

TECHNICAL NOTES

**USDA-Natural Resources Conservation Service
Boise, Idaho**

TN PLANT MATERIALS NO. 34

APRIL 1999

GUIDELINES TO REDUCE RODENT DAMAGE WHILE ESTABLISHING WINDBREAKS

Loren St. John, Team Leader, Aberdeen PMC, Idaho

**File this in the Plant Materials section of the Technical Notes, Section 6 of
the Technical Guide**

GUIDELINES TO REDUCE RODENT DAMAGE WHILE ESTABLISHING WINDBREAKS

Loren St. John, PMC Team Leader

A successful windbreak planting is dependent upon proper design, site preparation, planting, and post-planting care. Many areas can experience large infestations of voles or meadow mice during ideal conditions for population expansion. Control measures should be taken during all phases of windbreak establishment to help reduce potential rodent problems.

Voles or meadow mice (*Microtus* spp.) generally eat grass and forbs but when preferred food sources are scarce, they will girdle trees by eating the bark and cambium layers. When vole populations are large, crowns and roots may also be damaged. Voles are very prolific, producing 4 to 6 litters each year with 4 to 6 offspring per litter. A moderate infestation of 500 voles per acre will damage up to 20,000 pounds of plant material annually. Factors that influence large infestations include availability of protective cover, favorable weather, abundance of food, and high reproductive potential. Factors that influence population decline include scarcity of food, exposure to elements, disease, predation, and the use of rodenticides.

DESIGN PHASE

During the design phase look for indications of vole activity. Runways and holes will be present if voles are active in the area. Sites with a heavy cover of grass, weeds, or shrubs are ideal habitat. If areas adjacent to the proposed windbreak site have heavy cover and appear to have indications of vole activity, three questions need to be answered: 1) is the site appropriate for a windbreak; 2) can rodent control measures be successful; and 3) should windbreak species selection be altered to species that are less attractive to voles?

From experience by PMC staff at Mountain Home Air Force Base, Idaho, species selection was changed after losses from vole damage. Heavy damage occurred on poplar, chokecherry and to a lesser extent, Siberian peashrub. There was little to no damage to Rocky Mountain juniper or Austrian pine.

SITE PREPARATION

Site preparation is absolutely necessary to establish windbreaks. Site preparation should begin the year before planting. Existing vegetation, possible

erosion hazards and potential rodent problems need to be taken into consideration.

On grass covered sites, herbicide application in the spring of the year while the grass is actively growing is ideal. Plowing in the fall, (and ripping if a soil hardpan is present) followed by disking in the spring just prior to tree planting will create a good, clean planting bed. Voles will tend to stay away from areas that are tilled and free of vegetation.

On cropland sites, site preparation may only depend upon weed density. If weeds are present, the site may only require disking just prior to tree planting. However, if voles are present during the fall prior to planting, the site should be disked at that time to reduce cover and food for the voles.

Site preparation objectives should basically target clean, weed free conditions with minimal plant residues remaining at planting time that could be used for food, hiding, or nesting cover by voles.

PLANTING

Good site preparation, quality plant material, proper handling, and planting techniques will result in successful establishment. The use of weed barrier material greatly enhances survival, growth, and also conserves soil moisture, but may also create habitat for voles. With proper site preparation, use of quality plant materials, and proper planting techniques, vole damage may be reduced to an acceptable threshold level.

POST-PLANTING CARE

Experience shows that windbreaks are most susceptible to damage from voles during the first two years of establishment. The windbreak should be inspected frequently during the first two years of establishment for signs of damage. Look closely around the base of the plant for gnaw marks and for runways and holes. If vole activity is present, its time to begin serious control measures. Remove weeds and mulches such as hay or straw from around tree trunks.

Windbreak plants that are severely damaged during the first year of establishment should be replaced the next growing season. Hopefully by the second growing season, vole populations have been controlled and further replacement of windbreak plants will not be necessary.

A question, which commonly arises, is "should I plant grass between the tree rows in a windbreak?" The answer is yes, but it may be beneficial to cultivate between the rows for 2 - 3 years to allow the trees to establish. Remember that heavy cover attracts voles and windbreak plants are most susceptible to vole

damage the first two years of establishment. After the windbreak has become established, planting grass between the rows will reduce weed growth and eliminate cultivation. Avoid planting grasses that form a dense sod or produce abundant top growth. The grass should be maintained at a short height to reduce vole habitat.

Chemical Control

Rodenticides provide the quickest and most practical means for controlling large populations of voles. Rodenticides for vole control are usually applied to food baits such as small grains or synthetic pellets. In the past, rodenticides were applied to fresh fruits or vegetables but use has declined because they are perishable and require more time to prepare.

Rodenticides are classified as acute (fast acting) or chronic (requiring multiple feedings over a period of days to consume a lethal dose). Products with the active ingredient zinc phosphide are fast acting, usually requiring only a single feeding. The animal ingests the poison, which converts to phosphene gas in the presence of moisture, which kills the animal. All products with zinc phosphide are restricted use pesticides that may only be applied by certified pesticide applicators. The only acute rodenticide labeled for voles is zinc phosphide.

Grain baits treated with zinc phosphide can not be applied to bare ground. Placing bait in holes or in bait stations is preferable to minimize accidental feeding by non-target animals and birds. It is important that grain baits remain dry because moisture activates the poison. Pelted formations are less prone to damage from moisture but care should be taken to ensure they do not become wet.

Warfarin is the oldest of chronic rodenticides and is still commonly used however; resistance has developed in many areas.

Mechanical Control

Mouse snap traps can be used to control small populations by placing the trap perpendicular to the runway with the trigger end in the runway. A peanut butter-oatmeal mixture or slices of apple make good baits. The best time of year to trap voles is during the fall and late winter. However, trapping is not effective in controlling large vole populations because time and labor costs are prohibitive.

The trunks of small trees may also be protected by hardware cloth (1/4 or 1/8 inch mesh) but this method may be too time consuming for a large windbreak. And of course, it may be helpful to have some domestic cats around.

REFERENCES

- Boehner, P. and J. R. Brandle, 1991. Windbreak Establishment. University of Nebraska Extension publication EC91-1764-B.
- Finnigan, B. F., 1999. Just the Facts-Sheet Meadow Mice (Vole) Infestations. University of Idaho.
- O'Brien, J. M., 1994. Voles - Prevention and Control of Wildlife Damage. University of Nebraska and United States Department of Agriculture, Animal and Plant Health Inspection Service.
- Tobin, M. E. and M. E. Richard, 1993. Vole Management in Fruit Orchards. Biological Report 5, March, 1993. U.S. Department of Interior, Fish and Wildlife Service, Washington, D.C.