

Techniques for Improving the Survivorship of Riparian Plantings

The Stroud Water Research Center has recently completed a long-term research project on the best techniques to establish native riparian forest buffers along streams in the Piedmont watersheds of Pennsylvania. Sweeney (1993) indicates that poor survival can be expected for planted seedlings, due to competition from weeds, drought, and animal predation. He stresses that weed control (twice annual mowing or careful application of herbicides) was the major factor influencing the survival rates of seedlings.

After 11 years in a test plot, 73% of seedlings survived where weed control had been practiced, as compared to a mere 7% where it had not. Most of the mortality occurred in the first three years after planting.

The use of tree shelters (four foot tall plastic tubes enclosing the seedling) was found to sharply increase the growth rate and survivorship of seedlings. For example, the height of red oak and black walnut were 1.6 and 2.4 times greater for the sheltered versus unsheltered seedlings. Sweeney suggested that the higher growth rate for these relatively slow growing species afforded by tree shelters may help ensure that these species are adequately represented in the final riparian forest canopy.

Tree shelters increased survivorship by 70 to 85% for tulip poplar, red oak, and black walnut but had little impact on white ash. The tree shelters were thought to reduce animal predation, weed competition, and reduce water loss due to wind. Tree shelters were demonstrated to increase drought tolerance, particularly at drier up-land sites.

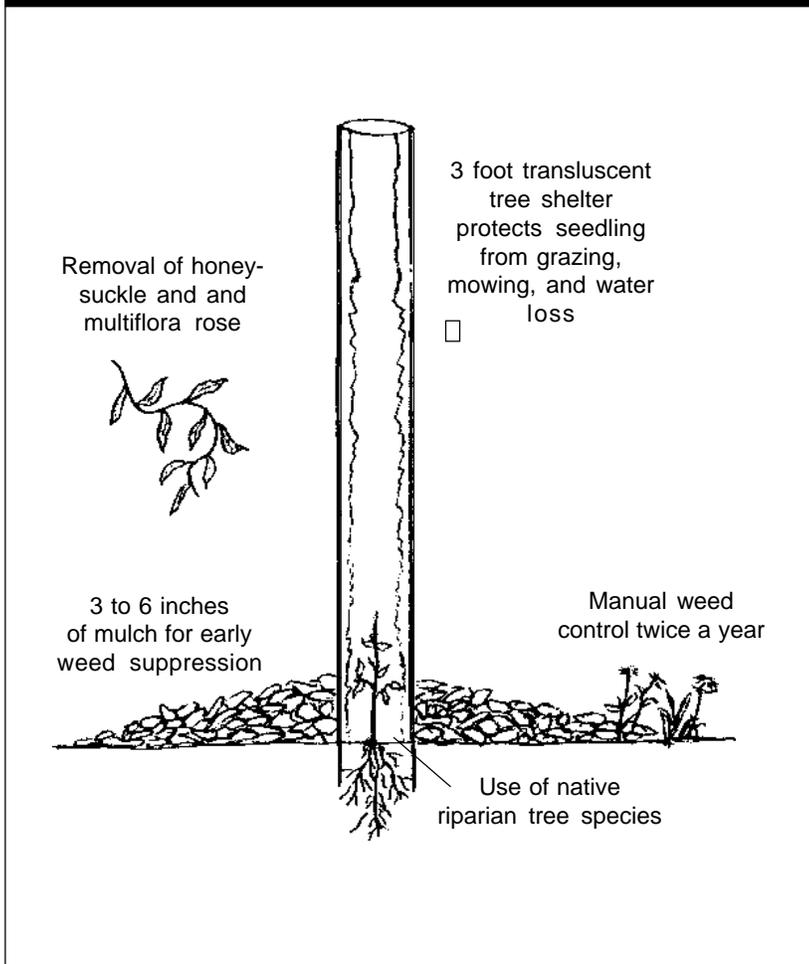
Sweeney recommends several measures to improve the success rate in establishing riparian forest cover in the Northeastern U.S. (Figure 1) They include the following:

- Site preparation should focus on the mechanical removal of exotic species such as honeysuckle and multiflora rose, if they are present;
- Tree species should be selected to match local soil and moisture conditions;
- A mix of successional species (weed control, no shelters) and climax species (tree shelters) on a three meter spacing should be used.

Sweeney suggests that a riparian forest can become established within seven to 10 years using techniques such as these.

—TRS

Figure 1: Techniques to Improve Seedling Survival in Riparian Reforestation Projects (Sweeney, 1993)



Reference

Sweeney, B.W. 1993. *Effects of Streamside Vegetation on Macroinvertebrate Communities of White Clay Creek in Eastern North America*. Proceedings of the Academy of Natural Sciences of Philadelphia. (144): 291-340.