

# Plant Material Selection

## Hybrid Poplar Best Management Practices

### Introduction and Caution

A key to success of a poplar planting is matching the proper species and clone to the site. This choice is a difficult task in Minnesota because of the heterogeneous soils and varying microclimate from south to north and from east to west in the state. Consideration must be given to soil type, soil pH, water availability, drainage, microclimate of the specific region of the state, pests and diseases, and availability of suitable poplar clonal material. Many of the plantation failures in the state are due to planting improper clones for the site.

### Species and Clones

There are just four clones that are most widely recommended and available in Minnesota as follows: 1) DN-17 (Robusta), 2) DN-34 (Eugenei), 3), DN-182 (Raverdeau), and NM-6. Of these four clones, only DN-34 and NM-6 survive over an entire 12 year rotation or production period throughout Minnesota because of the presence of a stem forming canker disease known as *Septoria* canker, although *Septoria* has recently been identified in NM 6 plantings throughout the US Midwest. The other two clones, DN-17 and DN-182 and many others such as Siouxland are not resistant to *Septoria* canker and should not be planted in block plantations in Minnesota. Other clones that have potentials in Minnesota are: 1) DN2, 2) DN5, 3) DN70, 4) NE 222, and 5) I 45/51.

### Considerations

**Know the condition of your site/area.** There have been some successes with windbreak and shelterbelt plantations of various hybrid poplar clones. However, plantations of *Septoria* damaged trees can be found throughout Minnesota. Always check for *Septoria* canker disease. *Septoria* canker disease can change over time and gradually infect previously resistant clones (Ostry and McNabb, 1986, Hansen et al, 1994). Another important consideration to make on choice of poplar clone is whether the site to be planted is an upland or riparian site. Table 1 lists the recommended poplar clones by region of Minnesota and the type of site a particular clone could survive. Many of the hybrid poplar clones do not perform in periodically flooded soils. Native eastern cottonwood and cottonwood hybrids perform better on these soils, as well as certain hybrid poplars that have been tested in riparian zones. Consideration must be given to the hardiness zones when choosing a poplar clone. For example, clones suitable for northern Minnesota will not perform the same as clones suitable for planting along the Iowa border in the southwest. For some northern sites aspen and balsam poplars may be a good choice while eastern cottonwood clones and hybrids will do well in the south.

**Maintain diversity of poplar clones on the site.** Planting mosaics of two or three poplar clone blocks with corridors between them will provide better wildlife habitat and decrease the plantation susceptibility to insect pests, diseases, and wind damage.

Another problem in clonal selection is that not all nurseries are selling “properly named” poplar clones that have been tested in the area and that are pest and disease resistant. Often the cheapest and most advertised clones are not the “best”, so **buyers beware.** (Dickmann and Isebrands, 1999)

## Recommendations

1. Match the poplar clones to the site. Choose two or three poplar clones from the recommended clones.
2. Choose only clones tested in the region of the state that trees are to be planted.
3. Purchase stock from a responsible nursery – the cheapest is not usually the “best”.

## Combining Poplars with Willows and prairie plants for water quality and wildlife

Willows, shrubs, prairie grasses and wildflowers are often used in multi-species riparian buffers with poplars and other long-lived tree species (Schultz et al, 2004). Using these species in riparian areas has shown to be very effective in improving water quality and wildlife habitat in the Midwest. Native willows are preferred in the streambank stabilization zone of the multi-species buffer. Native prairie grasses and wildflowers are used for multi-species buffer adjacent to the agricultural crop. The prairie grass slows down water entering the buffer, traps sediments and chemicals, and provides diverse habitat for birds and other animals.

## Agroforestry application of Hybrid Poplar

There are a number of agricultural crops that can be used as intercropped with hybrid poplars in context of alley cropping Agroforestry systems. The choice of crop in Minnesota depends upon individual farmers' preferences, soils, and markets. However, the duration of inter-cropping opportunities varies with the spacing between the poplar rows in the field. Traditional 10 foot rows allow alley cropping for the first 2 to 3 years before tree canopy closure. Longer durations are possible with wider spacing such as 20 to 30 feet between rows.

The following crops have been successfully used for inter-cropping with poplars in different parts of the world (Nair, 1993): barley, buckwheat, clover, corn, lespedeza, melons, oats, potatoes, rye, soybeans, sugar beets, sunflowers, vegetables, vetch and wheat. Almost any crop can be used in inter-cropping with poplar if properly designed.

For more information visit:

[www.extension.umn.edu/agroforestry](http://www.extension.umn.edu/agroforestry) “Growing Hybrid Poplar in MN”

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## References:

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- Nair, P.K. 1993. An Introduction to Agroforestry. Kluwer Acad Publ., Dordrecht, Netherlands. 499 pp.
- Ostry, M.E. and H.S. McNabb, Jr. 1986. *Populus* species and hybrid clones resistant to *Melampsora*, *Marssonnia* and *Septoria*. USDA North Central Forest Experiment Station Res Paper NC-272. 7pp.
- Schultz, R.C. et al. 2004. Riparian forest buffers in agro-ecosystems – lessons learned from Bear Creek Watershed, central Iowa, USA. *Agroforestry Systems*, 61:35-54.

**Table 1. List of recommended poplar clones suitable by region of Minnesota and site.**

<u>Clone Name (#)</u>	<u>Parentage</u>	<u>Native (Y/N)</u>	<u>Site</u>	<u>Region of State</u>
Balsam poplar <sup>1</sup>	<i>Populus balsamifera</i>	Y	Shelterbelt	North
Crandon	<i>P. alba x P. grandidentata</i>	N	Upland	South
D105	<i>P. deltoids</i>	Y	Riparian	South
51-5	<i>P. deltoids</i>	Y	Upland	South
252-4	<i>P. deltoids</i>	Y	Riparian	South
7300501	<i>P. deltoids</i>	Y	Upland	South
80x00601	<i>P. deltoids</i>	Y	Upland	South
DN2	<i>P. deltoids x P. nigra</i>	N	Upland	North, West
DN5	<i>P. deltoids x P. nigra</i>	N	Upland	North, West
DN34(Eugenei)	<i>P. deltoids x P. nigra</i>	N	Upland	South, West
DN70	<i>P. deltoids x P. nigra</i>	N	Upland	South, West
DN154	<i>P. deltoids x P. nigra</i>	N	Upland	South, West
DN164	<i>P. deltoids x P. nigra</i>	N	Upland	South, West
DN170	<i>P. deltoids x P. nigra</i>	N	Upland	South, West
DN177	<i>P. deltoids x P. nigra</i>	N	Riparian	South, West
I 45/51	<i>P. deltoids x P. nigra</i>	N	Upland	South, West
NE222 (Caudina)	<i>P. deltoids x P. nigra</i>	N	Upland	South, West
NE264 (Volga)	<i>P. deltoids x P. nigra</i>	N	Upland	North, West
NM2	<i>P. nigra x P. maximowiczii</i>	N	Upland	South, West
NM6	<i>P. nigra x P. maximowiczii</i>	N	Upland	North, West
Northwest	<i>P. deltoids x P. balsamifera</i>	Y	Shelterbelt	North
Brooks #6 <sup>2</sup>	<i>P. deltoids x (P. laurifolia x P. nigra)</i>	N	Shelterbelt	North
Walker <sup>2</sup>	<i>P. deltoids x (P. laurifolia x P. nigra)</i>	N	Shelterbelt	North
Trembling aspen	<i>P. tremuloides</i> hybrids	Y	Shelterbelt/ Upland	North

<sup>1</sup> *P. balsamifera* selections – Canada

<sup>2</sup> Available in Canada



Unrooted Hybrid Poplar Cuttings