

Site Selection, Design, Preparation

Hybrid Poplar Best Management Practices

Site Selection and Suitability

There are many factors to consider when selecting a suitable site for poplar planting in Minnesota. These are soil factors, location, and operational factors. Poplars grow “best” on well-drained fertile, agricultural soils where there is adequate annual rainfall or irrigation available, and a frost-free growing season of over 150 days. Unfortunately, increasing land values in Minnesota often make this land use option uneconomical for growing poplars. The soil surveys done during the advanced planning period are useful in site selection. It is important to use the “best” available sites for growing poplar and avoid planting poplars on “poor” sites. The following soil properties are most important for growing poplar:

- Soil type and texture: Sandy loam to clay loam
- Soil moisture and drainage: Moist soils, not excessively drained
- Soil aeration and depth: No hard pan, deep soil profile
- Soil pH: 5.0 to 7.5
- Soil fertility: Organic matter 3 to 8%, adequate Nitrogen, moderate to high Phosphorus and Potassium

Since poplars can be a short lived tree, a harvest and marketing plan needs to be considered when determining site selection and plant design. The location of the site is important. Access is important for cultural practices, harvest, and transportation to markets. Pulp and biomass markets are possibilities. They should not be planted in areas designated environmentally sensitive. The plantings should not be under overhead power lines or over underground utilities. Also, plantings should not be within 50 feet of tile lines. The size and shape of the planting should be compatible with equipment and adjacent parcels. Long rectangular fields are more energy and cost efficient to manage. Site selection will vary with each project and purpose. Consideration must be given to plant hardiness zones in Minnesota when selecting clones and sites for poplar planting.

Planting Design

There are many Agroforestry practices that could include hybrid poplar plantings as part of the design. Tree and shrub species used on a planting will depend on the purpose and the design of the planting.

Types of planting designs:

- Windbreaks/Shelterbelts/Living Snow Fences/Timberbelts
- Animal Confinements
- Livestock Waste Disposal
- Riparian Buffers
- Block Planting
- Biomass and Bio-Energy Plantings
- Wellhead Protection
- Phytoremediation

These planting designs are reviewed in depth from an online publication, “BMP’s for Growing Hybrid Poplar in MN” found on the web at: www.extension.umn.edu/agroforestry.

Poplar tree spacing is very dependent on the desired planting design. Wider spacing will encourage longer and taller growth while narrow spacing would encourage short term management and harvest. For

example a wood product design may be spaced 12 x 8 foot or 12 x 12 foot spacing equaling 450 to 300 trees per acre to be harvested in 12 to 15 years, while a biomass/bioenergy design may suggest 4 x 4 foot spacing or 2700 trees per acre which would produce 4 to 6 inches in diameter in a 6 to 8 year harvest. It is important to know the goal or purpose of the planting before trees are planted.

Site Preparation

Site preparation for poplar plantings in Minnesota varies greatly with site and location. It is not advisable to convert existing woodlots to poplar; woodlots offer the owner other options. Poplars are often planted on upland abandoned lands, marginal lands, previously cropped land, or more recently in riparian lowlands. The site preparation methods vary greatly with site. Competition control is essential for establishing poplars on any site; no-till is not a good option for poplar plantings except when soil temperatures are high and soils have been under no-till for years. No-till is also preferred in certain phytoremediation applications when augering is used.

Year One

In all cases the selected site should be mowed or rotary cut in the year before planting and then sprayed with Roundup (or equivalent) on upland sites, or Rodeo or equivalent on riparian sites.

Plowing should be avoided except in cases where thick sod is being converted. On upland sites where there is a hardpan or plow layer, chisel plowing or deep tillage to 1 foot depth should be used to break up the hardpan to improve soil aeration and tree root penetration. Aeration is critical for poplar growth. When the sites are small (less than 2 acres) augering through the plow layer with a tractor mounted or hand held auger may be a good alternative especially around livestock confinements and contaminated soils where phytoremediation is the goal.

If disking after the glyphosate application is considered, note that this practice may bring up new weed seed populations. On former agricultural land seeding a cover crop such as oats or annual rye in the fall before planting is a recommended BMP if winter erosion is possible. With riparian sites mowing strips or large individual circles followed by glyphosate applications is recommended. Landowners that are seeking Forest Stewardship Certification (FSC) are restricting their herbicide use to glyphosate and eliminating all other herbicide uses especially during site preparation.

Year Two – Year of Planting

In the spring of year two, another glyphosate application may also be needed prior to planting to control perennial weeds. Additional mowing, disking or field cultivation can be considered if absolutely necessary. Mulching to control weeds during the year of planting is also effective especially on smaller tracts. Sawdust, wood chips, and bark are good natural mulches. Straw is not recommended as it harbors rodents that damage young trees.

For more information visit:

www.extension.umn.edu/agroforestry “Growing Hybrid Poplar in MN”

Authors

Diomy Zamora, Extension Educator, Forestry, zamor015@umn.edu

Gary Wyatt, Extension Educator, Forestry, wyatt@umn.edu

Jud Isebrands, Forestry Consultant, efcllc@athenet.net



Herbicide applicator on ATV



Cultivated poplar planted field (spring growth)