

Plants 4 Bees - Maple

Common Name: Maple including the sugar maple, black maple, red maple, Manitoba maple, silver maple, etc.

Scientific Name: *Acer Spp.* including *A. saccharum* Marsh, *A. rubrum*, *A. nigrum*, *A. negundo* L., *A. saccharinum*,

Distribution: The sugar maple, the quintessential ‘Canadian’ tree, is found in Zone 4 from the Ontario/Manitoba border to the Maritimes. The Manitoba maple is more robust and can be found throughout the Prairies as well as most of southern Canada.

The taxonomy of the *Acer* genus has not been widely accepted and as a result there are differing points of view on the number of species, sub-species and varieties in existence. There between 110 and 125 species of maple trees, 10 to 13 of which are native to North America. The genus *Acer* originated in China and spread throughout the northern hemisphere.

The sugar maple (*Acer saccharum*) is closely related to the black maple (*Acer nigrum*). The western American bigtooth maple (*Acer grandidentatum*) is also treated as a variety or subspecies of sugar maple by some botanists. Boxelder or Manitoba maple (*Acer negundo*) is the most widely distributed of all North American maples – its native range extends from the east to the west coast and from Alberta to southern Mexico and Guatemala. It has become naturalized in areas far outside of its native range, including Europe. It is not known from northern Canada.

Norway maple (*Acer platanoides*), an introduced European species, is often planted and looks similar to sugar maple, but Norway maple has broader leaves with drooping lobes, and sap from a broken petiole is milky not clear. The sycamore maple (*Acer pseudoplatanus*), another European import, is only suitable for the southern most regions in Canada, although with climate changes this range may increase. It is considered a valuable early season nectar source.

Description: Maples (family *Aceraceae*) are medium to small deciduous trees with watery sap which is sometimes sugary. They have a dense, spreading crown, 25 to 40 m in height; light gray to gray-brown bark, that is rough, deeply furrowed and darkens with age. The leaves are opposite, have long petioles, from 5 to 11 cm long and about as wide. In North America, the only maple that does not have a palmate leaf with distinct lobes is *A. negundo* which is sometimes called “Ash-leaf maple” because it has a compound leaf like members of the ash family. Generally maples have 5 short-pointed lobes, edges coarsely toothed, dark green above, whitish and more or less hairy below, turning intensely red, orange, or yellow in fall.



Flowers of red maple.

The flowers of most maples are small, greenish-yellow without petals, often in long-stalked, drooping clusters or racemes, each cluster with 8 to 14 flowers. Flowering occurs in early spring (March-May, with or just before the leaves) after 30 to 55 growing degree days. Most trees are either male or female, sometimes the sexes are segregated on different branches. The fruits are winged nutlets (samaras) in a pair, 2 to 2.5 cm long, clustered on long stalks, yellowish-grey to red-brown. The seeds fall from the tree in autumn and or through winter.

The fall color is often spectacular, ranging from bright yellow through orange to fluorescent red-orange. Sugar maples have a tendency to color unevenly in fall. In some trees, all colors above can be seen at the same time.

Sometimes (especially with *A. rubrum*) a certain part of a mature tree can change color weeks ahead of the rest of the tree. The colours tend to be brighter and more varied in the east with more limited yellows in the west.

Ecology: Manitoba maple is one of the fastest growing trees in many western regions. Blossoms appear before the leaves unfold in April and May. The trees are useful for quick growth in riparian plantings, but they tend to be short-lived and subject to disease. Its tolerance to urban conditions, compacted soils, drought and cold makes it useful for reclamation of disturbed sites. Boxelder is a tree of river bottoms and disturbed sites on heavy, wet soils, often seasonally flooded (up to 30 days). Populations in native habitats have decreased because of clearing of bottomland forest for agriculture, but they have greatly increased in urban areas. Success of the species on disturbed urban sites owes to its prolific seed production and wide dispersal, ease of germination, tolerance of low oxygen conditions, and fast growth on clay or heavy fill. makes it useful for reclamation of disturbed sites. Boxelder is a tree of river bottoms and disturbed sites on heavy, wet soils, often seasonally flooded (up to 30 days). Populations in native habitats have decreased because of clearing of bottomland forest for agriculture, but they have greatly increased in urban areas. Success of the species on disturbed urban sites owes to its prolific seed production and wide dispersal, ease of germination, tolerance of low oxygen conditions, and fast growth on clay or heavy fill.

Sugar maple flowers.

Sugar maple is widely planted as an ornamental or shade tree. The species is best suited to larger sites where soil compaction is not a concern, thus it is generally unsuitable for urban areas. The sugar maple can grow in any type of soil, except sand, most commonly occurring in rich, mesic (moist) woods but also in drier upland forests. *A. saccharum* is among the most shade tolerant of large deciduous trees. Among North American maples its shade tolerance is exceeded only by the striped maple (*Acer pensylvanicum*), a smaller tree. Increases in sugar maple during the past 50 years in central and Great Lakes hardwood forests have been attributed to fire suppression.



Methods of Reproduction and Spread: Minimum seed-bearing age for sugar maple is 30 to 40 years; maximum seed production is reached after about 60 years of age (seed quantity is of course related to pollen and nectar production). Seeds of all the maples are dispersed in fall and germinate in spring. Germination occurs on moist mineral soil or in the litter layer, at an optimal temperature of about 1°C. Seeds can remain viable for up to 5 years and require moist stratification at temperatures slightly above freezing for 35 to 90 days. In the northern part of its range, stump sprouting and root sprouting are moderately common means of vegetative reproduction.

Flowering in boxelder is in early spring and large quantities of seed are produced each year, beginning on trees 8 to 11 years old. The flowers are wind pollinated but also visited by bees. The seeds ripen in autumn, fall continuously from autumn until spring, and are light, large-winged, and widely wind-dispersed. They over-winter and germinate the following spring. Best germination follows stratification for 60 to 90 days at 1°C. Boxelder seeds germinate in shade or full sun, successful seedbeds vary greatly. Trees can, produce up to 2.5 cm diameter annual growth for the first 15 to 20 years. Early growth is best in full sun but tolerant of partial shade. Young trees commonly produce stump and root sprouts. Average longevity is about 60 years; maximum longevity is rarely more than 100.

Honey/Pollen Potential: Honey bees begin to gather nectar/pollen just as soon as spring temperatures are about 12 to 15°C. Only a few early blooming plants/trees are available to fill this need. Much of this early flow comes from trees such as maple, willow, etc. Because red maple flowers come out very early in the spring, they are important first source of nectar for honeybees. Although the flowers appear to be wind-pollinated, the early-produced pollen may be important to the biology of bees and other pollen-dependent insects because many insects, especially bees, visit the flowers.

Article compiled by: Douglas Clay

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Maples and syrup

- The Sugar Maple is one of the most important Canadian trees, forming the major source of sap for maple syrup production.
- Many maples can be used as a sap source for maple syrup but sugar maples are the only tree used for commercial syrup production.
- Black maple is second best variety but it only has half the sugar content of sugar maple.
- The sap, collected in spring, is concentrated by boiling or reverse osmosis. It takes 35 to 40 litres of sap to make 1 litre of syrup.
- A single tree may produce 5 to 60 liters of sap per year. Nights below freezing and days at higher than 5°C are needed to ensure good sap flow.
- Sugar maple was the premier source of sweetener, along with honey, to Native Americans and early European settlers. Native Americans also used sugar maple sap for sugar and candies, as a beverage, fresh or fermented into beer, and soured into vinegar and used to cook meat.