

EXTENSION NOTES



BUTTERNUT

Butternut is a member of the walnut family and an important source of nuts and wood. It's in danger of disappearing because of a fungal disease called the butternut canker. This Extension Note provides information on identifying butternut trees and growing butternut trees from seeds. For information on the butternut canker, see the brochure *A Landowner's Guide to Butternut Canker in Ontario*.

THE USES OF BUTTERNUT

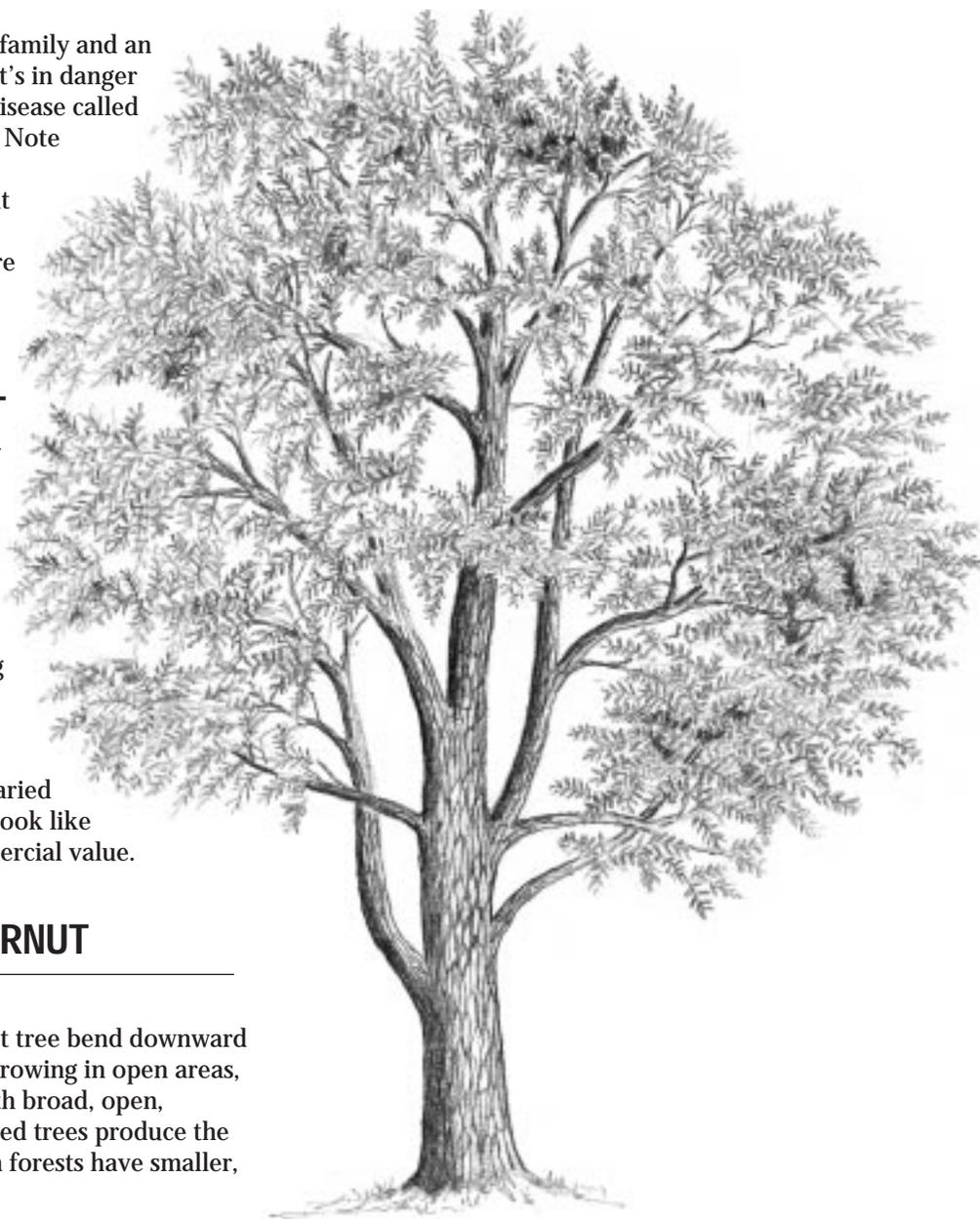
Butternut trees produce a delicious and nutritious nut with a high oil content. The nuts are an important source of food for birds, squirrels, rabbits and other small mammals. Aboriginal people used the nut oil for cooking, hair dressing, leather-making and polishing tools and ornaments.

Carvers and furniture-makers value butternut wood for its softness and varied texture. The wood can be stained to look like black walnut, which has a high commercial value.

HOW TO IDENTIFY BUTTERNUT

TREE SHAPE

The smaller branches of the butternut tree bend downward and turn upward at the ends. When growing in open areas, butternut trees have short trunks, with broad, open, spreading crowns. These large-crowned trees produce the most nuts. Butternut trees growing in forests have smaller, more compact crowns.



TREE SIZE

Butternuts are small to medium-sized trees. Mature trees are seldom more than 21 metres in height and 90 centimetres in diameter. Compared to other tree species, butternuts are short-lived. They rarely live longer than 75 years.

LEAVES

Butternut leaves are yellowish-green, compound and fuzzy on the underside. They are 30 to 60 centimetres long. Each leaf is made of about 11 to 17 leaflets. The nine- to 15-centimetre-long leaflets lie opposite each other along a central stalk.

HOW TO TELL A BUTTERNUT FROM A BLACK WALNUT

You can tell a butternut from its close relative, the black walnut, by looking at the nuts, bark and twigs.

	Butternut	Black Walnut
Fruit	oval	round
Bark	grey	dark brown
Twig	dark-brown pith hairy fringe on leaf scars	light-brown pith no fringe on leaf scars

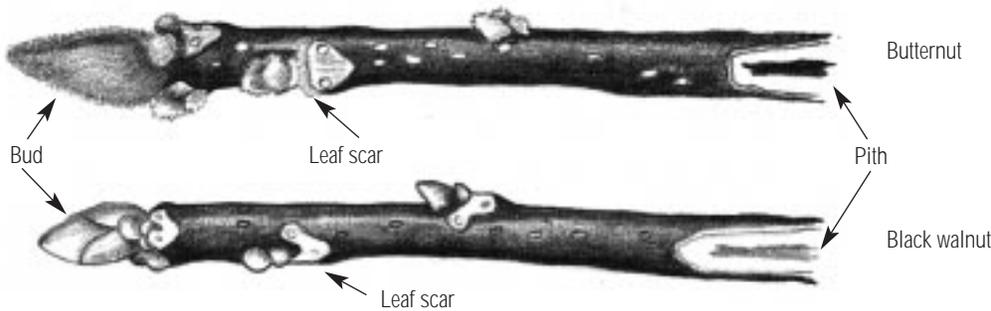


TWIGS

Butternut twigs are buff-colored and covered with a dense carpet of hairs. The centre of the twig, called the pith, is dark brown and filled with chambers. A hairy fringe, resembling a moustache, lies above each leaf scar (the scar that remains on a twig after the leaf has fallen off).

BUDS

The buds are blunt, tan-colored and hairy. There are two buds above each leaf scar. One is a leaf bud, which becomes a leaf in the spring. The other is a flower bud. The leaf and flower buds are arranged alternately along the twig (not directly opposite each other). There is a large terminal bud at the end of the twig.



NUTS

The fruit or seed of the butternut is an oval nut with pointed ends. It is encased in a sticky, hairy, yellowish-green husk. If you peel off the husk, you find a hard-shelled pit, like the pit of a peach. The husk is hard to crack. Depending on the local climate, the nuts ripen from late September to mid-October.

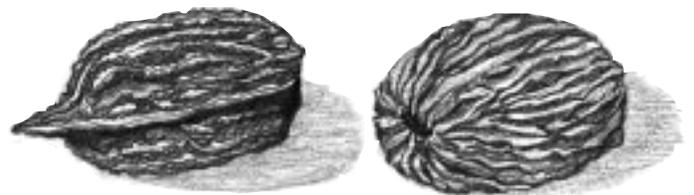
Butternut trees usually begin producing nuts when they are 20 years old. Thirty- to 60-year-old trees with large crowns produce the most nuts. Although butternut trees usually produce nuts every year, they only produce a large crop every two or three years. To collect the nuts, you can knock them from the tree or wait until they fall to the ground.

BARK

On young trees, the bark is grey and smooth. As the tree matures, the bark separates into wide, flat-topped ridges.

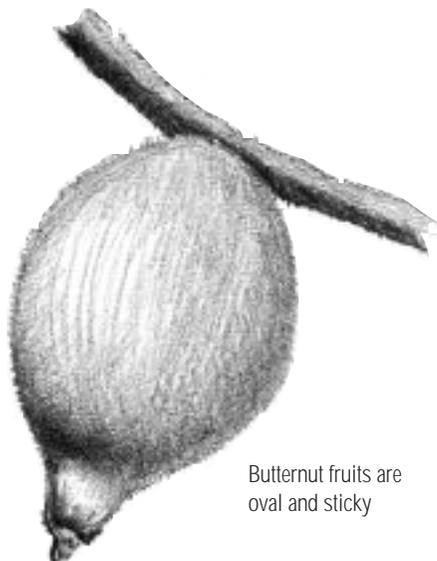
FLOWERS

In Ontario, butternut trees usually flower in May, depending on the local climate.

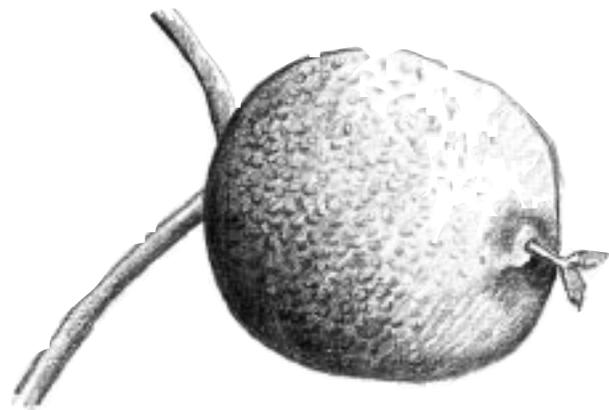


Butternuts have jagged ridges

Black walnuts have rounded ridges



Butternut fruits are oval and sticky



Black walnut fruits are round

WHERE BUTTERNUT GROWS BEST

LOCATION

Butternut trees grow in mixed forests throughout the Deciduous and the Great Lakes-St. Lawrence Forest regions of southern Ontario. In Quebec, butternut is found along the St. Lawrence River. Another population of butternut grows along the St. John River in New Brunswick. Rarely abundant in any one location, butternuts grow well in shallow valleys, along stream banks and on gradual slopes. They are usually found as scattered individuals or in small groups in mixed hardwood stands, along fence lines or in open fields.

SOIL

Butternut trees grow best in deep, moist, well-drained soils of fine to medium texture. However, as its soil requirements are less demanding than other hardwoods, butternut will grow on shallow, rocky sites, especially those of limestone origin.

SHADE OR SUNLIGHT?

Butternut trees are shade-intolerant, which means they don't do well in shaded conditions. They thrive in open areas, like fence lines and fields, where they get full sunlight.



HOW TO GROW BUTTERNUT TREES FROM SEED

Collect the ripe nuts in the fall for planting in the fall or the spring. Fall planting is easier. Spring planting is more difficult and time-consuming.

Whenever you plant, don't let the seeds dry out. Seeds with a moisture content level below 20 per cent do not usually germinate with much success.

Fall-planted and spring-planted seeds germinate in May. Most will germinate the first year, but some may take two or three years.

HUSKING

While not absolutely necessary, removing a seed's husk before planting in the fall or the spring increases its chances of germinating. But you can also plant seeds with husks that have been softened. To soften the husks, pour boiling water over the nuts and soak them overnight. Plant the nuts the next day.

There are many ways to remove the husks:

Mechanical huller

- Mechanical hullers are similar to corn shellers
- Available through nut growing associations

Cement mixer

- Place equal amounts of nuts and water in the mixer
- Run the mixer until the blades have removed the husks

Hose

- Store the seeds in a plastic bag in a refrigerator for two to three weeks until they become dark and soft
- Wash the husks off with a high-pressure hose

FALL PLANTING

1. Collect nuts in September and early October.
2. Remove or soften the husks.
3. Plant the nuts in an open area at a depth of one to two times their thickness.
4. For best results, place a mulch over the seedbed to prevent freezing and thawing during the winter months.

- Remove the mulch in April to let the seedbeds warm up so that the seeds can germinate.

SPRING PLANTING

If you are going to plant the nuts in the spring, you'll need to store them over the winter and bring them out of a dormant condition before the spring. The process of bringing them out of dormancy is called stratification. It mimics the natural temperature and humidity changes a seed experiences during winter and spring.

There are two methods for storing the nuts over the winter. The small seedlot method is convenient and easy if you have the necessary refrigerator space. The pit method is suitable for large quantities of nuts. Storage and stratification occur naturally under outside winter conditions.

Small Seedlot Method

- Remove the husks.
- Air-dry the nuts until their moisture content is 20 per cent. To determine when this level has been reached refer to the table below.

- When the desired moisture content has been reached, store the air-dried nuts in dark-colored 4-mil polyethylene bags and refrigerate at two to five degrees Celsius.
- Ninety to 120 days before you intend to sow the seeds begin the stratification process. In Southern Ontario, this is usually done in the first week of January.
- Begin the stratification process by removing the nuts from the refrigerator and soaking them in water (aerated if possible) for 48 hours. Use two times the volume of water as the volume of nuts.
- Air-dry the nuts, then place them in 4-mil dark-colored polyethylene bags, but this time also include in the bags a "stratification medium" such as moist peat, moist sand and peat or moist vermiculite. The amount of medium used in each bag should be about two to four times the volume of seed.
- Seal the bags and place in the refrigerator at a temperature of two to five degrees Celsius for 90 to 120 days.
- Plant the nuts.

STEPS TO DETERMINE MOISTURE CONTENT OF NUTS

STEP ONE

- Select a sample of 10 fresh nuts.
- Weigh the sample.
Weight of fresh sample (Sw) = _____ grams
- Dry the sample in the oven at 100 degrees Celsius until the weight of the seeds remains constant.
Weight of dried sample (Sd) = _____ grams
- Calculate the amount of moisture (moisture content) in the sample.
Moisture content (MC) = $\frac{Sw - Sd}{Sw}$
MC = _____
- Discard the sample.

STEP TWO

- Weigh the entire batch of nuts to be dried.
Weight of fresh batch (Bw) = _____ grams
- Calculate the target weight for the batch to bring the moisture content down to 20 per cent using the following formula:
 $(Bw \times [1 - MC]) + ([Bw \times MC] \times 0.2)$

HERE IS AN EXAMPLE

STEP ONE

If the fresh sample weighed 200 grams and the dried sample weighed 80, then you can calculate the moisture content in the following manner:

$$MC = \frac{200 - 80}{200} = 0.6$$

STEP TWO

If the entire batch of nuts to be dried weighed 800 grams, then you can calculate the target weight in the following manner:

$$\text{Target Weight} = (800 \times [1 - 0.6]) + ([800 \times 0.6] \times 0.2)$$

The target weight is 416 grams.

Pit Method

1. Remove the husks.
2. Dig a pit in a shady, well-drained location. The pit should be deep enough to store all the nuts below the frost line. In most locations, a one-metre-deep pit will do.
3. Build a wooden frame box with a removable lid which will fit inside the pit. Line it with six-millimetre wire-mesh screen. The screen will protect the nuts from rodents.
4. Build several wooden frames and cover them with screen. Make the frames the right size to fit inside the box like trays and small enough to be handled by one person.
5. Soak the seeds in water for 48 hours.
6. Place a double layer of the soaked nuts on a screened tray.
7. Cover the nuts with five centimetres of moist sand.
8. Place the tray inside the box.
9. Add more trays of nuts and sand until you reach the frost line.
10. Cover the stack of trays with the frame lid.
11. Fill in the rest of the pit with sand.
12. Dig a shallow trench around the pit to drain water away.
13. In mid-April, remove the seeds from the pit.
14. Clean the sand off the nuts.
15. Soak the nuts in water for 24 hours.
16. Drain and air dry the nuts for two hours before planting to prevent mold or mildew.
17. Plant the nuts in an open area at a depth of one to two times their thickness

MANAGEMENT & CONSERVATION

Butternut trees will not survive in the shade. To help butternut seedlings survive, remove competing vegetation and shade trees.

Prevention and conservation are the best ways to protect butternut trees from butternut canker. While there is no way to fully prevent the disease, you can slow its progress by not transporting diseased logs into disease-free areas. You should

also adopt logging practices that reduce injuries to the trees not being cut. Damaged trees are more susceptible to disease. Conservation involves protecting any butternut trees that might survive and reproduce the species. This is particularly important for disease-resistant trees that could provide the genetic material researchers need to develop a butternut breeding program.

BUTTERNUT HEALTH

Like all trees, butternuts are vulnerable to various insects and diseases. Nut weevils, wood borers and bark beetles affect butternut health. But the most common insect threat comes from the butternut curculio. The larvae causes the most damage by burrowing into the young shoots, the leaf petioles and the fruit of the tree. To identify butternut curculio, look for a white grub in unhealthy new shoots. The larvae sometimes kill all of the new shoots.

The most serious threat to butternuts is the butternut canker. This fungal disease has been found in about 90 per cent of the butternuts in Ontario that have been examined. With the exception of an area in the Maritimes, the disease is found throughout the species' entire North

American range. Butternut trees have already disappeared from many parts of the U.S.

There is no known cure for the butternut canker disease. Researchers are conducting studies to determine the extent and severity of the disease in Ontario. They are also looking for trees which may be resistant to the disease. If the selected trees are resistant, they may be used to produce canker-resistant stock for future planting.

The following extension notes will help you grow and care for your butternut trees:

- *Tree Guards Protect Your Trees*
- *Planting and Caring for Nut Trees*
- *Tree Shelters Help Hardwood Trees Grow Faster*

Produced by the LandOwner Resource Centre, the Ontario Ministry of Natural Resources and the Eastern Ontario Model Forest.

