



## PROTECTING WOODY PLANTINGS FOREST STEWARDSHIP MANAGEMENT NOTE #13

### INTRODUCTION

Planting trees or shrubs can be one of the most useful and satisfying practices a landowner can undertake. However, in some areas, browsing livestock or wildlife can destroy much hard work unless young plants are protected.

This Note gives general guidelines for tree protection structures and summarizes considerations for tree shelters and other methods of protecting seedlings of trees and shrubs.

### GENERAL GUIDELINES

Seedlings often need protection for 5 years or more, so protective devices should be durable for this period.

To protect seedlings from deer browsing, structures should be 4-6 feet tall (FSMN #3,42). Two foot high barriers may be enough to deter rodents and rabbits (#5,7).

### TREE SHELTERS

1. **PURPOSES** - In the late 1970's, plastic tubes, called tree shelters, were developed in England and introduced to the United States soon thereafter. In addition to protecting seedlings from browsing, tree shelters can, under certain circumstances, serve several other functions, such as: increase seedling survival and growth rate through moisture retention and a greenhouse effect, improve growth form of seedling planted for timber production, protect seedlings from herbicide drift and mowing machinery, and help managers locate seedlings. It is important to note, however, that shelters do not eliminate the need for weed control.
2. **RESEARCH RESULTS** - Results of research on tree shelters in the United States are quite preliminary, but indications are that they can substantially increase growth rates of oak and ash seedlings (#4,5,6). The growth of conifer seedlings does not appear to be increased as much by shelters as does that of hardwood seedlings (#6). Research on other species is ongoing.

In addition to their use with planted seedlings, tree shelters also show promise for establishing plantations by direct seeding (#11,12, FSMN #11) and for enhancing regeneration of naturally established seedlings where deer browsing is a problem (#2,12,15).

3. **SURVEY RESULTS** - In addition to experimental research, a survey of tree shelter use that included 73 foresters working with many species of trees in the northeast indicated that about 75% of the users had good results and that few problems were encountered (#3). Nevertheless, only 55% of the respondents would recommend tree shelters, mainly due to their high cost. Technical problems included breakage of stakes, trapping of bluebirds (now preventable with netted tops), wasps (hazard to people), possible attraction of insect pests, winter die-back of terminal shoots, and the continued need to support stems for 1-2 years after they grow above the shelter.
4. **RECOMMENDATIONS** - Landowners planning to use tree shelters should study one or more of the general publications on the topic (#5,6), consult local foresters or landowners with experience using shelters, and obtain information from several suppliers. Regardless of the type of shelter used, frequent inspection is needed to detect possible problems and to repair or replace damaged parts.
5. **AVAILABILITY** - Several sizes and types of tree shelters, including cone-shaped models for conifers, are now available, and prices have become more competitive (see FSMN #43 for suppliers). Homemade models can be constructed with stakes, staples, and construction grade plastic sheeting (#5,7,9). Certain

specifications must be met to qualify for SIP cost-sharing (#7).

## FENCING

For large plantings that are threatened by browsing, fencing the entire area is the best solution (FSMN #3). Where fewer trees (or shrubs) are involved, such as apple trees planted for wildlife, fences can be constructed around each tree with stakes and welded wire fencing (#9).

## OTHER METHODS

1. NETTING/MESH - Tubes of flexible netting (cut from rolls) can be placed over seedlings when they are planted to reduce browse damage to conifers, but these are not successful with hardwoods (#8). Rigid mesh tubes are also available that are designed primarily to reduce browsing (FSMN #43). Netting and mesh tubes are much less expensive than solid-walled tree shelters, but they are designed only to reduce browsing and they are shorter-lived.
2. CHEMICAL REPELLENTS - Many substances, from human hair to mountain lion urine, have been tried for repelling deer and other damaging wildlife. Success has been mixed, but several repellents are now commercially available (FSMN #42,43).
3. HABITAT MANAGEMENT - Where stem girdling by rodents or rabbits is a problem, the best protection is the elimination of weed and brush cover in and near the planting (#8). This reduces food and shelter for the animals and has the additional benefit of suppressing competing vegetation. Additional information on the control of rodents and rabbits is available from the U.S. Fish and Wildlife Service and elsewhere (#1,13). For a comprehensive treatment of wildlife damage prevention and control measures, consult Reference #12.

## REFERENCES

FSMN #'s refer to other Forest Stewardship Management Notes in this series.

- #1 Byers, R.E. 1984. Control and management of vertebrate pests in deciduous orchards of the eastern United States. Ch. 7 in Horticultural Reviews Vol. 7.
- #2 Kittredge, D.B., et al. 1992. The use of tree shelters with northern red oak natural regeneration in southern New England. Northern Journal of Applied Forestry 9(4):141-145.
- #3 Lamson, N. 1991. Results of tree shelter survey. Forest Management Update, Issue 12, USDA Forest Service, Northeastern Area State and Private Forestry.
- #4 Lantagne, D.O., et al. 1990. Tree shelters increase heights of planted oaks in a Michigan clearcut. Northern Journal of Applied Forestry 7(1):24-26.
- #5 Lantagne, D.O. 1989. Increasing hardwood planting success using tree shelters. Michigan State University Forestry Fact Sheet 12.
- #6 Meyer, D.A. 1992. Tree shelters for seedling protection and increased growth. University of Wisconsin Extension Forestry Facts No. 59.
- #7 Michigan Department of Natural Resources, Forest Management Division. 1992. Stewardship Incentive Program (SIP) practice standards & specifications manual.
- #8 Michigan Department of Natural Resources, Forest Management Division. 1989. Establishing hardwood plantations. Forestry Information Bulletin No. 8-4.
- #9 Michigan Department of Natural Resources, Forest Management Division. Undated. Tree shelters.
- #10 Paxton, M.W. 1986. A remedy for deer browse on conifers. Forest Management Update, Issue 5, USDA Forest Service, Northeastern Area State and Private Forestry.
- #11 Severeid, L. 1992. Direct seeding using tree shelters: Establishing walnut and oak plantations. Woodland Management (Wisconsin Woodland Owners Assoc.), Winter 1992.
- #12 Smith, H.C. 1993. Development of red oak seedlings using plastic shelters on hardwood sites in West Virginia. USDA Forest Service Research Paper NE-672.
- #13 Timm, R.M. (ed.). 1983. Prevention and control of wildlife damage. Great Plains Agricultural Council Wildlife Resources Committee and University of Nebraska Cooperative Extension Service.

#14 U.S. Fish and Wildlife Service and Purdue University Cooperative Extension Service. Undated.

Controlling rabbits (AC 310), Controlling field voles (field mice) (AC 303), and other animal control bulletins.

#15 Walters, R.S. 1993. Protecting red oak seedlings with tree shelters in northwestern Pennsylvania. USDA Forest Service Research Paper NE-679.

#16 Windell, K. 1991. Tree shelters for seedling protection. Missoula Technology and Development Center, USDA Forest Service.

**CITATION:** Burnett, Christopher D. 1994. Protecting woody plantings. Michigan Forest Stewardship Management Note #13. Michigan Department of Natural Resources, Forest Management Division.

**ACKNOWLEDGEMENTS:** This project was supported, in part, by a grant from the Michigan Department of Natural Resources and the USDA Forest Service.