

SHELTERBELT RENOVATION EVALUATION PROJECT

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SUMMARY:

The past years of drought, additional environmental stresses and other factors have caused deterioration of the health of area shelterbelts. In response to this increased concern, a shelterbelt renovation alternatives project was established in 1994 at the Dickinson Research/Extension Center.

The initial project was a collaboration with the Central Stark and Western SCDs, the Stark-Billings County Extension Office, the Dickinson Research/ Extension Center, NDSU Department of Plant Sciences, the Dickinson Parks & Recreation District, the Natural Resources Conservation Service, the Master Forestry Volunteers and local individuals.

Funding of this project was obtained through a \$1,000 matching grant through the North Dakota Forest Service Windbreak Renovation Grant funds.

INTRODUCTION:

Due to the declining vigor of numerous area shelter belts, producers are asking for assistance on methods of renovating existing shelter belts. Two major project objectives were identified: 1) to evaluate renovation alternatives; and 2) to evaluate responses of different tree species in a renovation setting.

MATERIALS AND METHODS:

In the initial year of this project, the renovation site was prepared. This included the removal of dead trees by local volunteers and Dickinson Research/Extension Center staff members. Trees were cut down with a chain saw and removed. Roundup herbicide was applied to burn down perennial grasses and other weeds at the site.

Tillage of the site consisted of the use of a disk and rototilling. This was done prior to planting in the spring of 1995.

Trees were planted on June 8, 1995, using the local SCD's tree planter. A portion of the trees were planted directly into an untilled site to compare performance in till vs. no-till planting situations. Weed barrier was used in the entire planting. Tree survival was evaluated in the fall of 1995 and the spring of 1996. Dead trees were removed and replanted by hand. Replacement trees were provided by the Western and Central Stark SCDs.

Tree species included in the evaluation project are: Nannyberry, American Cranberrybush, Juneberry, Ohio Buckeye, Black Walnut, Douglas Fir, Siberian Larch, Colorado Blue Spruce, Ponderosa Pine, Eastern Red Cedar and Rocky Mountain Juniper. A total of 1,800 feet of trees were planted.

RESULTS AND DISCUSSION:

Survival of trees was evaluated on August 30, 1995. The highest survival rate of fruiting shrubs was the American Cranberrybush at 95 percent; followed by Juneberry at 87 percent; and Nannyberry at 67 percent. The low survival rate of Nannyberry may indicate that it may require special handling at planting or may be sensitive to the weed barrier fabric.

Both the Black Walnut and Ohio Buckeye were grown in tree shelters. The Black Walnut had the highest survival rate of 88 percent. The survival of the Ohio Buckeye was at 50 percent. It was also observed that we had leaf scorch on both species due to the hot conditions in the tree shelters.

A total of four conifer species were evaluated in this renovation project. Colorado Spruce and Ponderosa Pine had the highest survival rate at 88 percent and 78 percent respectively.

The Rocky Mountain Douglas Fir was from a Denbigh, North Dakota, seed source, and had a 50 percent survival, and disappointingly, the Siberian Larch had a 0 percent survival. The difference may be related to species handling at planting or the tolerance of Siberian Larch to conditions produced by the weed barrier.

The shelterbelt renovation project was again evaluated in the spring of 1996. It was observed that additional trees were lost over winter. It was especially noticeable that there was more dieback on the Ponderosa Pine compared to the Colorado Blue Spruce. Other tree species appeared to survive the winter quite well.

The following replants were made: Ponderosa Pine--13; Colorado Blue Spruce--5; Siberian

Larch--13; Douglas Fir--13; Ohio Buckeye--6; Black Walnut--7; Nannyberry--14; American Cranberrybush--5; Juneberry--6; Rocky Mountain Juniper--9; and Eastern Red Cedar--14.

Evaluation of this renovation project will be conducted again in the spring of 1997. Dead trees will again be replaced.

[Back to 1997 Research Report Table of Contents](#)

[Back to Research Reports](#)

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