



WOODLANDS

EXTENSION

NOTES



Planning to Establish a Forest in Open Fields Getting Help and Getting Started

Extension Circular
1001

Introduction

This Extension Note is intended to be used as a general guide for planning a tree planting project. Planning ahead can make the difference between success and failure in establishing a plantation. Why not do it right the first time? A successful plant will take open land and, with time, turn it into a productive forest providing opportunities for multiple forest uses and benefits for the individual landowner and society in general.

Using the information contained in this extension note will give you the best opportunity to successfully establish your tree plantation. More detailed information is available by contacting your local area office of the Ministry of Natural Resources (MNR). Good luck with your new forest!

Woodlands Extension Notes are technical fact sheets prepared for private woodland owners and enthusiasts in southern Ontario. This extension note was prepared by the Ministry of Natural Resources (MNR) in cooperation with the Trees Ontario Foundation. For further information of Woodlands Extension Notes inquire at the nearest MNR field office in your area.

Advance Planning Is Crucial

To successfully establish a tree project, you should plan one to two years before the anticipated planting season. You should prepare a planting plan and map of the property to be planted (a sample of each is attached).

If you are serious about planting trees, there are three key factors that will have to be considered in order to ensure a successful project.

- ◆ **Your objectives and available resources.** That is, "Why am I planting trees? What purpose do I want the trees to serve?" Consider also the time, money and equipment available to prepare the site, plant the trees and weed/tend them for several years after planting. You should be realistic about how many trees you can plant.
- ◆ **Characteristics of the site to be planted.** The size of the site, location, exposure, drainage, topography and soil texture will dictate, to a large extent, the species that is best suited to that site.
- ◆ **Following good establishment practices.** Assistance and advice is available from the MNR and other agencies. There are many methods to prepare the site (site prepare), plant and care for (tend) a plantation. The method chosen will be dependent on the landowners objectives, available resources, quality of the site and species selected.

Figure 1

TIMETABLE FOR PLANNING A TREE ESTABLISHMENT PROJECT
Year One (Summer and early Fall)
Seek advice from forestry extension staff: Contact MNR, conservation authority, other agency for advice Prepare planting plan, map of property (attached) Prepare site: Control weeds and brush, furrow and disc (if wet) Lay out other aspects of site: Fireguards, access roads, access to water Order nursery stock
Year One/Two (Late Winter/Early Spring)
Nursery invoice and reservation card arrive Arrange for equipment and labour for planting Receive and handle seedlings (April 1 - May 24 in Southern Ontario) Planting within two days of receipt of seedlings Review weeding and other protection measures
Year Two+
Continue as required with: <ul style="list-style-type: none"> • weeding • tending • corrective pruning

Landowner's Objectives and Resources

Decide what you want from your new forest. You can design your forest to provide for multiple forest uses. You may want your forest to:

- ◆ improve the environment;
- ◆ increase the value of the property;
- ◆ provide recreational opportunities;
- ◆ yield a wood product (such as lumber or fuel) or produce a specialized crop (such as Christmas trees or nuts);
- ◆ improve the quality of the site by planting trees to: rehabilitate an area; prevent soil erosion or provide a windbreak;
- ◆ make the site more aesthetically pleasing;
- ◆ provide habitat and food for wildlife;
- ◆ improve the water quality of nearby streams or creeks.

What results do you expect and in what time frame do you expect them?

The answer to these questions will have a bearing on the objectives you chose. For example: recreational results can be realized almost immediately if you enjoy working outdoors planting and managing your plantation; certain shrubs such as red-osier dogwood will produce berries that attract wildlife; as your plantation develops, it will provide shelter for many wildlife species; Christmas trees can be produced in eight to ten years; and sawlogs and veneer logs are produced in 50 to 120 years. It is wise to look into markets, especially for short term products, before making your decision.

What resources do you have available to carry out this project?

Some of the considerations are: time to prepare the site and plant and tend the trees; labour (friends and family members to assist you); equipment needed and the skill to use it; money to purchase trees, hire labour and obtain equipment.

Characteristics of the Site

The first step in planning for a plantation is to assess the site to determine if it is suitable for planting trees. You will need at least 1 foot (30 cm) of planting depth. In order to choose the appropriate species for the site you should be aware of the soil texture and drainage. To answer these and many more questions help and advice are available from your local MNR office.

Is your site close to your home?

Consider how much time you will need to spend travelling to the site, and how often you will need to go there. If you live nearby, it will be easier, less time-consuming, and more convenient to plant and tend your trees.

What was the site used for before?

Recently cropped farmland may have herbicide residues, which could affect the survival and early growth of planted trees. Try to find out what herbicides were recently applied and how long they persist on the site.

What species thrive in the area already?

This may provide an indication of which species may be naturally suited to the site and its conditions. For example, on a shallow site you may find white cedar growing

naturally. This could imply that white cedar is a good species for the site.

What is the lay of the land?

Is the land level, rolling or steep? Erosion can be a problem on hillsides and frost is a serious consideration in depressions. Also, it is difficult to manoeuvre equipment on steep slopes.

What is the local climate?

Is the site shady or sunny? Early spring frosts, seasonal flooding, and a short growing season may rule out certain species for planting.

What are the general soil conditions found on the site?

Soil texture - Is the soil coarse or fine? Is it stony? Is the soil deep or shallow? Is the site wet or dry? Does the soil drain well or poorly?

As a general guide when determining your soil properties, you should try to check every hectare. Also, you should take care to check hill tops and depressions.

Sandy soil feels grainy and will not hold together when moistened and clenched in your fist. When the soil is dry, little or no floury material will be mixed with the sand grains. Loamy soil will hold together slightly when moist, allowing careful handling and will feel somewhat grainy with evident floury material when dry. Fine loamy soil will hold together well when you moisten it, clench it in your fist and toss it from hand to hand. Fine loamy soil will also feel slightly gritty. It is almost all floury material when dry. Clay soil will hold together even more so than fine loamy soil, when moist it will form ribbons when rolled and will feel smooth. It will form clods and be sticky when moist.

Imperfectly drained sites will be saturated for at least part of the year (spring) within 30 cm or 1 foot of the surface. Fine textured moderately drained sites may be wet for brief periods in the spring but the surface usually drains quickly providing adequate rooting depth with good available moisture. Well-drained sites will not have any of these characteristics.

The following guide applies to southern Ontario (south of the French and Mattawa Rivers) and does not include Manitoulin Island.

To determine the soil texture and drainage in your area, consult county soil maps.

Figure 2: A Guide to Matching Species to Soils

SURFACE TEXTURE	NATURAL DRAINAGE		
	Well-drained	Moderate	Imperfect
Sand	white pine red pine European larch Norway spruce hard maple* red oak white cedar poplar black locust	white pine white spruce Norway spruce European larch white ash red oak* black cherry black locust poplar white cedar black spruce	white cedar green ash black spruce tamarack
Loam	white pine red pine European larch Norway spruce white spruce hard maple* white ash red oak black cherry* beech* red maple* basswood* black walnut bitternut hickory* white cedar poplar black locust	white pine red pine white spruce Norway spruce European larch hard maple* white ash red oak black cherry* basswood* red maple* beech* silver maple black walnut white oak* bitternut hickory* white cedar poplar green ash black locust black spruce willow*	Norway spruce silver maple* swamp white oak* green ash white cedar black spruce tamarack
Fine loam	white pine red pine white spruce Norway spruce European larch hard maple* white ash red oak black cherry* basswood* red maple* black walnut bitternut hickory* white cedar poplar green ash black locust black spruce	red pine Norway spruce European larch hard maple* white ash red oak red maple* black walnut white oak* bitternut hickory* red maple* beech* white cedar black locust poplar black spruce	Norway spruce silver maple red maple* white cedar black spruce tamarack
Clay	white pine Norway spruce European larch beech* black walnut red maple* white cedar black locust green ash black spruce	Norway spruce white ash beech* hard maple* poplar black spruce white cedar black walnut white pine	silver maple green ash black spruce tamarack

*not currently available from MNR nurseries

All or some species may be available from private growers

Figure 3

SPECIES USES			
High Value Wood Products		Fuelwood	
white pine red pine hard maple* red oak white spruce	black cherry white oak basswood black walnut white ash	European larch hard maple* bitternut hickory black cherry black locust white ash	red maple white oak red oak
Soil Stabilization - Erosion Control		Commercial Nut Crops	
red pine white spruce black locust white cedar Norway spruce	silver maple European Larch poplar	blackwalnut butternut	
Wildlife - Species			
red oak white oak beech* black cherry	dogwood red cedar mountain ash autumn olive	black locust multiflora rose high bush cranberry	

How does soil depth affect your species choice?

Only certain species can grow on shallow soils with less than 60 cm (2 feet) of soil over bedrock. On moderately drained shallow sites, you can plant white pine, Norway spruce, hard maple, bitternut hickory, jack pine, white cedar, black spruce or red oak. On poorly drained soils, you should plant cedar, tamarack or black spruce.

What weeds are present or expected on the site?

Grasses, broadleaf weeds and woody shrubs can be a serious problem. They slow down the growth rate, lower the productivity and decrease the survival rate of the tree crop you are trying to establish by competing for available site resources (water, nutrients and light). In addition, tall weeds may be weighted down by snow, crushing young seedlings nearby. Weeds may also provide an ideal habitat for rodents that will strip the bark from young succulent seedlings.

Similar to your vegetable or flower garden, providing an adequate level of weed control will benefit the successful establishment of your plantation. Weed control may be provided through mechanical cultivation, the use of herbicides and/or mulching, etc.

Good Establishment Practices

The success or failure of any plantation relies to a great extent on adequate operations undertaken to correct site deficiencies and reduce potential stress factors for the crop species. The following are the important steps for the establishment of a plantation: site preparation, including drainage, competition management and correction of other limiting factors; planting, including stock type, plantation spacing, methods of planting; and tending including continuing competition control, thinning and pruning.

What site preparation is required before planting?

The amount of preparation required – and the investment in time, money and equipment – depends on the site itself. Soil texture and drainage, the vegetation that is currently on the site, the species to be planted and the availability of equipment, are all factors to take into consideration.

In general, hardwoods require more weed and brush control than do many of the conifers. The amount of control is dependent on the tree species and the competition species. More detailed information is available from your local MNR office.

Site preparation may be carried out by ploughing, discing, furrowing, or a combination of these techniques. Common farm equipment will do the job.

Herbicides may also be applied to control competing vegetation. If herbicides are used, the manufacturer's instructions must be followed to the letter, proper protective clothing should be worn, and leftover materials must be disposed of correctly.

Site preparation should be carried out the year before planting so that the trees will have a head start on the weed competition as soon as they are in the ground.

Keep in mind that the more work you put into removing weeds before planting, the less weeding you'll have to do after planting.

How many trees to plant per hectare/acre, and how should the site be laid out?

The planting arrangement should be plotted on your planting map (see attached for a sample). The distance between trees, and between rows of trees depends on:

- * the species planted,
- * local conditions and
- * the size and type of equipment being used.

Generally plant conifers at 1.8 metres by 2.4 metres (6 feet by 8 feet). This would result in a plantation of 2300 trees per hectare (900 per acre).

Hardwoods are generally spaced 3 metres by 1.5 metres (10 feet by 5 feet) apart. Once again, this would result in a plantation of approximately 2200 trees per hectare (880 per acre).

These are general rules, spacing is species and objective specific.

What should I be prepared for on planting day?

The best season to plant trees is the spring, immediately after the ground has thawed. Nursery stock is provided on a first come-first served basis by provincial nurseries. Early submission of your application (8-12 months ahead) will enhance your chances of obtaining the required species and will provide sufficient time for consultation or a visit to your planting site.

Trees can be ordered through your local MNR office and picked up at your nearest provincial tree nursery. Nursery stock is perishable. Trees should be transported in covered vehicles and the roots must be kept moist at all times. They should be planted within two days of delivery. If you must store seedlings, be prepared to keep them in a cool, dark place so that the roots are not allowed to heat up. Trees should therefore be covered not only in transport but on the planting site to exclude heat, light and wind while maintaining a certain amount of air circulation.

On planting day, have enough people and equipment (shovels, carrying bags, water) to do the job. It is important to note when ordering your planting stock that on average, one person can only plant 300-400 trees per day. Therefore try not to over extend yourself. Above all, keep the seedlings' roots moist until they are planted.

What work should be done on the site after planting?

After planting, follow-up tending is largely a matter of maintaining an adequate level of competition control. This will increase your chances of successful plantation establishment.

You should also fence off plantations so domestic animals don't compact the soil, feed on, or trample down trees. A fireguard three to four metres (10-13 feet) wide should be ploughed around the plantation-especially if the site is near roads, trails, or railway rights-of-way. (These two suggestions are optional).

You should also plan to visit the site often, to prevent vandalism. Theft of trees, fire or damage by vehicles are potential problems. Spring tree planting time and "Christmas tree season" are critical times. The property should be posted with signs indicating the site is a "Managed Private Forest". As well, you need to check your

plantation regularly for the presence of insects and/or diseases.

Finally, plan for tending requirements fifteen and more years down the road. Trees may need to be thinned, pruned and otherwise tended.

Where to Get Technical Advice and Assistance

Ministry of Natural Resources

Check the blue pages of your telephone book under "Government of Ontario", then "Ministry of Natural Resources" for the nearest district office. Ask for the forestry extension section. They will advise you as to where you may obtain more information or information on related programs offered by other ministries or agencies.

Private assistance can be obtained from a consulting forester and planting contractors. Among those to contact:

- Board of Forestry Consultants of Ontario
Ontario Professional Foresters' Association
27 West Beaver Creek Road, Suite 102
Richmond Hill, Ontario
L4B 1M8 (416) 764-2921
- Ontario Silvicultural Contractors Association
55 McCaul Street, Box 171
Toronto, Ontario
M5T 2W7(416) 591-9337, ext. 171
- Ontario Forestry Association
150 Consumers Road, Suite 209
Willowdale, Ontario
M2J 1P9 (416) 493-4565

Trees are also available from private nurseries. For more information contact the nearest MNR district office.

Other Publications to Read

- Trees: A Handy Guide for People Who Want to Put Down Roots
- Help...For Landowners Who Want to Branch Out

(Available from the nearest district office of the Ministry of Natural Resources.)

Sample Planting Plan and Stock Requisition

A sample planting plan is attached to assist landowners in planning a successful tree establishment project.

PLANTING PLAN FOR TREE SEEDLINGS

1 Property Owner Name	2 Home Telephone ()
2 Address	4 Business Telephone ()
5 City	6 Postal Code

Location of Property

7 Lot	Conc.	Township	County/Regional Municipality	Total Area Owned (ha)
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9 Planting Objectives:	<input type="checkbox"/> plantation	<input type="checkbox"/> wildlife	<input type="checkbox"/> other
	<input type="checkbox"/> shelterbelt	<input type="checkbox"/> educational	
	<input type="checkbox"/> aesthetics	<input type="checkbox"/> scientific	
10 Please complete map on this application			
11 Hectares to be Planted:		12 Seedlings Required:	
13 Planting Site Information: Previous use of site?			
Soil Type:	Sand <input type="checkbox"/>	Drainage:	Well Drained <input type="checkbox"/>
	Loam <input type="checkbox"/>		Moderately Drained <input type="checkbox"/>
	Fine Loam <input type="checkbox"/>		Imperfectly Drained <input type="checkbox"/>
	Clay <input type="checkbox"/>	Soil Depth:	Shallow <input type="checkbox"/> (< 60 cm or 2 ft)
			Deep <input type="checkbox"/>

14 Method and Timing of Site Preparation for Planting Seedlings		
	Ploughed & Discd <input type="checkbox"/>	Hand Scalped <input type="checkbox"/>
	Chemical Weed Control <input type="checkbox"/>	None <input type="checkbox"/>
	Furrowed <input type="checkbox"/>	
Month and Year of Site Preparation:		
15 Planting:		
Planting Conducted by:	Owner <input type="checkbox"/> , MNR <input type="checkbox"/> , Conservation Authority <input type="checkbox"/> , Other <input type="checkbox"/>	
Planting Technique:	Hand <input type="checkbox"/> , Machine <input type="checkbox"/>	
Spacing Between Trees:	metres	
16 Maintenance/Tending Methods for Planted Seedlings		
17 Seedlings Required Spring of 19 _____		

18 Species	Quantity	Species	Quantity	Species	Quantity

