

# Afforestation Guidelines for the Prairie Provinces

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***The following site selection guidelines and recommended practices were developed for afforestation initiatives on agricultural lands that have not been forested for at least 12 years, and with the objective of establishing fast-growing species at high yields (8-10 times greater than the present rates associated with the commercial natural forests). Recommended afforestation practises are intended as guidelines, as treatments will vary depending on the condition and previous management of the site.***

*Afforestation is the establishment of tree plantations on land that has not previously been managed for forests. Emphasis is placed on maximizing the use of available land and resources with high yield tree species. Trees can either be of similar species or mixed in a manner that will result in a stand or forest.*

## **Site Selection**

- Soil texture: loams, silty clay, silty sand, and sandy clay
- Moderately well drained to rapidly drained
- Mesic moisture regime
- pH of 5.0 to 8.0
- Non-saline
- Light stoniness (surface boulders, bedrock, and cobble should be avoided)
- Flat to gently rolling topography
- Annual precipitation: 380 mm (15")
- Site potential: Class 5 land or better (Canada Land Classification)



## ***Site Preparation***

### **Timing:** Autumn Prior to Planting

- If the area is still actively growing prior to tillage being completed, a broadcast Glyphosate application should be completed.
- The soil should be tilled to a depth of 30 cm (12") in the autumn prior to planting. This deep discing should be completed using a double-pass system in which the second pass should be completed in a direction perpendicular to the primary discing treatment.
- Approximately 3 weeks following the deep discing, a shallow discing, harrowing, or combination treatment should be completed to create a level and more finely mixed surface environment. If soil conditions do not facilitate the completion of this treatment during the autumn prior to planting, the treatments can be completed early the following spring.

### **Timing:** Spring of Planting

- A broadcast Glyphosate application should be completed following vegetation green-up. This Glyphosate application may be completed in conjunction with a systematic tree position marking operation. Tree position marking can be completed separately if not completed with the chemical application. Trees should be marked in straight parallel rows, perpendicular to the primary access route.

## ***Planting Operations***

### **Timing:** Early May – Late June

### **Soil Temperatures:**

Planting operations occur following the tree marking and once the soil temperatures have reached a minimum of 8°C for container and bareroot rooted cuttings and 12°C for non-rooted cuttings.

## ***Stock Types***

Three types of stock are available for establishing hybrid poplar plantations:

1. Cuttings: 25-30 cm long, 0.5-1.5 cm in diameter
2. Bareroot rooted cuttings
3. Container rooted cuttings

Each stock type has its advantages and disadvantages, and the decision about which type of stock to plant on each site depends on the moisture, soil conditions, and climate conditions of the site. Each stock type has different conditioning regimes that must be followed. Conditioning of stock refers to the treatment required to prepare it for planting. This includes allowing the stock to leave its dormant state, such as in the case of over-wintered cuttings, and ensuring it is ready to flush once planted.

The coordination of conditioning and planting operations is extremely important. All stock should be planted within 4 hours of being removed from conditioning.

## Cuttings

Cuttings are stored in freezer storage at a temperature of  $-2$  to  $-5^{\circ}\text{C}$ . When the sites are ready for planting, stock should be conditioned by soaking it in room temperature water for a period of 24 to 48 hours. Cuttings should be soaked in a vertical position with the buds pointing up, with only the top quarter out of the water. Protection from direct sunlight is also advised.

After conditioning, the cuttings should be kept moist and stored in the shade during planting operations. The stock being planted should be carried vertically, with the buds pointing up, in pails or planting bags. The planter should ensure that only the amount of stock that can be planted in 3 to 4 hours is removed from the shade.



Cuttings are to be planted with the buds pointed up, with a maximum of 1 cm of the cutting visible above the ground. Holes for the cuttings should be created using a planting shovel or a 30 cm planting dibble. Care must be taken to ensure the cutting is not pushed into the soil, as this can damage the buds. Following placement, the soil surrounding the cutting should be lightly compacted to ensure there are no air pockets. Cuttings should flush within 5 to 8 days following planting.

## Bareroot Rooted Cuttings

Bareroot rooted cuttings are stored in cold storage at temperatures ranging from  $-1$  to  $-5^{\circ}\text{C}$  until 3 days prior to planting. At this time they are removed from cold storage, placed in a shaded location, and thawed at a temperature of  $3$  to  $8^{\circ}\text{C}$ . Prior to planting, the stock should be soaked for 12 to 18 hours.

Following conditioning, bareroot rooted cuttings should be kept moist and stored in the shade during planting operations. The stock being planted should be carried vertically, with the buds pointing up, in pails or planting bags. The planter should ensure that only the amount of stock that can be planted in 3 to 4 hours is removed from the shade.

Bareroot rooted cuttings are to be planted at a depth that covers the roots with 5 to 10 cm of soil. Holes for the rooted cuttings should be created using a planting shovel and should be large enough to receive the bareroot plant so that the roots are distributed symmetrically around the stem. Following placement, the soil surrounding the bareroot rooted cutting should be lightly compacted to ensure there are no air pockets next to the roots.

## Container Rooted Cuttings

Container rooted cuttings are stored in cold storage at temperatures ranging from  $-1$  to  $-5^{\circ}\text{C}$  until 3 days prior to planting. At this time they are removed from cold storage, placed in a shaded location, and thawed at a temperature of  $3$  to  $8^{\circ}\text{C}$  until the containers are thawed. Prior to planting, the containers should be soaked for 1 to 2 hours to ensure the plugs are saturated. The length of time required to saturate the plug will vary depending on the moisture present in the container after thawing.

Following conditioning, the container rooted cuttings should be kept moist and stored in the shade during planting operations. The stock being planted should be carried vertically, with the buds pointing up, in pails or planting bags. The planter should ensure that only the amount of stock that can be planted in 3 to 4 hours should be removed from the shade.

Container rooted cuttings should be planted at a depth that ensures the containers are covered with 2.5 to

5 cm of soil. The holes for the rooted cutting should be created using a planting shovel and should be large enough to receive the container vertically without bending it. Following placement, the soil surrounding the container should be lightly compacted to ensure there are no air pockets.

### ***Growth Expectations***



2 years



6 years



20+ years

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