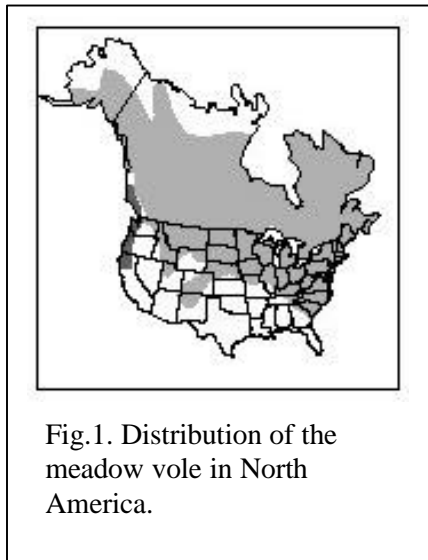
# RODENT INJURY IN AND AROUND CRANBERRY BEDS

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Cranberry growers are reporting increasing incidence of rodent trails through their beds and large emigration from beds when floods go on. Rodent trails are, just as the name implies, trails frequented by rodents such that they are visible in the beds. In some cases it is clear that rodents have gnawed off uprights. The damage resembles cranberry girdler injury in some cases.

It is not clear if rodents are causing economic loss or are just causing cosmetic damage to beds. Cranberries have an amazing ability to compensate for minor damage. Further research would be required to establish economic injury thresholds for vole populations in cranberry beds.

The likely culprit is the Meadow Vole (*Microtus pennsylvanicus*). Meadow voles are widely distributed throughout North America (Fig. 1). Its total length is 5 ½ to 7 ½ inches and its fur is gray to yellow-brown, obscured by black tipped hairs. Its underparts are gray. The preferred habitat is wet meadows and grasslands. This sounds an awful lot like cranberry production areas. Meadow voles eat a wide variety of foods, mostly grasses and herbaceous plants. In the late summer they store seeds, tubers, and rhizomes. They will eat crops when populations are high and occasionally they will eat insects, snails and animal remains.



Voles are active both day and night, year round. They do not hibernate. They usually range over an area of about ¼ acre.

Large population fluctuations are normal with populations peaking about every 2-5 years, but the cycles are not predictable. High populations occur when adequate food, hospitable climate, good genetics, low predation and low physiological stress are present. Population densities are highly variable with studies placing populations of meadow voles from 32 to 160 per acre in an Ontario study to 2-6 per acre in an Illinois study.

Many voles are excellent swimmers and some are good climbers. Voles are prey for many predators including coyotes, snakes, hawks, owls and weasels. Predators do not normally control vole populations. Voles are non-game mammals and can be controlled when causing damage.

## Managing Vole Populations

**Exclusion.** Exclusion works well for small areas such as hardware cloth cylinders around individual trees. Obviously, in a cranberry marsh exclusion is not a viable option.

**Frightening.** Frightening agents such as sounds are not effective in reducing vole damage.

**Repellants.** Some repellants such as capsaicin (the "hot" in chili peppers) can provide short term protection but will not provide long term control.

**Cultural methods and habitat reduction.** This is the primary means of managing vole populations. In order to thrive voles need food, shelter, and protection from predators. Removing any one of these will serve to reduce populations.

Reducing the food supply in a cranberry marsh will be difficult. However, mowing dikes and ditch banks and keeping herbaceous weeds out of the beds will reduce the immediate availability of food. Berries left on dike edges or bed floors after harvest may be food for voles, but it would not be practical to collect or destroy these.

Mowing dikes and ditch banks will also destroy vole habitat. However, this may also serve to drive voles into the beds. Certainly cranberry beds offer ideal habitat for voles. The cranberry canopy is sufficiently tall and dense to provide protection from predators, yet the canopy is sufficiently open to allow runways or trails. Small burrows in dikes or beds can be well hidden and would offer excellent protection from the elements. Sprinkler pipe placed on the dikes before harvest would provide excellent rodent habitat through the fall and winter. Further, after the winter flood has been drained when cracks may form along bed edges rodents have access to beds and under the ice would be excellent habitat with food, protection from the elements and predators. Eliminating habitat is likely not a complete answer for vole management in cranberries.

Again, mowing dikes and ditch banks will remove protection from predators. Avian predators can be encouraged to live or hunt in the area by providing stands or nest boxes. A tall pole with a flat board on top is an excellent hawk stand where they can survey the area looking for movement. However, this action will probably not increase predator populations since the same factors drive predator and rodent populations with adequate food supply at the top of the list.

**Toxicants.** Baiting for rodents can be an effective means of reducing high populations. However, remember that compounds that are toxic to rodents are also toxic to people and to other mammals and perhaps birds. **To my knowledge none of these materials are labeled for placement within cranberry beds, so all baiting would need to be done outside of the planted beds.** Handle and place baits with care. Rodenticides can be grouped into three categories: anticoagulants, zinc phosphide and calcium remobilizers.

Anticoagulants are materials like Warfarin and diphacinone. These work by preventing the blood from clotting so that if rodents are injured or as they squeeze through tight spots they bleed internally. These materials are relatively slow acting and may take several feedings to be effective. Because of this bait shyness may develop where after initial feedings rodents will avoid the bait. Anticoagulants may be used indoors or outdoors.

Zinc phosphide is an acute poison. It may be effective with a single feeding. When zinc phosphide contacts stomach acids phosphine gas is released which kills the rodent in a matter of hours. Zinc phosphide is not stored in muscle tissue so secondary poisoning does not usually occur. Zinc phosphide may be used indoors or outdoors.

A chemistry that has recently become available is cholecalciferol or vitamin D<sub>3</sub>. This acts by mobilizing calcium from the bones into the blood stream resulting in hypercalcemia, leading to heart failure. This material does not lead to bait shyness and there is no secondary poisoning.

Toxic baits come in a variety of forms from paraffinized bars to pelleted baits to treated meal or cracked grain. The pelleted or paraffinized baits will stand up to weather better. Choose a bait that best suits your situation.

**Bait stations.** It is critical to place poisons so they are readily available and attractive to rodents while not being available to non-target species. Bait stations are one approach to accomplish this. A variety of commercial bait stations are available and are effective. One inexpensive and effective bait station is made of 1½ or 2 inch PVC pipe. Six inch lengths of pipe are inserted into the openings of a "T" and the T is laid on its side along a dike or other suitable spot outside of beds. The bait station should be placed without bait for a week or two before adding the bait to allow rodents to habituate to the station. To add bait, lift up the side arm of the T and pour in the bait and then set it back on its side. This sort of bait station excludes larger mammals and birds and it provides protection for rodents while they feed. Because the station is open on both ends rodents can see that they won't have to "back out" blindly but can exit head first. Slanting a shingle over a rock and placing the bait underneath makes an even more simple bait station.

Don't forget to bait in pump houses, machine sheds and other structures that may offer food and protection for rodents if populations are excessive.

No single approach to rodent management will solve the problem. You'll achieve the best results by taking multiple actions. Given the cyclical nature of rodent populations patience may be the best approach.

*Note: Much of the material for this article was adapted from O'Brien, J.M. 1994. Voles. pp. B-177-182 in Prevention and control of wildlife damage. University of Nebraska, Lincoln.*