

Know Your Maples

Native Wisconsin Maples

Sugar Maple L. *Acer saccharum*

(pronounced *ā'sēr sak-kār'um*), often called Rock Maple or Hard Maple

Form: Height 80 to 100 feet or more, diameter 2 to 3 feet; symmetrical, heavy, round crown visible on individual trees that grow in the open.

Bark: On young trees, light gray to brown and somewhat smooth; on older trees, the bark becomes deeply furrowed and can be gray to almost black with long, irregular plates or scales which often loosen on the sides. Bark is tremendously variable on this species. Twigs are smooth and reddish-brown with sharp-pointed winter buds.

Leaves: Opposite; simple, lobed; 3 to 5 inches long with 5 lobes; lobes wavy toothed; dark green on upper surface, paler green below; in autumn leaves turn brilliant shades of yellow, orange and scarlet.

Flowers/Fruit: Flowers in April to May before leaves emerge. The fruit is a pair of fused samaras, somewhat horseshoe-shaped, about 1 inch long that matures September-October. A clear sap is visible when the petiole is removed from the stem.

Range: Found throughout the state on the better soils.

Wood: Light brown, hard, heavy, strong, close-grained; known commercially as hard or rock maple; used in the manufacture of flooring, furniture, musical instruments, butcher blocks, cutting boards, fuel and for many other home, farm and industrial uses. Maple sugar, probably the most widely known maple product, is produced commercially by boiling down the sweet watery spring sap. It takes 35 to 40 gallons of maple sap to make one gallon of syrup.

Landscape: One of the best of the larger shade and lawn trees. It has beautiful fall color and a pleasing growth habit.

Champion Tree: Our sugar maple champion is located in Jefferson County. Its 76 feet high, has a 69 foot crown spread and a circumference of 206 inches! It was measured in 2004.

Red Maple L. *Acer rubrum*

(pronounced *ā'sēr rŭ'brum*), also called Scarlet Maple, Swamp Maple

Form: Height 40 to 65 feet, diameter 10 inches to 2 feet, sometimes larger; forms a narrow, rounded crown.

Bark: Smooth, light gray on young stems; dark gray and rough on old limbs and trunk; old bark divided by shallow fissures into flat, scaly ridges at surface, making tree look shaggy.

Leaves: Opposite; simple, 2 to 5 inches long, 3 to 5 lobes, with double-toothed margins; upper surface light green when mature; lower surface whitish and partly covered with pale down. Winter buds are small, red and somewhat rounded. Red maple's brilliant fall colors often match those of the sugar maple however, it is a smaller tree and tends to be scattered in the forest.

Flowers/Fruit: Flowers in March into April before the leaves appear. Fruit is a samara, 2 winged; $\frac{1}{2}$ to 1 inch in length on long, drooping stems; red, reddish-brown or yellow; ripens in late spring and germinates immediately.

Range: Occurs over the entire state; prefers moist soils, though is common on drier sites in mixture with other trees.

Wood: Heavy, close-grained, rather weak, light-brown; used in furniture manufacturing, woodenware and fuel.

Landscape: Shape and beautiful foliage colors make red maple an important tree for lawn, park or street.

Champion Tree: Our red maple champion is located in Brown County. Its 62 feet high, has a crown spread of 68 feet and a circumference of 175 inches! It was measured in 2004.

Silver Maple L. *Acer saccharinum*

(pronounced *ā'sēr sak-kār-ī'nŭm*), also called Soft, White or River Maple

Form: Height up to 100 feet, diameter 3 feet or more; trunk usually short, divided into a number of long ascending limbs which are again divided; their small branches droop, but turn upward at tips, forming large, spreading round crowns. It is the fastest growing American maple tree. Unfortunately, with fast growth comes a weak-wooded tree that will often break in wind, ice and snow storms.

Bark: On young trees or branches, smooth and varies in color from reddish to a yellowish-gray; on old branches, dark gray and broken into long flakes or scales.

Leaves: Opposite; simple; 3 to 5 lobes ending in long points separated by deep, angular openings; margins toothed; pale green on upper surface and silvery underneath; buds rounded and red or reddish brown.

Flowers/Fruit: Flowers in early to mid-March, before leaves. Fruit is a pair of winged samaras; wings 1 to 2 inches long; samaras on slender, flexible, thread-like stems about 1 inch long. Fruits mature in spring, and germinate immediately. It is one of the largest fruited maples.

Range: Common tree on river bottoms or other deep, moist soils in the southern $\frac{2}{3}$ of the state.

Wood: Light-brown, strong, fairly hard, even texture, rather brittle, easily worked; decays readily when exposed to weather or soil; occasionally used for flooring, furniture and fuel; often mixed with red maple for commercial purposes.

Landscape: Popular as a shade tree, but branches are apt to be broken in storms and it can become a liability with age.

Champion Tree: Our silver maple champion is located in Columbia County. Its 80 feet tall, has a crown spread of 110 feet and a circumference of 293 inches! It was measured in 1988.

Boxelder L. *Acer negundo*

(pronounced *ā'sēr ne-goōr'ā*) also called Ash-leaved Maple.

Form: Height up to 70 feet, diameter rarely exceeds 24 inches; typically forms a short, tapering trunk, dividing into stout branches forming a bushy, spreading crown with a ragged appearance. It grows extremely fast when young; can grow 15 to 20 feet in a 4 to 6 year period, but the wood is weak and may break up in ice and wind.

Bark: Branches and young trunks smooth and grayish-brown, older trunks distinctly narrow ridged.

Leaves: Opposite, compound, with 3 to 5 coarsely and irregularly toothed leaflets, each 2 to 4 inches long and 2 to 3 inches wide. This is the only native maple with pinnately compound leaves.

Flowers/Fruit: Flowers in March to April. Paired samaras with wings about 1 $\frac{1}{2}$ to 2 inches long, parallel or in-curved, borne in drooping clusters. Fruits mature in September-October but fruit-stalks may persist far into winter.

Range: Common throughout the state. Typically found in low moist areas, floodplains and stream banks.

Wood: The wood is soft, light, weak, close-grained and decays readily in contact with heat and moisture. It is used occasionally for fuel and pulpwood.

Landscape: Not recommended for planting in Wisconsin. If grown, careful attention to pruning maybe necessary.

Champion Tree: Our boxelder champion is located in Manitowoc County. State registry records from 1980 list it as 40 feet tall, with a crown spread of 66 feet and a circumference of 162 inches!

Mountain Maple L. *Acer spicatum*

(pronounced *ā'sēr spi kā'tum*)

Form: Height is variable, from 10 to 30 feet. A large shrub or sometimes a small, bushy tree with upright branches.

Bark: Thin, brownish or grayish brown, smooth, eventually becoming slightly furrowed or warty.

Leaves: Opposite, simple, lobed, 3 to 5 inches long, coarsely and irregularly toothed, smooth above, covered with a gray down beneath, veins prominent, autumn color orange and scarlet.

Flowers/Fruit: Flowers in May-June, after leaves have emerged. Flowers in dense upright clusters. Samaras with wings mature by midsummer, $\frac{3}{4}$ to 1 inch long, often paired and brilliant red.

Range: Widely distributed in Wisconsin, but more common in the north. Prefers cool shady moist soil, wet forests.

Landscape: A native woodland tree.

Striped Maple L. *Acer pennsylvanicum*

(pronounced *ā'sēr pen-sil-vā'nī-kum*) also called, Moosewood, Whistlewood, Snake Bark Maple or Goose Foot Maple.

Form: Height 15 to 30 feet in the wild. Large shrub or small tree with a short trunk and rather erect branches that form a broad crown.

Bark: Greenish with prominent white stripes. Older trunks lose the pronounced striping and become rougher, darker and less streaked.

Leaves: Opposite, simple, three lobed, 5 to 7 inches long, shaped like a goose foot. Vibrant yellow in autumn.

Flowers/Fruit: Flowers in May-June, when leaves are nearly full grown. Fruit is a paired samara about $\frac{1}{2}$ to 1 inch long, with wings spreading at a wide angle. Fruit matures in September.

Range: Very rare in Wisconsin. It is currently on our state's species of special concern list.

Landscape: Native tree of special concern.

Glossary

Champion Tree Registry – A verified listing that records the measurements of Wisconsin's largest trees. Trees are nominated by interested citizens across the state. Nominations must be verified by "big tree inspectors" before the information is entered in the official record book. Currently the registry totals over 2200 records. Many of the trees in the registry are in need of updated information. Citizens are encouraged to re-measure and nominate champions to the Champion Tree Program, Wisconsin DNR.

Circumference – the distance around the trunk of a tree to the nearest inch. This measurement is taken at 4 $\frac{1}{2}$ feet above ground level.

Compound leaf – a leaf composed of 2 or more similar parts.

Crown – the top branches of a tree

Leaflet – a foliar element of a compound leaf

Margin – the edge of a leaf

Petiole – a leaf-stalk.

Samara – a dry fruit bearing a wing

Simple leaf – a leaf that is not divided into separate parts.

Non-native Wisconsin Maples

Amur Maple L. *Acer ginnala*

(pronounced *ā'sēr gi-nā'la*), also called Siberian maple.

Form: Height 15 to 25 feet, spread equal to or exceeding height and much branched. Sometimes considered a shrub.

Bark: Grayish brown on older branches.

Leaves: Opposite, simple 1 $\frac{1}{2}$ to 3 inches long, lobed. It is the only one of the simple-leaved maples where the leaves are clearly longer than wide. Shades of yellow and red in the fall.

Flowers/Fruit: One of the few maples with fragrant flowers. Flowers in April-May. Samaras $\frac{3}{4}$ to 1 inch long; with wings that are nearly parallel, red in summer, mature in September-October.

Range: Scattered throughout the state. A horticultural species in urban plantings.

Landscape: Multi-stemmed character limits street tree use. It may compete with native flora.

Norway Maple L. *Acer platanoides*

(pronounced *ā'sēr plat-an-ōi'dēz*)

Form: Height 40 to 50 feet, occasionally over 90 feet. A medium tree with a rounded, symmetrical crown.

Bark: Grayish black with ridges and shallow furrows.

Leaves: Opposite, simple, 4 to 7 inches wide, 5 lobed, teeth regular, a milky white sap is visible when petiole is removed from stem. Leaf color can range from dark purple to green. Autumn color yellow.

Flowers/Fruit: Flowers in April before the leaves appear. Paired samaras mature in September-October, wide and spreading, each 1 $\frac{1}{2}$ to 2 inches long, wings almost horizontal.

Range: Scattered throughout the state.

Landscape: Widely planted as a street or yard tree. It may compete with native flora.

Champion Tree: Our Norway maple champion tree is located in Waushara County. Records from 2004 state that it is 72 feet tall, with a crown spread measurement of 70 feet and a circumference of 179 inches!

Hedge Maple L. *Acer campestre*

(pronounced *ā'sēr kam-pes'trē*) also called Field maple.

Form: Height 25 to 75 feet but commonly a tree 25 to 35 feet tall. It is very slow growing and usually rounded and dense, often branched to the ground.

Bark: Corky, fissured, gray-black.

Leaves: Opposite, simple, lobed, 2 to 4 inches long, leaf margins have few rounded teeth or are toothless, petiole when detached yields a milky sap. Leaves dark green in summer changing to yellow-green or yellow in fall.

Flowers/Fruit: Flowers in May. Samara 1 $\frac{1}{4}$ to 1 $\frac{3}{4}$ inches long matures in August-September, paired, usually downy with wings spreading horizontally.

Range: Mainly in SE part of the state. Prefers rich, well-drained soils but tolerates dry soils and compaction.

Landscape: Good under utility lines because of low height, withstands severe pruning, Lack of cold hardiness, limits its use throughout the state. This tree was introduced in colonial times to the United States.

Champion Tree: Our hedge maple champion is located in Milwaukee County. Records from 1992 state that it is 82 feet tall, has a crown spread of 58 feet and a circumference of 104 inches.

Japanese Maple L. *Acer palmatum*

(pronounced *ā'sēr pal-mā'tum*)

Form: Height can reach between 15 to 50 feet but commonly 15 to 25 feet tall. Branches often assume a layered effect.

Bark: Young stems vary from green to reddish purple and red. Older branches are gray cast.

Leaves: Opposite, simple, 2 to 5 inches long and wide, deeply lobed, often 5 to 9 lobes, irregularly toothed, color varies, generally dark green, autumn color bright scarlet and yellow.

Flowers/Fruit: Flowers May to June, before leaves. Samaras are $\frac{1}{2}$ to $\frac{3}{4}$ inches, paired, wings at wide-spreading angle, ripen in September-October.

Range: Scattered ornamental plantings throughout the state.

Landscape: Used as an artistic accent plant. Lack of cold hardiness, limits its use throughout the state. Native to Japan, China and Korea. It was introduced to England in 1820. Long cultivated by the Japanese.

Champion Tree: Our Japanese maple champion is located in Brown County. It is 29 feet tall, has a crown spread of 21 feet and a circumference of 26 inches! It was last measured in 2004.

Why We Have Fall Color

Toward the end of summer, as days grow shorter, the stage is set for the biological equivalent of the "Greatest Show on Earth," the annual change of color in Wisconsin woodlands. Summer green gradually gives way to the brilliant hues of fall.

Although, shorter days and less daylight determine the timing of fall color, temperature and weather conditions also play a big role in the intensity and duration of fall color. As days become cooler and temperatures decrease, internal changes occur in the trees and plants of our deciduous forests. Chemical changes turn leaves from summer green to red, orange, gold and brown prior to leaf fall.

There are three types of pigments directly involved in painting our fall woodland landscape. They are called chlorophyll, carotene and anthocyanin. Chlorophyll is present in leaves year round and gives them their green color throughout the growing season. In a process called photosynthesis, chlorophyll utilizes the sun's energy to produce simple sugars – the trees food – from water and carbon dioxide. Trees in temperate zones store these sugars during their winter dormant period.

With shorter days and cooler weather signaling the approach of winter, chlorophyll production slows and eventually subsides. As the chlorophyll in leaves disappears, persisting pigments called carotenoids are revealed. Additionally as sugars become trapped in leaves, a class of pigments called anthocyanins, form in cell sap. Carotenoids are large molecules present in leaf chloroplasts, attached to cell membranes, but because the green coloration of chlorophyll predominates, they aren't seen through the growing season. The pigment carotene is responsible for the yellow coloration of fall leaves.

As fall approaches and daylight shortens, and chlorophyll subsides, veins that transport sugars out of the leaf close. High concentrations of sugars now trapped in the cell sap react with certain proteins to form anthocyanins. The color produced by the anthocyanins is sensitive to the pH of the cell sap. If the sap is quite acidic, the pigments impart a bright red color, if the cell sap is less acidic, its color is more purple. Anthocyanins cause the brilliant reds, scarlets and purples of the fall season. In some oaks and a few other trees which have leaves with high tannin content, the leaves may turn brown as the chlorophyll breaks down.

As the pigments break down, leaves ultimately turn brown and fall to the forest floor. Decomposing leaves slowly return nutrients to the soil and become part of the humus layer that absorbs rainfall and provides food for numerous organisms of the forest ecosystem. The leaves of broadleaved plants are tender. The fluid in the cells of these leaves is often a thin watery sap that freezes readily and cannot survive temperatures below freezing. Leaf tissue unable to over winter, is sealed off and shed to ensure the plants continued survival. Thus leaf fall precedes each winter in temperate zones.

The best weather for fall color in Wisconsin is dry, bright, sunny, warm days followed by cool, dry nights with temperatures that remain above freezing. These weather conditions promote the production of anthocyanins within the leaves and the orange, reds and purples of the fall landscape.

Certain trees and shrubs are commonly associated with fall color. Green ash and aspen leaves turn golden yellow. Sugar maple leaves change to brilliant yellow, burnt orange or mix of red tones, since there is great variation among members of this species. Red maple can become a brilliant red; oak and hickory reddish brown; white ash a deep purple and sumac a scarlet red. Tamarack turns a deep golden yellow and loses its needles in the fall. It's the only conifer (evergreen) tree in Wisconsin that does! Other evergreens such as, pines, spruces, cedars, and firs remain green.

Our brilliant fall woodland colors occur in only a few places on earth and during special years it can be truly spectacular. You can find autumn color in forests, parks, small woodlots, cities and throughout the countryside. Take time to sit and watch the leaves turn and admire nature's last fling before settling down into winter's sleep.

Helpful Teacher Resources from Wisconsin's Division of Forestry are listed below.

Forestry program information, publications and more can found online. Come visit us at <http://dnr.wi.gov> and click on Natural Resources, Forestry.

PUB-FR-053 - *Forest Trees of Wisconsin* (pocket identification booklet)
 PUB-FR-101 - *Forest Trees of Wisconsin* (poster)
 PUB-FR-147 - *Questions & Answers about Wisconsin's Forests*
 PUB-FR-183 - *New Tree Planting*
 PUB-FR-256 - *Proper Tree Pruning*
 PUB-FR-272 - *In Grandpa's Woods - The Forest Trail of Discovery*
 PUB-FR-108 - *The Forests Where We Live*
 PUB-FR-313 - *10 Ways to Protect Your Woodlands*

Download a printable version of "Know Your Maples."
<http://dnr.wi.gov/org/caer/ce/eeek/teacher/pdf/knowyourmaples.pdf>

Online Tree Identification Keys
 Environmental Education for Kids (EEK) Tree Key
<http://dnr.wi.gov/org/caer/ce/eeek/veg/treekey>
 Learning, Experiences, & Activities in Forestry (LEAF) Tree Key
<http://www.uwsp.edu/cnr/leaf/treeid.htm>
 Additional keys found on the Division of Forestry web site
<http://dnr.wi.gov/org/land/forestry/treeid/keys.htm>

Note: Leaf and samara illustrations on back of poster are not to scale. Leaves and samaras of individual trees may vary.

Text by Genny Farnucchi, Forest Resource Education and Awareness Specialist and Robert (Chris) Welch, Assistant Forest Resource Educator, WDNR and adapted from the following resources, *Manual of Wood, Landscape Plants* by Michael A. Dirr; *Trees, Shrubs and Vines* by Arthur T. Vertes and *Fall Color and Woodland Harvests* by C. Ritchie Bell and Anne H. Lindsey. Back design and illustrations by Linda Pohlod, Blue Sky Design, LLC.

"The wonder is that we see these trees and not wonder more."

Ralph Waldo Emerson