

EXTENSION NOTES



EASTERN WHITE PINE

The eastern white pine has great economic, historical and cultural significance to Canadians. Commonly known as white pine, this species was the basis of Ontario's early forest industry.

This extension note provides information on identifying and growing white pine trees.

INTRODUCTION

Eastern white pine was named Ontario's official tree in 1984. The tree's beautiful silhouette was made famous by members of the Group of Seven artists.

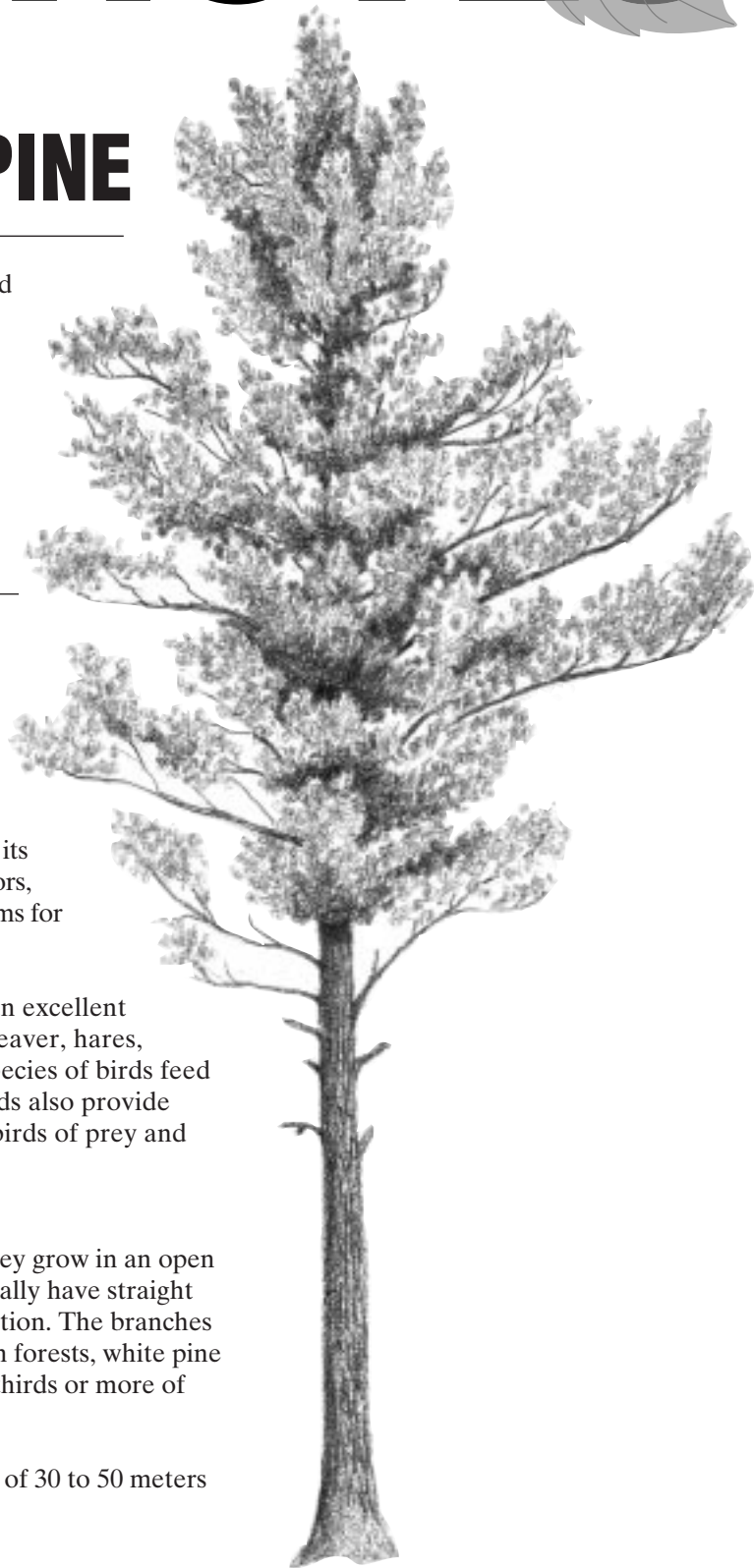
Its soft, pale wood and tremendous size established its value early in Canadian history for products ranging from furniture to ship masts. Today, white pine is considered the most valuable softwood lumber because of its uniform grain. It's used for window sashes and frames, doors, mouldings, trim, siding, panelling, cabinet work and in forms for metal foundry work.

One of the more rapid growing conifers, white pine is an excellent tree for reforestation. It is also important to wildlife. Beaver, hares, rabbits, porcupines, squirrels, mice, deer and several species of birds feed on white pine seeds, bark and needles. White pine stands also provide shelter for moose, bear, grouse, woodcock, songbirds, birds of prey and small mammals.

TREE SHAPE

The shape of eastern white pines depends on whether they grow in an open field or in a sheltering stand. In the open, white pine usually have straight uniform trunks with wide branches along the middle portion. The branches near the tops curve upwards, creating oval silhouettes. In forests, white pine trunks are usually straight and free of branches for two-thirds or more of their height.

White pine can live to be 450 years old, reaching heights of 30 to 50 meters and diameters of one to 1.5 meters.



HOW TO IDENTIFY WHITE PINE

NEEDLES

White pine needles are six to 12 centimetres long and clustered in groups of five. The needles are straight, flexible, soft to touch, dark blue-green in color with finely toothed edges. They stay on trees for two or three years before turning brown and falling off in the autumn.

TWIGS

The twigs of young trees are green and covered with velvety hairs. As trees mature, twigs lose their hairs and turn orange-brown.

BUDS

White pine buds are slender and about 1.5 centimetres long. They are sharply pointed with overlapping red-brown scales.

BARK

On young trees the bark is grey-green, changing to a dark grey-brown as they age. Mature bark has deeply furrowed vertical ridges 2.5 to five centimetres wide.

CONES

White pine cones hang singly or in groups from branches near the tops of trees. They have 50 to 80 scales, usually found in spiralling rows of five. Cones are cylindrical when closed.

They are six to 20 centimetres long and about 2.5 centimetres wide. Soon after the cones mature, they open and release winged seeds.



White pine needles are clustered in groups of five.



Immature white pine cone.



Mature white pine cone.

WHERE WHITE PINE GROWS BEST

Eastern white pine is the tallest conifer in eastern Canada. It is found in the Great Lakes/St. Lawrence Forest Region and extends into the Boreal, Acadian and Deciduous Forest regions.

SOIL

White pines are well suited to poorer soils and drier sites, but grow best on moist sandy or loamy soils.

SHADE OR SUNLIGHT?

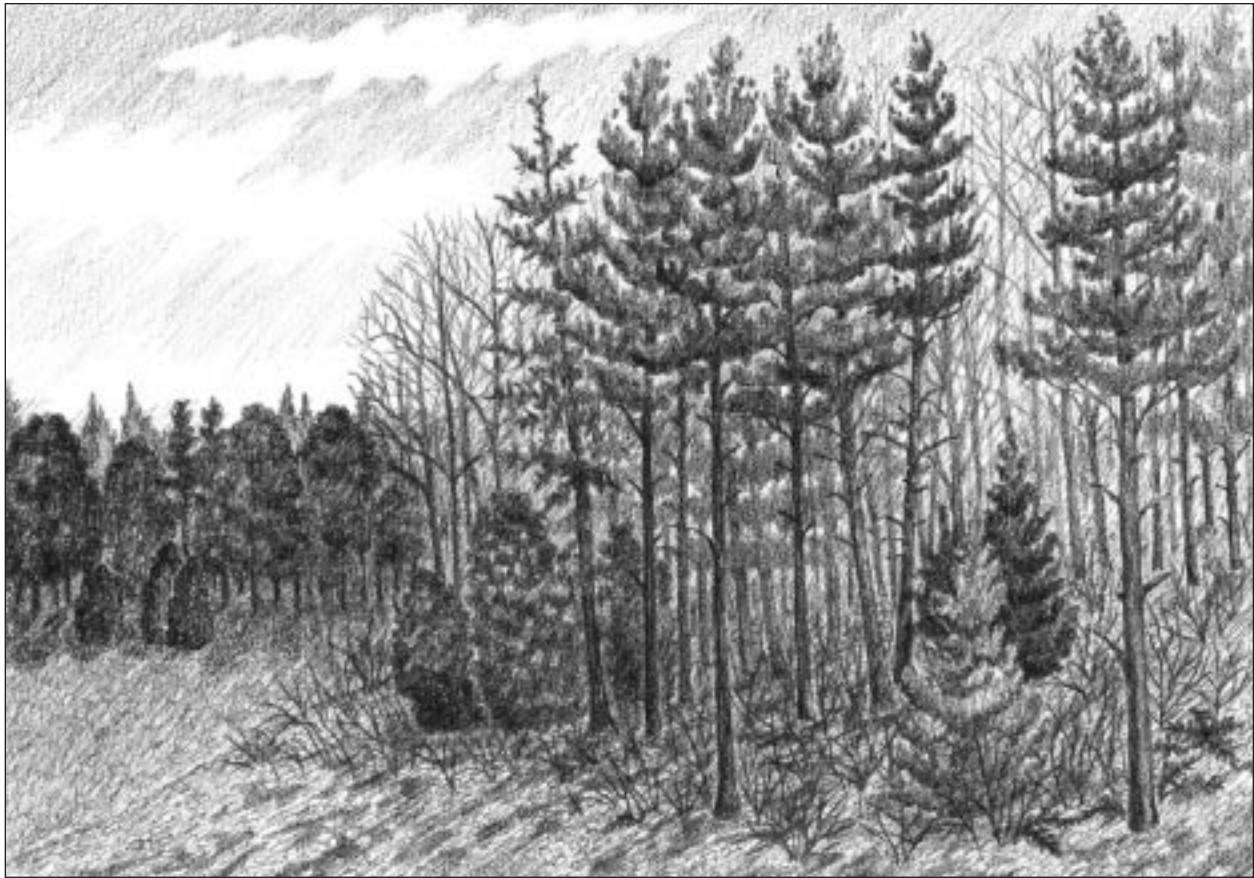
White pines are moderately tolerant of shade. As seedlings they can survive in shade but require partial to full sunlight to thrive after they are established.

STAND COMPOSITION

White pines grow in pure and mixed stands with other conifers and hardwoods. They are most commonly found with red oak, white ash, hemlock, chestnuts, maples and beech. They are also found with jack pine, red pine, white spruce, yellow birch, white birch, aspens, black cherry, black oak, white oak and hickories. White pine is a component of mature forests throughout its range. It is known as a pioneer species because it is often one of the first trees to grow on a barren site.

STAND LOCATION

White pine grows well on a range of slopes.



Eastern white pine grows on a variety of sites with many other tree species. It often grows naturally in old fields along with other pioneer species, such as aspen and white birch.

HOW TO GROW AND CARE FOR WHITE PINE

How you manage your white pine stand depends on your goals. For example, stands can be managed for timber production, windbreaks or landscaping. Managing to achieve these goals also provides other benefits, such as improved wildlife habitat and cleaner air and water.

Whatever your goals, a forest management plan for your property can help you achieve them. Assistance with preparing a plan is available from independent forestry consultants and the Ministry of Natural Resources.

CREATING A NEW WHITE PINE PLANTATION

Before white pine seedlings are planted, the site needs to be mechanically disturbed to turn up fresh soil, burned or treated with herbicide. This rids the site of plants that might compete with seedlings for sunlight, water and nutrients. After the seedlings are planted, they need to be protected from competition with other plants until they are established.

Site selection and the distance between plants are important factors in the success of a plantation. Heavy clay soils, poorly drained bottom land and upland depressions should be avoided. As a general rule, there should be two metres between seedlings.

MANAGING AN EXISTING STAND

White pine is moderately tolerant of shade and grows best in stands of similarly aged trees or other situations with limited shade. In the seedling stage, white pine is susceptible to competition because its growth in height is slow compared to most other species. If white pine survives to the sapling stage, its ability to compete is greatly improved.

REGENERATING WHITE PINE NATURALLY

White pine can be naturally regenerated by several methods, including clear cutting, seed tree and shelterwood. (These methods are discussed later in this extension note.) The uniform shelterwood and the seed tree methods are particularly useful for growing white pine.

If there is abundant natural reproduction of white pine in a stand, opening up the forest canopy to allow more sunlight to reach the seedlings is often all that is needed to help white pine grow.

TIMBER PRODUCTION

Managed stands of white pine can produce high quality sawlogs, veneer and pulpwood. The goal is to produce trees with long, straight, branch-free stems, which are highly valued for wood products.

To encourage trees to compete for light and grow tall, rather than to branch at lower levels, stands of white pine should be thinned and pruned every 10 to 15 years as the trees grow to marketable size. Care should be taken not to open the stand too rapidly because white pine are susceptible to ice damage.

WHITE PINE HEALTH

Good management practices can help to mitigate the many environmental and biological stresses that affect the health of white pine trees. To protect their trees, woodlot owners should ensure their actions do not combine with other factors to weaken trees. Careful consideration should be given to cutting, pruning or other activities when trees are stressed by insect outbreaks or severe weather. They should also monitor the health of the forests in their area and watch for insect pests in their stands.

ENVIRONMENTAL STRESSES

- drought
- fire
- frost or ice damage
- lightning damage

BIOLOGICAL STRESSES

- competition with other plants
- disease
- insect pests

STRESSES CAUSED BY POOR MANAGEMENT

- livestock grazing
- poor pruning and thinning practices
- damage to stems caused by logging or recreational use

CONTROLLING LIVESTOCK GRAZING

Livestock should not be allowed to graze in woodlots if the woodlot is being managed for commercial timber. Livestock trample the roots of mature trees and compact forest soil. Livestock browsing results in the



Pruning is important when growing white pine for wood products. Removal of a tree's lower branches helps to produce a tree with long, branch-free stems. If the pruned branches are removed from the site, pruning also reduces the incidence of white pine blister rust by improving the air flow and reducing the potential of fire.

introduction of species that have a low commercial value, such as prickly ash, ironwood and hawthorn.

CONTROLLING INSECT PESTS AND DISEASE

Insect and disease management procedures should be incorporated into all phases of woodlot operations, including planting, maintenance and harvesting.

Management of understorey vegetation is the most important step in reducing pest damage. It can also reduce the effects of mice, hare and deer, which feed on seedlings.

Site selection is an important factor in preventing damage by insects and disease. Many of these biological stresses are most damaging to trees growing on poor sites

FOREST MANAGEMENT SYSTEMS FOR WHITE PINE

| | METHOD | RESULTS |
|----------------------------|---|--|
| Uniform Shelterwood | A mature forest stand is gradually harvested in several separate cuts to allow mature trees to seed cleared areas. It is the preferred method for growing white pine on shallow sites. | <ul style="list-style-type: none">• Even-aged stands• Provides the best seed sources and protection from competition with species that tolerate shade• Long time between harvests |
| Strip Shelterwood | A series of strips, up to 40 metres wide, are cut in a mature forest. To prevent wind damage, this method is used only when the topography permits the strips to be cut at right angles to the prevailing wind. | <ul style="list-style-type: none">• Uneven-aged stands• Favors species that tolerate shade, rather than white pine• Can be visually unattractive until new growth develops |
| Seed Tree | Most of the trees in an area are harvested in one cut. Seed trees are carefully selected and left to grow throughout the cleared area to seed it naturally. When new growth is established, seed trees are removed. | <ul style="list-style-type: none">• Even-aged stands• Maintains white pine as a component of a mixed forest• Can be visually unattractive• Long time between harvests |
| Clear Cutting | All the trees in an area are cut at the same time. The area is regenerated naturally by releasing existing seedlings or artificially by seeding or planting. | <ul style="list-style-type: none">• Even-aged stands• Mixture of shade tolerant and intolerant species• Visually unattractive• Expensive to regenerate by planting or seeding |

FURTHER READING

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COMMON WHITE PINE INSECT PESTS AND DISEASES

White pine weevil

(Pissodes strobi)

Description

- brown, snouted beetle with irregular patches of white scales
- the vertical leading shoot withers, bends and turns brown in July
- trees develop crooked or forked stems and lose at least two years' growth

Control

- remove and burn infested terminal shoots in June or July
- avoid planting on sites with southerly aspect because larvae feed in bright sunlight, or provide some shade until trees are six metres tall

White pine blister rust

(Cronartium ribicola)

- brown clusters of needles, swellings on branches or large resinous wounds on trunks, with white blisters containing powdery orange masses of spores in May
- highly virulent, attacks trees from seedling stage to maturity
- kills branches and eventually entire trees

- cut off diseased branches at the trunk

Root rot

(Fomes annosus)

- a fungal infection located at the base of living trees or infected stumps
- produces spores that infect other trees when released into the air
- infection causes needles to turn yellow, stunted growth and death

- cover exposed stump surfaces with dry Borax powder
- clear cut heavily infested areas

European pine sawfly

(Neodiprion sertifer)

- green larvae with dark stripes on body and black head
- adults resemble small bees
- feeds in colonies from May to June on old needles and bark of new shoots
- stunts tree growth

- remove larvae by hand if only a few trees are affected
- apply insecticides to larger infestations

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