EXTENSION NOTES

Ontario

PLANNING FOR TREE PLANTING

Whether you wish to plant just a few trees or a large area, planning ahead can make the difference between success and failure. Use the information in this Extension Note as a guide to planning your successful tree planting project.

A series of Extension Notes have been prepared to help you achieve your tree planting goals. Look to the following Extension Notes for advice on the four phases of a successful tree planting project: 1. *Planning for Tree Planting;* 2. *Clearing the Way: Preparing the Site for Tree Planting;* 3. *Careful Handling and Planting of Nursery Stock;* and 4. *Room to Grow: Controlling the Competition.*

ADVANCE PLANNING IS CRUCIAL

There is much to be done before you actually plant your trees. Allow plenty of time by planning your tree planting project one to two years in advance. Here is a sample timetable:

YEAR ONE — SUMMER THROUGH EARLY FALL

- Determine your objectives for planting trees
- Inspect your planting site
- Prepare a planting plan
- If you need help contact your local MNR office. Their extension services staff can give you advice and assistance. They may also suggest additional help from other agencies such as a conservation authority or a Soil and Crop Improvement Association
- Prepare your site for planting
- Control competing vegetation
- Improve drainage if necessary
- Order your trees from MNR or a private nursery

YEAR TWO — LATE WINTER THROUGH EARLY SPRING

- Receive nursery invoice, confirmation of order
- Arrange for equipment, volunteer help or contract tree planters
- Receive your seedlings. Transport and handle with care! (See Extension Note: *Careful Handling and Planting of Nursery Stock*)
- Store your trees properly on site and plant your trees within two days
- Monitor your seedlings and control vegetation if required

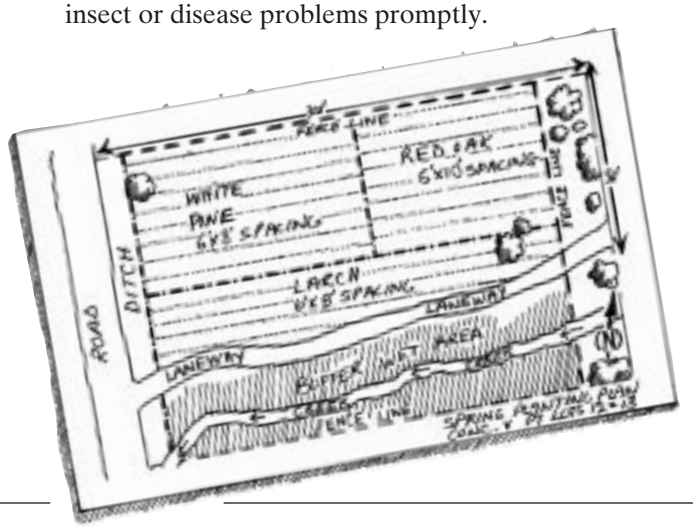
YEAR TWO AND BEYOND

- Inspect your trees regularly. Control vegetation and insect or disease problems promptly.

YOUR PLANTING PLAN

Your planting plan should include:

- a description of your objectives
- a map of the property and a site description
- detailed plans for site preparation
- the number of trees required by species
- planting arrangement and tree spacing
- plans to control unwanted vegetation



YOUR OBJECTIVES

You may want to plant trees to:

- improve the environment
- increase the value of your property
- provide a treed space for recreation
- produce wood products such as lumber or fuel, or specialized crops like Christmas trees or nuts
- prevent soil erosion by wind or water
- provide habitat and food for wildlife
- conserve energy

CHOOSING SPECIES

There are many conifer (needle-bearing) and hardwood (broadleaf) tree and shrub species available through MNR and private nurseries to help you meet your objectives.

- To improve the availability of food for birds and other wildlife, try planting groups of fruit bearing shrubs such as red osier dogwood, highbush cranberry or mountain ash.
- For wildlife cover consider a plantation of cedar, spruce, or pine. These species will provide excellent cover for small animals such as rabbits in less than ten years, and winter cover for larger animals such as white-tailed deer in 30 to 40 years.
- Scots pine, white spruce, and balsam fir can produce a crop of Christmas trees in 7 to 15 years.
- Red pine,white pine, white spruce, and Norway spruce are conifer species suitable for timber production. These species can yield sawlogs from thinning within 40 years but will require 80 to 100 years to achieve maximum size and value.
- Valuable forest products such as veneer logs and sawlogs may also be produced from numerous hardwood species. But hardwoods are much more sensitive than conifers to competition from weeds and grasses. Be prepared to control all weeds before planting and for several years after planting.
- Poplar, cedar, white spruce, and Norway spruce are good choices for windbreaks.

PLANTING ARRANGEMENT

Planting trees in relatively straight, equally spaced rows provides tractor access for mowing, spraying or other operations. Allow a minimum of 2.4 m (8 ft) between rows.

If you do not like the appearance of rows, and are not concerned about access between trees, give your plantation a more natural appearance by planting your trees in a random pattern, keeping the same general spaces between the trees.

SPECIES MIXTURES

Trees of different species seldom grow at the same rate on the same site. Often one species will outgrow and eventually eliminate the other. If you wish to plant a mixture of species, plant each species in approximate squares or circles of no less than 20 trees. This will ensure that some trees in the centre of each cluster will not be overgrown by faster growing neighbors.

SPACING

If forest products are your primary objective, spacing and arrangement are critical to maximizing growth and yield of your trees. For example, you may wish to establish sugar maples in an orchard for the production of maple syrup. Such an orchard should be planted with 10 m (30 ft) between trees to encourage the development of deep, large crowns essential for maximum sap production. If you wish to grow balsam fir for Christmas trees you can maximize the number of trees you can plant on your site by planting them 1.8 m (6 ft) apart.

Plant conifers for sawlog and pulp production in rows that are a minimum of 2.4 m (8 ft) apart. The trees should be planted within the row at 1.8 m (6 ft) spacing. This will result in a plantation of 2,300 trees per hectare (900 trees per acre). Hardwoods should be planted in rows 3 m (10 ft) apart, but with only 1.5 m (5 ft) between trees. This will result in 2,000 trees per hectare (880 trees per acre).

PLANTING SITE DESCRIPTION

MAKE A MAP

The best way to appreciate the site conditions is by making a thorough inspection of your planting site. A good first step is to prepare a sketch of your site. On the sketch, indicate the orientation of the site using a north arrow. Also show the location of the access routes, buildings and any relevant boundaries such as fences or edges of woodlots. Power line corridors and other areas which should not be planted should also be shown on your map. Note the lay of the land. Show any steep slopes or other obstacles that may be a problem for equipment.

You should estimate the total area to be planted to determine the total number of trees you will require. Roughly square or rectangular sites can be measured using a long measuring tape or a rope of known length.

SOIL CHARACTERISTICS

Each tree species is adapted to a specific range of site conditions. To choose the appropriate species for your planting site you should be aware of the soil texture and drainage. Use the chart on the back page to help you match tree species to your soil conditions.

To inspect your soil, use a shovel and sample the soil at different locations across your planting site. Take a handful of soil, free of roots and debris, at each location. First feel the dry soil with your fingers, then moisten it and try to squeeze it into a ball in your fist. A sandy soil will feel grainy and will not hold together even when moistened and clenched in your fist. Loamy soil will feel like grainy flour when dry and when moist will hold together if handled carefully. Clay soil is made up of very fine soil particles which will hold together well. A dry clay soil will be hard to dig and come out as hard clods.

Imperfectly-drained soils will be saturated within 30 cm (1 ft) of the surface for at least part of the year. These soils remain spongy for some time in the spring or after a significant rainfall. Well drained sites dry out rapidly at any time of the year.

Trees cannot be successfully planted everywhere. Extremely shallow soils over bedrock are very susceptible to drought, depriving trees of essential moisture. Soils that are flooded for prolonged periods deprive tree roots of oxygen. Avoid sites with less than 30 cm (1 ft) of soil over bedrock or sites where the year-round water table is very close to the surface.

HOW TO CALCULATE THE NUMBER OF TREES REQUIRED

To determine the number of trees you need for your planting site use the following simple equation:

METRIC

$$\text{total number of trees} = \text{total planting area (hectares)} \times \frac{10{,}000}{\text{spacing between rows (metres)} \times \text{spacing between trees (metres)}}$$

IMPERIAL

$$\text{total number of trees} = \text{total planting area (acres)} \times \frac{43{,}560}{\text{spacing between rows (feet)} \times \text{spacing between trees (feet)}}$$

PRESENT VEGETATION

While inspecting the soil conditions on your site, also take note of the vegetation growing there. Take note of grasses, broadleaf weeds and woody shrubs that will compete with your trees for moisture, nutrients, light and space. Too much competition will reduce the growth of your seedlings or even cause them to die. Tall grass and weeds, weighted down by snow, can crush young seedlings. Thick vegetation is also ideal habitat for rodents that will feed on the bark of your seedlings during winter months.

SITE PREPARATION

Like vegetables in your garden, tree seedlings will benefit from the removal of competing weeds and preparation of the soil prior to planting. Refer to the Extension Note: *Clearing the Way: Preparing the Site for Planting* for help in planning appropriate site preparation for your site.

YOUR RESOURCES

It cannot be overemphasized that it is a big job to prepare a site for planting, plant the trees and then care for them during the critical early years. If you intend to do everything yourself or with the help of friends, be prepared to set aside the time.

Consider scheduling large planting projects over a number of years. The time required for site preparation will depend on the size of the area and the type of operations. Do not be tempted to take shortcuts in preparing the site. Good site preparation will reward you with better initial survival and growth, and save you time in the long run by reducing the vegetation control required after planting.

At planting time, you should count on planting 400 trees per person in an eight-hour day if you and your helpers are not experienced. If you hire experienced planters you will find they can usually plant 1,000 trees per day or more. If you have a dry and relatively stone-free site you can plant several thousand trees per day by using a tractor and tree planting machine. Many MNR offices and some conservation authorities will rent you a planting machine for a reasonable fee.

You are not finished after putting the trees in the ground. You should be prepared to inspect the plantation several times per season to check for weed and insect problems. In addition, you may have to spend some time controlling weeds around your new trees in order to ensure their survival.

EQUIPMENT

Tree planting equipment is relatively inexpensive and easy to acquire. Round or square gardening spades are fine if you are planting just a few trees, but consider buying good tree planting shovels for large projects. These shovels are designed to make tree planting easier. Other things to have on hand are a tarp to cover your trees and plenty of sturdy buckets to carry your trees in as you plant.

If you have access to a tractor and some basic farm implements, and you have the skills to use them, you are in a good position to do your own site preparation. If you plan to control weeds after planting by mowing or cultivating, remember to plant your trees in rows that are far enough apart for your tractor.

A GUIDE TO MATCHING SPECIES TO SOIL

soil texture	natural drainage	
	well to moderate	imperfect to poor
sand	white pine red pine European larch Norway spruce sugar maple red oak white cedar poplar black locust	white cedar tamarack black spruce green ash willow
loam	white pine red pine white spruce black spruce Norway spruce European larch white cedar sugar maple red maple white ash green ash red oak black cherry beech basswood black walnut bitternut hickory poplar black locust	white cedar tamarack black spruce silver maple red maple willow
clay	white pine Norway spruce European larch white cedar white ash black locust green ash beech red maple black walnut poplar	tamarack black spruce silver maple green ash willow

If you lack the equipment, skills, or time to do your own work a good alternative is to seek the help of a neighboring farmer. There are also custom farm and forestry contractors available for hire to supply you with site preparation, planting and tending services. Your local MNR office can supply you with the names of suitable contractors in your area.

Your time and effort in advance planning and preparation will give your planting project the best chance for success. Your reward will be a lifetime of enjoyment and benefits from your trees. Practical advice and assistance on tree planting, site preparation and tending is available through your local office of the Ontario Ministry of Natural Resources.

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