

EXTENSION NOTES



POPLARS

Poplars are an important crop for many woodlot owners and farmers. They provide timber, pulp for paper-making and wildlife habitat. This Extension Note provides information on the four poplar species in Ontario: balsam poplar, largetooth aspen, trembling aspen and eastern cottonwood.

HOW WE USE POPLARS

Fast-growing and easy to regenerate, poplar is an important commercial product. These qualities also make it useful for windbreaks and for controlling erosion. The soft, lightweight wood makes great pulp for paper products. Because the wood resists splitting, it is used to make childrens' playground structures, boxes, crates, plywood and veneer for fruit baskets. It is also used for composite lumber products, particle board, landscape lumber and fuelwood.

HABITAT FOR WILDLIFE

Poplars are an important food for beavers, white-tailed deer, ruffed grouse and many other bird species. Beavers also use poplars to construct dams and lodges. Poplars provide summer shelter for deer and are the preferred nesting sites of northern flickers and chickadees.

COLONIZERS OF OPEN SPACES

Poplars are shade intolerant, which means they need full sunlight to grow. In shade, they quickly lose the competition with other species and die. Poplars rely on fire, logging or other major disturbances to open up the forest canopy and give them the room and sunlight they need to grow. They are one of the first trees to grow in open areas. As they mature, they create the shaded conditions other species need to grow.



Hybrid poplar serve as windbreaks along roads.

GROWING AND CARING FOR POPLARS

How you manage poplars depends on your goals. Poplars can be grown for wood products, for borders along streambeds to stop erosion and increase water quality, for wildlife habitat and as landscaping. 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 Ontario Ministry of Natural Resources.

CHOOSING A SITE

Poplars grow best in moist, well-drained areas. They prefer soils with a pH above 6.9 and a texture ranging from loam to clay loam.

HARVESTING

Clearcutting creates the conditions poplars need to regenerate naturally. Depending on the site, you might harvest with patch cuts or strip cuts, while taking measures to protect wildlife dens, shorelines and slopes. The whole-tree method, which removes the entire tree, is recommended because it leaves little debris on the site. Fine branches and other debris are often put through a roadside chipper and used for pulp.

REGENERATING POPLARS

Poplars are easy and inexpensive to reproduce. When mature poplars are harvested through clearcutting, a dense carpet of new shoots called coppice growth or suckers sprouts from the roots near the soil surface. The poplar suckers grow rapidly into a new forest. In fact, they can reach pulpwood size in 20 to 30 years.

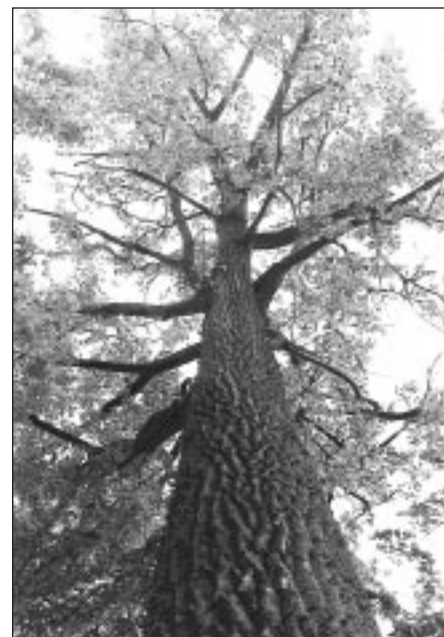
KEEPING POPLARS HEALTHY

Many insects and diseases affect the health of poplars. Pests include the poplar petiolegall aphid, poplar sawfly and poplar vagabond aphid. Diseases include fomes root rot fungi, hypoxylon canker, septoria leaf spot, nectria canker, powdery mildew and shoot blight of aspen.

You can protect the health of poplar stands by ensuring that your actions do not combine with other factors to weaken trees. Monitor the health of the forests in your area and watch for insect pests in your stands. Avoid cutting, pruning or other activities when your trees are stressed by insect outbreaks, severe weather or other factors.



Trembling aspen stands are harvested for pulpwood using the clearcut silvicultural system.



Eastern cottonwoods grow to be giant trees in southern Ontario woodlands.

WATCH FOR THESE COMMON PESTS

FOREST TENT CATERPILLAR

This insect larvae feeds on the leaves in May and June. Mature larvae are 50 millimetres long, hairy and brownish, with a blue stripe along each side and a row of keyhole-shaped white spots along the back. Adults are buff-brown moths with three dark bands across each forewing. The moths lay eggs in bands of 100 or more that completely encircle twigs.

Outbreaks occur every 10 to 12 years. Watch for the eggs in winter. Protect individual trees by removing and burning the egg clusters.

GYPSY MOTH

This insect larvae climbs to the tree top, eating leaves along the way. Mature larvae are 50-millimetre-long caterpillars. Dark-colored and hairy, they have a double row of five pairs of blue spots down the back. Male moths are light-brown, with a slender body. Females are grey, with a heavy body — they can't fly. The moths lay eggs in masses of 100 or more. The eggs are covered with a matt of buff-colored hairs and hatch in the spring.

Protect individual trees by removing and burning egg masses.

WATCH FOR THESE COMMON DISEASES

HYPOXYLON CANKER

This canker disease occurs on most poplars, but it is most common on trembling aspen. The disease affects the trunk of trees, and it appears as a long narrow wound up to one metre long. Near the edges of the wound, the bark appears yellowish to orange in color. The disease may continue for several years until the trunk is girdled by the canker and the upper parts of the tree dies.

Hypoxylon canker is mainly a disease of forest trees, but it is sometimes encountered on shade trees. In these instances, remove trees that show signs of the canker.

MELAMPSORA LEAF RUST

This disease becomes more severe through the growing season and can result in decreased growth and vigor. Heavy attacks can delay the hardening-off of the shoots, making the trees susceptible to fall frosts and other diseases. The disease requires two different host species to complete its life cycle — poplar and an alternate conifer host. Larch is the most common alternate host. The first signs of the rust appear in early summer when small, raised, powdery, yellow-orange spots develop on the underside of the leaves. Heavily infected trees can lose all of their leaves.

The timing of the first infection is important because the degree of damage increases with time. Trees attacked late in the season suffer little damage or growth loss.



Eastern cottonwood is a hardy tree that grows well in exposed areas.

HOW TO IDENTIFY POPLARS

The four species described here are most easily distinguished by the shape and edges of their leaves. In addition to these species and other exotic species of poplars, you might encounter poplars that don't fit a description, especially in towns and cities. That's because different species of poplars can interbreed to form hybrids with varying characteristics.

BALSAM POPLAR

Tree Shape

Mature balsam poplars have long, straight trunks and narrow, irregular crowns. They have a few large limbs, with branches that curve upward. These short-lived trees reach heights of 30 metres and diameters of 1.3 metres.

Leaves

The leaves are oval or egg shaped, tapering to a sharp point. Fine, rounded teeth line the edge. The leaves are 7.5 to 12.5 centimetres in length. The tops are smooth and shiny dark-green. The underside of the leaf is a silvery whitish-green with rust-colored blotches and an obvious network of veins.

Twigs

Twigs are clear reddish-brown, with bright-orange spots on the bark of young branchlets.

Buds

The 2.5-centimetre-long end-buds are tapered and pointy. They are covered by five scales. The buds produce a resin and are very fragrant.

Bark

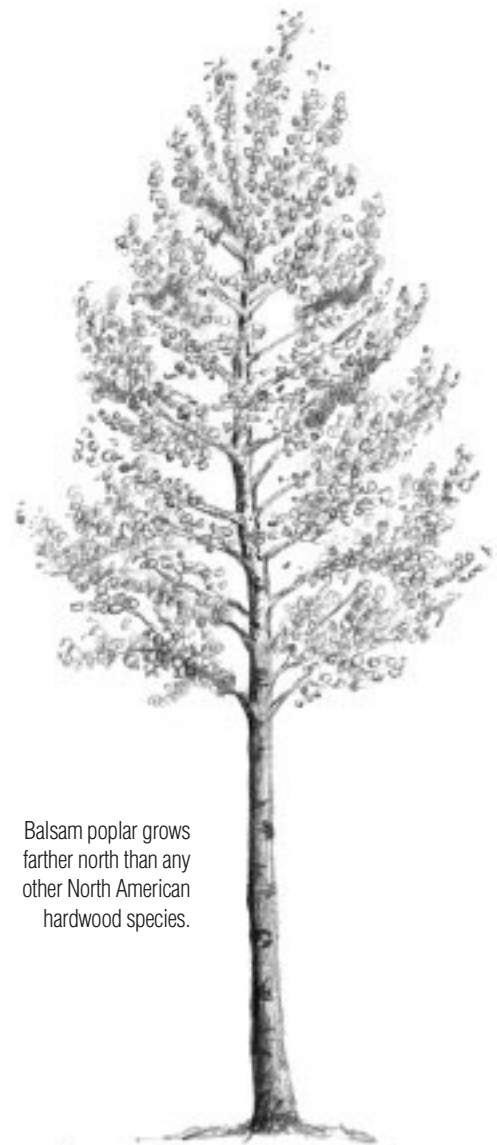
On young trees, the bark is smooth and greenish-brown. Mature trees have dark-grey bark with deep, flat-topped ridges.

Fruit

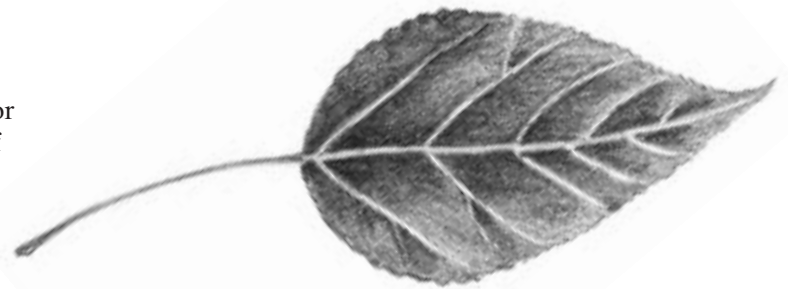
The fruits are egg-shaped pods about 0.6 centimetres in length. They contain cottony seeds that mature in May or June. The seeds are pear shaped. Each seed has a tuft of long silky hair.

Favored Sites and Growing Conditions

In Ontario, balsam poplars are found throughout the Boreal, Great Lakes-St. Lawrence and Deciduous forest regions. They grow on all but the wettest of soils, and are rarely found on dry, exposed sites. This species prefers moist, rich and low-lying sites. Extremely intolerant of shade, it doesn't compete well unless it is the dominant



Balsam poplar grows farther north than any other North American hardwood species.



species on a site. Balsam poplars are often found with alders, willows, balsam firs, black spruces, white spruces and white birches.

LARGETOOTH ASPEN

Tree Shape

The trunks can extend over two-thirds of a tree's height. The crowns are uneven and egg-shaped, with a few rough branches. On good sites, largetooth aspens can reach heights of 30 metres and diameters of 90 centimetres. They are usually 20 to 25 metres tall and 45 to 60 centimetres in diameter.

Leaves

Leaves vary from oval to round and end in sharp, pointed tips. They are five to 10 centimetres in length, with deeply toothed edges and dark-green upper-surfaces. The undersides are downy in the spring as they unfold. Later, they change to pale-green.

Twigs

The twigs are stout and dull brownish-grey. They are often hairy.

Buds

The end-buds are about one centimetre long and covered with a dull, dusty wool.

Bark

The bark on young trees is smooth, ranging from pale-green to yellowish-grey. Mature trees have deeply furrowed, dark-grey bark.

Fruit

Largetooth aspen fruits mature by the time the leaves are fully grown. The small, downy, narrow cone-shaped pods are about 0.5 centimetres in length. They split into two parts to release tiny seeds with long white hairs.

Favored Sites and Growing Conditions

In Ontario, largetooth aspens are found in the Great Lakes-St. Lawrence and Deciduous forest regions. They grow best in moist, fertile, sandy soil. When growing on dry, sandy or gravelly soils, largetooth aspens are often small and scrubby. This species prefers sunny, south-facing slopes. Largetooth aspens are intolerant of shade and eventually die when competing with other species in mixed stands.



Largetooth aspens can be identified by the large teeth along the edges of the leaves.



TREMBLING ASPEN

Tree Shape

Trembling aspens have long, smooth, branch-free trunks that end in short, rounded crowns. They are usually 12 to 18 metres in height and 20 to 25 centimetres in diameter.

Leaves

Trembling aspen leaves are the smallest of the four species, measuring 3.5 to five centimetres in length. They are nearly round and have sharp tips and finely toothed edges. The leaves are dark-green above and pale-green underneath. Because the leaf-stems are flattened and longer than the leaf-blades, the leaves tremble, even in a light breeze.

Twigs

The twigs are slender, round and shiny brownish-grey.

Buds

End-buds are 0.6 centimetres in length, sharply pointed, slender and reddish-brown. They have little resin and fragrance.

Bark

Young trees have smooth, waxy and light-colored bark. At a distance, they can be mistaken for white birch. The bark of older trees is grey and furrowed with long, flat ridges.

Fruit

The small, hairless, narrow cone-shaped pods are about 0.5 centimetres in length and crowded together on slender, flexible stems. They split into two parts to release tiny seeds with long, white hairs.

Favored Sites and Growing Conditions

Trembling aspens are found throughout Ontario in almost all soil types. They grow best on well-drained, moist, loamy soils that are rich in organic matter. Young trees grow in pure stands in many areas. However, they are extremely intolerant of shade and usually succeed to more shade-tolerant coniferous and deciduous species. When growing in mixed stands, trembling aspens are found with white spruces, black spruces, balsam firs, white birches, balsam poplars and jack pines.



Trembling aspen is the most widely distributed tree species in North America.



EASTERN COTTONWOOD

Tree Shape

When growing in open areas, eastern cottonwoods have short trunks that divide into a few large, wide-spreading branches. In forests, they have long, straight trunks that lead to small, rounded crowns. One of the larger poplars, they reach heights of 23 to 30 metres and diameters of 70 to 130 centimetres.

Leaves

The leaves are triangular and between five and 10 centimetres long. They end in a sharp, toothless tip. The leaves are a bright, shiny-green above and a pale-green below. Coarse teeth line the edges.

Twigs

Twigs are stocky, smooth and yellowish-brown.

Buds

The end-bud is about two centimetres long, slender, pointed and hairless. It produces a small amount of resin.

Bark

The bark of young trees is smooth and yellowish-grey. Mature trees develop thick, coarse dark-grey bark with deep furrows.

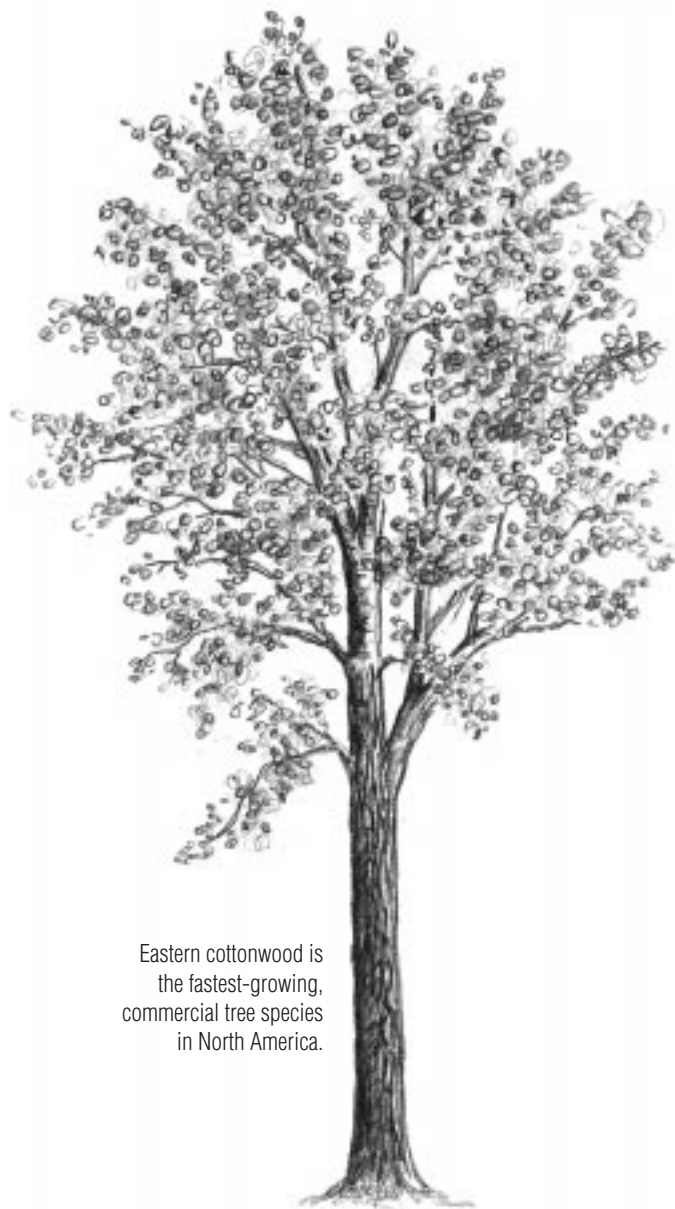
Fruit

The fruits are oval pods about 0.5 centimetres in length. They taper at both ends and split into three or four parts to release the seeds.

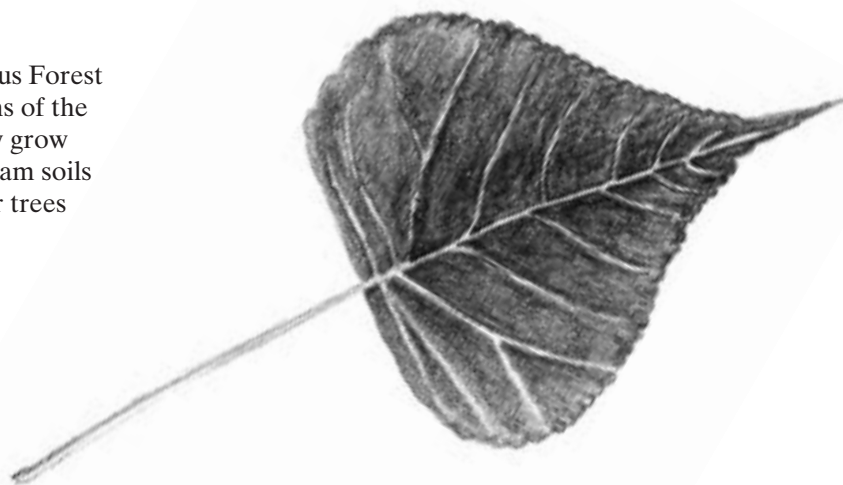
As implied by its name, female cottonwood trees release a vast amount of cottony seeds every spring. Because of this, some communities have restricted the planting of female eastern cottonwood trees. The eastern cottonwood is a picturesque giant best admired where the negative effects of the cotton does not cause a problem.

Favored Sites and Growing Conditions

Eastern cottonwoods are found in the Deciduous Forest Region and in the southern and eastern portions of the Great Lakes-St. Lawrence Forest Region. They grow best in moist, well-drained fine sandy or silty loam soils that are close to streams. Pure stands of smaller trees often grow along stream banks.



Eastern cottonwood is the fastest-growing, commercial tree species in North America.



HYBRID POPLAR

WHAT IS HYBRID POPLAR?

A hybrid is produced by crossing two parents of different species, for example, an eastern cottonwood female tree with a European black cottonwood male tree.

Some of the seedlings produced from such a cross will perform substantially better than the average individual performance of the two parents, in traits which are of interest to the hybrid poplar grower such as high yield, disease resistance and branching habit. Once the seedlings which exhibit the desired traits have been selected, they can be propagated as clones.

THE ORIGIN OF HYBRID POPLAR

Poplar culture has had a long history in Europe. Early French explorers visiting the North American continent returned to Europe with plant specimens, including eastern cottonwood. Fast growing hybrids occurred naturally as the imported eastern cottonwoods crossed with the native European black poplar.

The first artificial hybrid was produced in 1912 in England and since then European countries have been very active in breeding and selecting clones. Poplar cultivation in monoclonal blocks was introduced in the late 1940s after the second World War when wood shortages were severe throughout Europe.

HYBRID POPLAR IN ONTARIO

Some of the European cultivars of hybrid poplar were later introduced to North America. The earliest plantings in Ontario (1925) were with one clone, Carolina poplar, a natural hybrid originally selected in France. Carolina poplar has been used extensively for windbreaks.

Another clone, Lombardy poplar, was planted as a landscape tree because of its tall narrow crown. This clone is seriously affected by a foreign fungal disease — European poplar canker, that kills the tree in three to four years. The preferred way to deal with the problem is to avoid planting this variety of tree.

The first commercial plantations of hybrid poplar were established in the mid-1970s as part of a pilot project. Presently, a limited number of clones, including DN 74 (Stormont) and NM 6 (Williamsburg) are planted.

Today, hybrids are used extensively for stream bank rehabilitation, windbreaks and shelterbelts. The ability of poplar to resprout after cutting also allows the harvesting for commercial and personal wood use, without compromising the environmental benefits of the original planting.

Further Reading

- Hosie, R.C. 1990. *Native Trees of Canada*. Eighth Edition. Fitzhenry & Whiteside and the Ministry of Supply and Services, Canada.
- Ontario Ministry of Natural Resources. 1989. *Common Pests of Trees in Ontario*. Queen's Printer. Toronto, Ontario. pp 64.
- Ontario Ministry of Natural Resources. 1991. *A Grower's Guide to Hybrid Poplar*. Queen's Printer. Toronto, Ontario. pp 148.



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