

Forestry Tree/Leaf ID

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Is it a leaf? Or What is a Leaf?

- Wikipedia: “above ground plant-organ that specializes in photosynthesis.”



Identifying trees

- Leaves
 - Needle or broad leaf
 - Shape
 - Color
 - Smell
 - Texture
 - Margins
- Bark
 - Color
 - Texture
 - smell
- Twigs
 - Color
 - Buds
 - pith
- Fruit
- Flowers
- Habitat
 - Landscape position
 - Aspect
 - Soils

Landscape position and aspect

- Top of the hill
- Side of the hill
 - Direction facing
- Bottoms
- Coves

Aspect

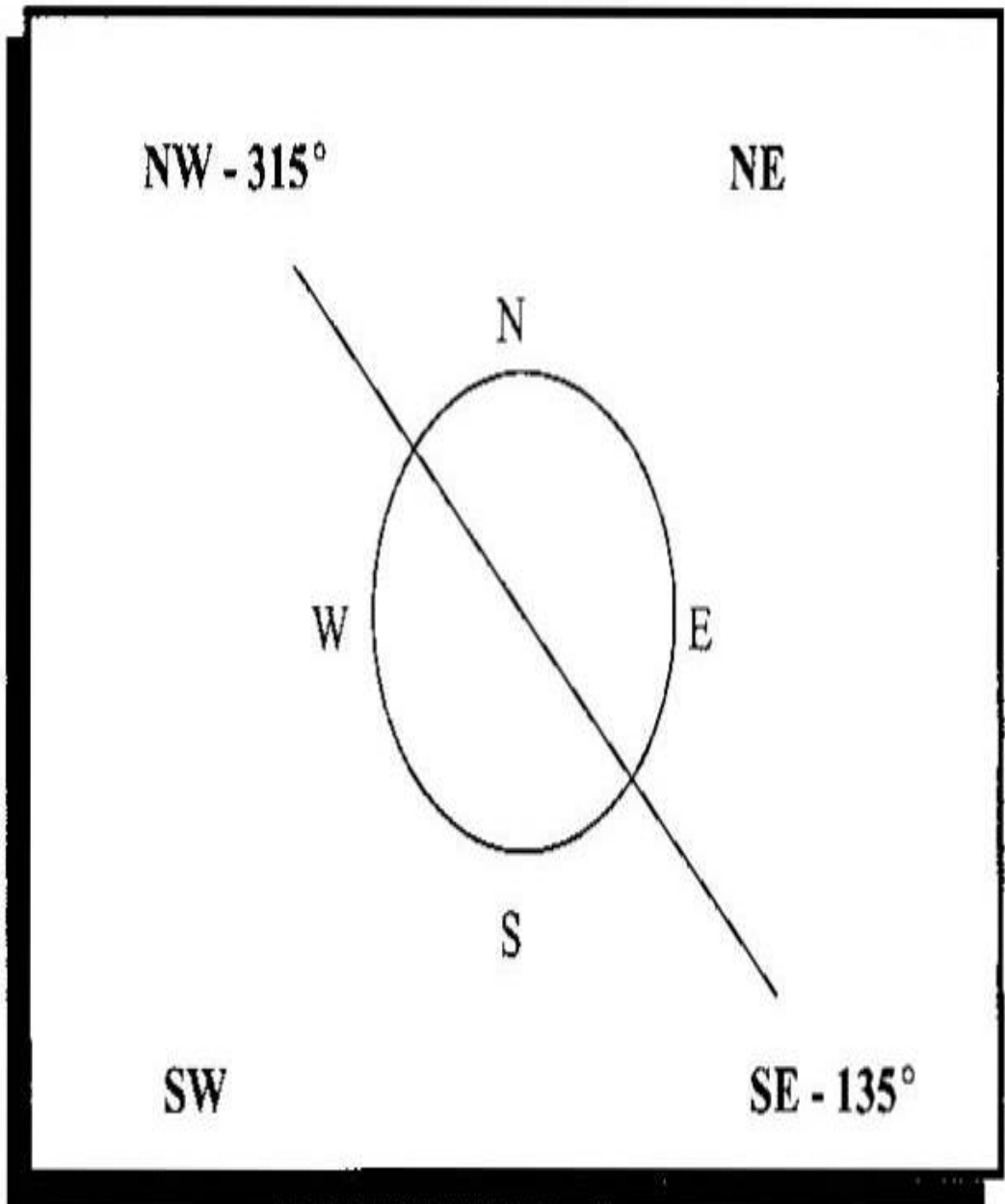


Figure 8. Method of determining aspect.

Aspect

SOUTH WEST

White pine, Virginia pine,
(above 1000ft)

Loblolly pine, shortleaf pine
(below 1000ft)

Scarlet oak, white oak,
hickories

NORTH EAST

Yellow-poplar, mixed
hardwoods

Red, white, black oaks

White pine (above 1000ft)

Loblolly pine (below 1000ft)

STREAM BOTTOMS AND TERRACES

Yellow-poplar, mixed hardwood,
red, white, black oaks

White pine (above 1000ft)

Loblolly pine (below 1000ft)



Ok the one plant you need
to know that is not a tree

A photograph of a Poison Ivy plant. The leaves are bright green and have a characteristic three-lobed shape. A red circle is drawn around a cluster of these leaves. In the background, there are other green plants and a tree trunk.

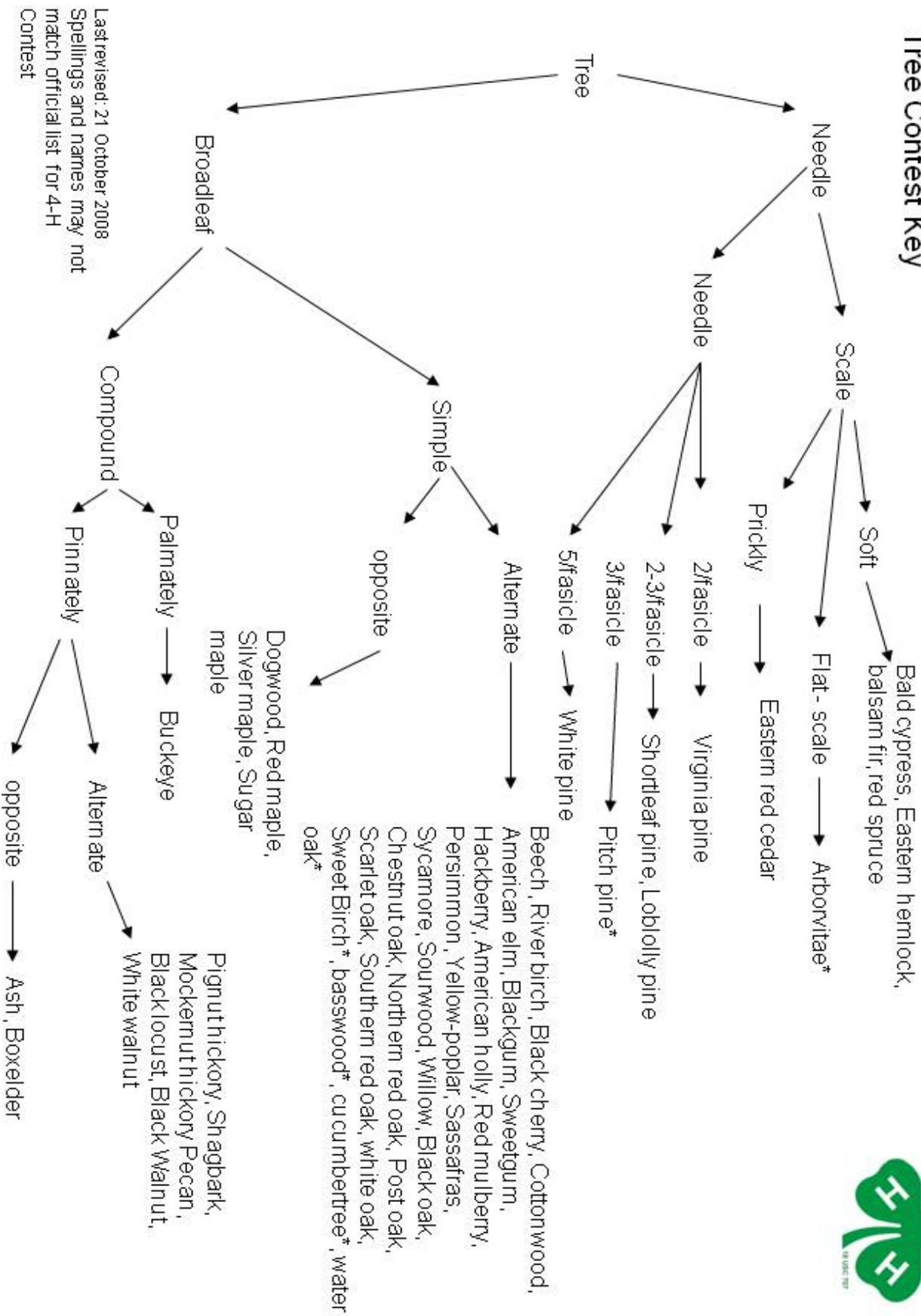
Poison
Ivy

Might be
confused with a
tree

Needle vs broadleaf



Tennessee 4-H Forestry Tree Contest Key



Last revised: 21 October 2008
Spellings and names may not
match official list for 4-H
Contest

Needle type

- Soft
 - bald cypress, eastern hemlock, red spruce*, balsam fir*
- Flat
 - Arborvitae
- Prickly
 - eastern red cedar
- True needles – pines
 - Loblolly, Virginia, shortleaf, white, pitch*

Arborvitae or northern White cedar



Connecticut Agricultural Experiment Station Archive,
Connecticut Agricultural Experiment Station,

Robert Vidéki, Doronicum Kft.,
www.forestryimages.org

Arborvitae or northern White cedar *Thuja occidentalis*



Leaf: Evergreen, scale-like, on main shoots, 1/4 inch long with long points. Lateral shoots are flattened, 1/8 inch long with short points.

Fruit: A cone, 1/2 inch long, oblong, borne upright on the branches, scales are leathery, red-brown and rounded, with a small spine on the tip.

Twig: New growth is green and scale-like, turning brown, occurring in very flattened foliar sprays.

Balsam fir

Leaf: Flattened needles, 3/4 inch long, blunt or notched at end, may be shorter and sharper pointed on upper branches, shiny dark green above and silvery-blue below.

Flower: Monoecious; males occur on undersides of leaf axils, purple to yellow-brown; females occur in upper crown, are purple and inconspicuous.

Fruit: Resinous cones are upright, 2 to 3 1/2 inches long, oblong to cylindrical, green with purple tinge, with bracts shorter than the scales; scales are deciduous with seed dispersal in late summer.

Twig: Yellow-green, later turning gray; buds are reddish brown and resin covered; leaf scars are flat and rounded.



Joseph O'Brien USDA Forest Service, www.forestryimages.org

baldcypress



UGA0008297



UGA0008296

Paul Wray, Iowa State University,
www.forestryimages.org

Paul Wray, Iowa State University,
www.forestryimages.org



*Photographer: B.
Eugene Wofford*
<http://tenn.bio.utk.edu/>



*Photographer: Edward
W. Chester*
<http://tenn.bio.utk.edu/>

Baldcypress – *Taxodium* *distichum*

- **Leaf:** Linear and small, 1/4 to 3/4 inch long, generally appearing two-ranked. When growing on deciduous branchlets the leaf-deciduous branchlet structure resembles a feathery pinnately (or bi-pinnately) compound leaf; green to yellow-green.
Flower: Males in drooping, long panicles; females are subglobose, have peltate scales, and tend to occur near the end of branches.
Fruit: Cones are composed of peltate scales forming a woody, brown sphere with rough surfaces, 3/4 to 1 inch in diameter; cones disintegrate into irregular seeds.
Twig: May be deciduous or not; non-deciduous twigs are slender, alternate, brown, rough, with round buds near the end of the twig; deciduous twigs are two-ranked, resembling pinnately compound leaves.
Bark: Fibrous, red-brown but may be gray where exposed to the weather; old, thick bark may appear somewhat scaly.
Form: A large tree with a pyramid-shaped crown, cylindrical bole, fluted or buttressed base and often with knees.
- *Taxodium* from *Taxus* and Greek "eidos" (resemblance to *Taxus*). *distichum* in two rows (leaves) Greek "di" (two) and "stichos" (rank).

Eastern hemlock



Above: Paul Wray, Iowa State University,
www.forestryimages.org

Right top: Steve Baskauf <http://tenn.bio.utk.edu/>

Right bottom: Keith Kanoti, Maine Forest Service,
www.forestryimages.org





Keith Kanoti, Maine Forest Service,
www.forestryimages.org

Note the 2
lines of white
stomata on
underside



Richard Webb, Self-employed horticulturist,
www.forestryimages.org



Pennsylvania Department of Conservation and
Natural Resources - Forestry Archive, , Bugwood.org

Eastern hemlock - *Tsuga canadensis*

- **Leaf:** Evergreen, flat, single needles, 1/2 inch long, tapering to a dull point, primarily two-ranked, shiny dark green above, 2 lines of white stomata below.
Flower: Monoecious; males yellow, small, round; females light green at branch tips.
Fruit: Ovoid light brown cone, 3/4 inch long with rounded, entire scales, maturing in early fall.
Twig: Slender, gray-brown in color; buds are very small.
Bark: Initially gray-brown and smooth then turning scaly; older trees are red-brown with wide ridges and furrows; when cut or broken, purple streaks are obvious.
Form: A medium sized tree with a dense, conical crown, fine branches and a drooping terminal shoot reaching up to 80 feet tall, typically a poor natural pruner.
- *Tsuga* Japanese name. *canadensis* of Canada.

Eastern redcedar



USDA Forest Service - Northeastern Area Archive, USDA Forest Service,
www.forestryimages.org



Photographer: Wofford and
Chester
<http://tenn.bio.utk.edu/>

Eastern redcedar - *Juniperus virginiana*

- **Leaf:** Evergreen, very small, with two types of leaves (often on the same tree), scale-like leaves 1/16 inch long, dark green, with 4 sides held tightly to twig and longer (1/4 inch), dark blue-green needle-like leaves that are more common on young trees and fast growing shoots.
- **Flower:** Dioecious; but occasionally Monoecious; males are small, yellow-brown, occurring in large groups; females are light blue-green.
- **Fruit:** Berry-like cones, light green in spring, turning dark blue and glaucous at maturity, about 1/4 inch in diameter, appearing in spring and maturing in the fall.
- **Twig:** Green for several years, covered in scales, later turning brown.
- *Juniperus* Latin name from "junio" (young) and "parere" (to produce) - evergreen. *virginiana* of Virginia.

??Fir, spruce, hemlock, cypress??

- Four sided or diamond shaped needle on a “woody peg” and Cone pendant
 - Spruce
- Does your tree have needles that are attached to the twig with suction cups in a depression, Cone upright
 - Fir
- Does your tree have needles that are flattened and attached to the twig with leaf stalks or stems (petiole),
 - Douglas fir, baldcypress or hemlock

??Fir, spruce, hemlock, cypress??

- Does your tree have needles wider, rounded at ends, green in color, with two white lines on the under surface? If so you probably have a hemlock! The cones are terminal
- Does your tree lose the needles annually (deciduous) and have blue-green to brown, fleshy, woody cones? Are needles narrow, pointed at ends, green in color, without white lines on the under surface? If so you probably have a baldcypress!

Red spruce

Picea rubens



5349

5349070



Keith Kanoti, Maine Forest Service,
www.forestryimages.org

Red spruce

Leaf: Evergreen needles, 1/2 to 5/8 inch long, sharply pointed and four-sided, tending to curve upwards, shiny yellow-green. Each needle borne on a raised, woody peg (sterigma).

Flower: Monoecious; males cylindrical reddish but turning yellow-brown; females purplish green.

Fruit: Chestnut brown ovoid cone, 1 to 1 1/2 inches long, cone scale margins entire; seed disseminated in the fall and cones tend to drop their first winter.

Twig: Orangish brown, finely hairy (may need a hand lens); as with all spruces, needleless twigs covered by short sterigmata (short pegs); buds orange-brown, small with loose scales.

Fun Facts

In recent years red spruce has been experiencing a decline in much of its range which has been linked to severely cold winters and possibly air pollution. The famous acoustic guitar manufacturer, Martin and Company, used primarily red spruce for guitar tops dating from approximately 1900 to the mid 1940's.

Picea Latin "pix" (pitch-producing) from Greek "pissa" (pitch).
rubens blushed with red (buds and bark) - Latin "rubere" (red).

Balsam fir

Abies balsamea

Keith Kanoti, Maine Forest Service,
www.forestryimages.org

Bill Cook, Michigan State
University,
www.forestryimages.org



The Pines – *Pinus* sp.

<http://tenn.bio.utk.edu/vascular/database/vascular-browse-genus-results.asp?GenusName=Pinus>

- Number of needles per fascicle (bundle)
- Cone shape, color, umbo (armed)



Common *Pinus sp* in Tennessee

and on official list

- *Pinus echinata* Common Name:
shortleaf pine
- *Pinus rigida* Common Name:
pitch pine
- *Pinus strobus* Common Name:
eastern white pine
- *Pinus taeda* Common Name:
loblolly pine
- *Pinus virginiana* Common Name:
Virginia pine, scrub pine

Eastern white pine



5 needles per fascicle

Bill Cook, Michigan State University,
www.forestryimages.org



Robert Vidéki, Doronicum Kft.,
www.forestryimages.org

Keith Kanoti, Maine Forest Service,
www.forestryimages.org

Eastern white pine – *Pinus* *strobus*

- **Leaf:** Evergreen needles, 3 to 5 inches long, with five, slender, flexible needles per fascicle; fascicle sheath deciduous, needles appear blue-green because of 3 or more glaucous lines of stomata.
- **Flower:** Monoecious; males cylindrical, yellow, in clusters near branch tips; females light green, tinged in red, at ends of branches.
- **Fruit:** Cones are 4 to 7 inches long, cylindrical, with thick, rounded cone scales, very resinous, borne on a long stalk and maturing in late summer.
- **Twig:** Slender, gray-green to orange-brown in color; buds long, ovoid, reddish brown.
- *Pinus* Latin name for pine from Greek "pitus". *strobus* incense-bearing or a gum-yielding tree (pitchy) or Greek "strobus" (cone).

Loblolly pine



Loblolly pine– *Pinus taeda*

- **Leaf:** Evergreen needles, 6 to 9 inches long, with (usually) three yellow-green needles per fascicle.
- **Flower:** Monoecious; males long cylindrical, red to yellow, in clusters at branch tips; females yellow to purple.
- **Fruit:** Ovoid to cylindrical, 3 to 6 inch red-brown cones; umbo is armed with a short spine, maturing in early fall.
- **Twig:** Orange-brown in color, fine to moderately stout; buds are narrowly ovoid, light reddish brown.
- *Pinus* Latin name for pine from Greek "pitus". *taeda* a torch of pine wood - resinous.

Shortleaf pine



Shortleaf pine – *Pinus*

echinata

- **Leaf:** Evergreen needles, 3 to 5 inches long, two or three (on the same branch), slender and flexible needles per fascicle, dark yellow-green in color, fascicle sheath is persistent.
- **Flower:** Monoecious; males cylindrical, red to yellow, in clumps at ends of twigs; females light green to red and armed.
- **Fruit:** Egg-shaped cone, 2 inches long, somewhat persistent; red to brown in color, umbo is armed with a small prickle, maturing in fall; scales stay relatively flexible.
- **Twig:** Green and purple when young, later turning red-brown.
- *Pinus* Latin name for pine from Greek "pitus". *echinata* Greek "echinos" (a hedgehog, prickly - a reference to the cone scales).

Virginia pine



Virginia pine – *Pinus virginiana*

- **Leaf:** Evergreen needles, 1 1/2 to 3 inches long, with 2 yellow-green, twisted, somewhat divergent needles per fascicle.
- **Flower:** Monoecious; males cylindrical, yellow, near branch tip; females yellow to red, curved prickle present.
- **Fruit:** Conical to ovoid cones are 1 1/2 to 2 1/2 inches long, sessile and persistent, with red-brown scales and an umbo armed with a sharp, needle-like prickle, maturing in the fall.
- **Twig:** Slender, green changing to purple-green with a glaucous bloom; buds gray-brown, narrowly ovoid.
- *Pinus* Latin name for pine from Greek "pitus". *virginiana* of Virginia.

Pitch Pine

Pinus rigida
(state only)



Both photos -Keith Kanoti, Maine Forest Service,
www.forestryimages.org

Pitch Pine

Leaf: Evergreen needles, 2 1/2 to 5 inches long, with three twisted needles per fascicle, yellow-green to green.

Flower: Monoecious; males cylindrical, red to yellow, in large clusters at twig tips; females yellow to red, with small, curved scales.

Fruit: Cones are ovoid, 2 to 4 inches long, light brown in color; umbo is armed with a short, stout prickle; cones are often persistent for many years; maturing in fall.

Twig: Orange-brown and moderately stout; buds narrowly ovoid, light gray-brown.

Bark: Dark and scaly when young, developing red-brown or yellow-brown thick flat plates with deep furrows; sprouts of needles may be present.

Form: Extremely variable; short and poorly formed on poor sites, but can be a straight, medium sized tree reaching 80 feet tall on better sites; epicormic sprouting is common.

Fun Facts

Pitch pine is extremely resistant to fire and injury, and is one of few pines that readily sprouts back after disturbance (especially fires).

Pinus Latin name for pine from Greek "pitus". *rigida* rigid (leaves).

Pine cones



Pitch pine



Eastern white
pine



shortleaf pine



Virginia pine

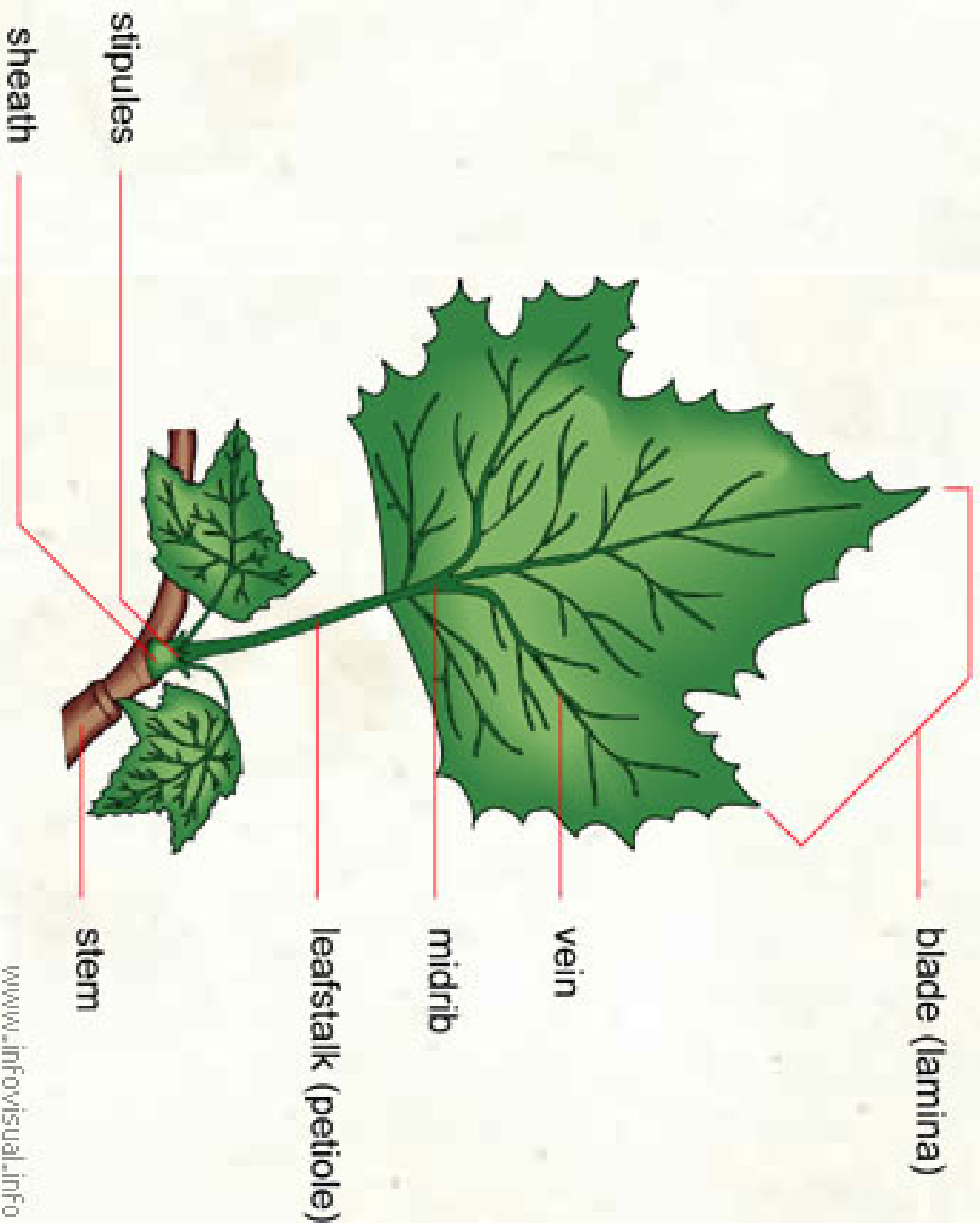


Loblolly pine

State only Needle type

- Arborvitae or northern white cedar
- Red spruce
- Balsam fir
- Pitch pine

STRUCTURE OF A LEAF



Simple versus compound

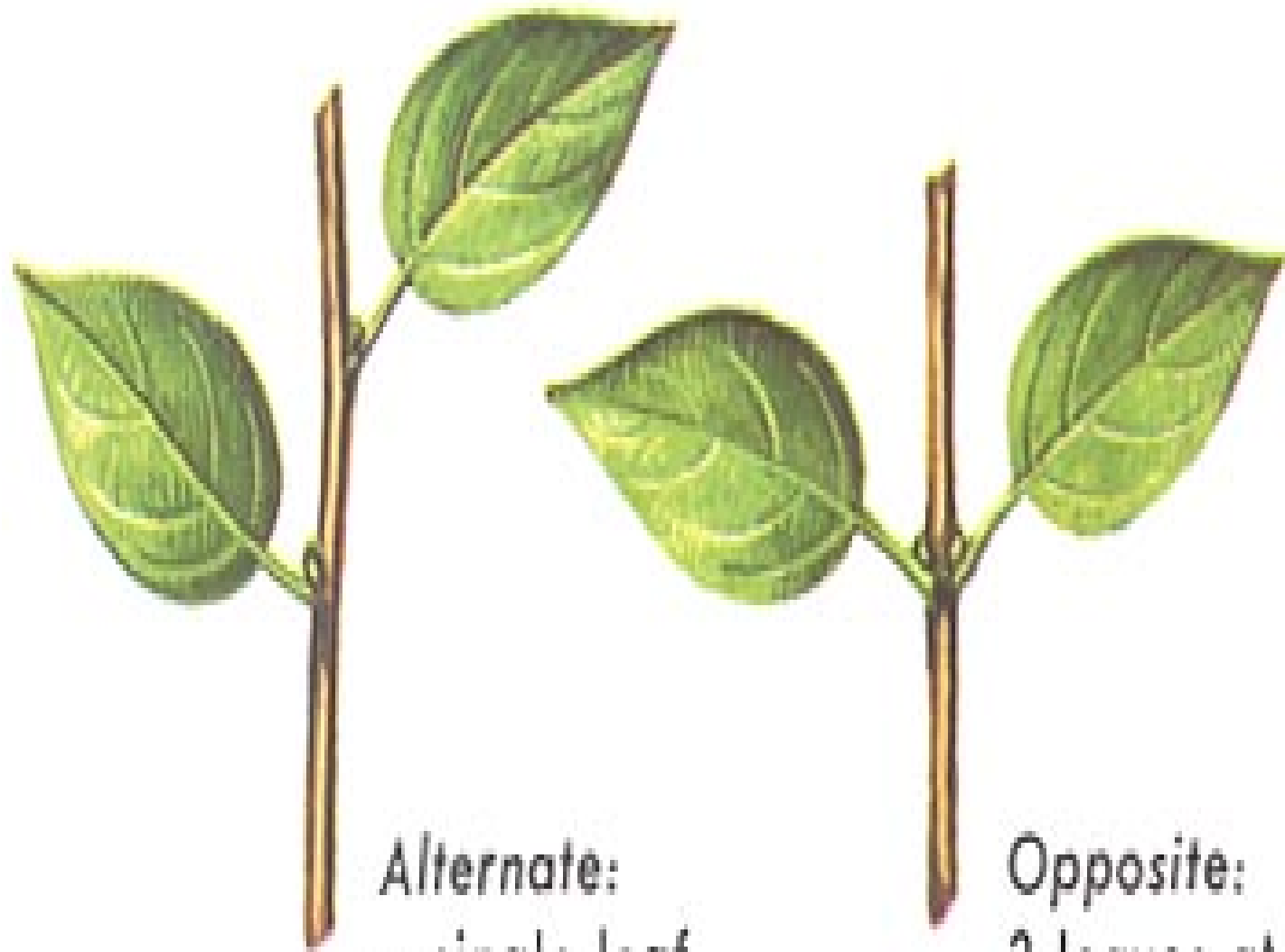


Simple



Compound

Alternate or opposite



Alternate:
a single leaf
at each node

Opposite:
2 leaves at
each node

Shapes

Lobed



Entire



LEAF SHAPES



asymmetrical



acuminate



mucronate



emarginate



ovoid



obovate



cordiform



oblong



spatulate



oval



lanceolate



acicular

LEAF SHAPES



falcate



orbicular



cochleate



subulate



cuneate



linear



sagittate



hastate



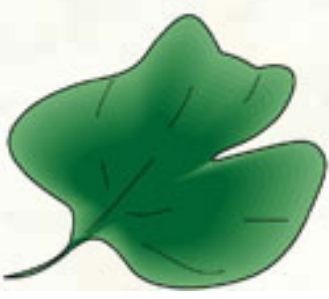
panduriform



lacerate and auriculate



lobate



flabellate

Leaf Margins



*Eastern
cottonwood*

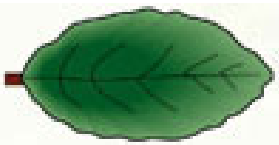
Serrated



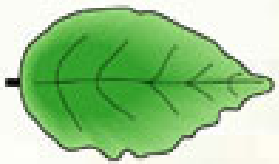
yellow poplar

Smooth

LEAF MARGINS



undulate



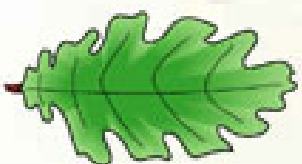
sinuate



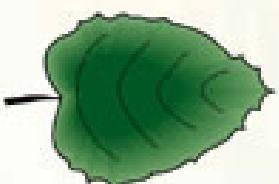
serrate



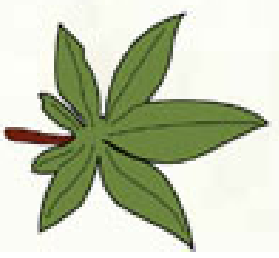
dentate



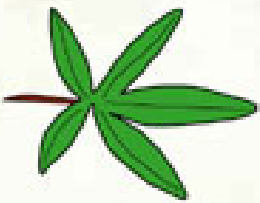
lobate



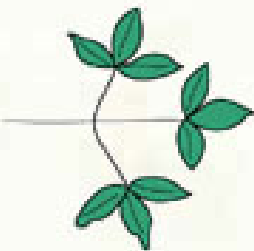
scalloped



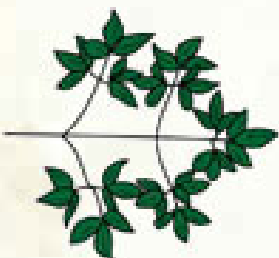
palmate



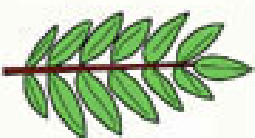
digitate



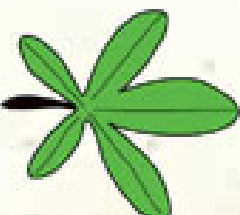
bipinnatisect



tripinnatisect



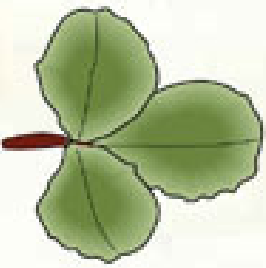
pinnatisect



palmatisect



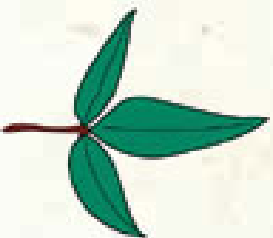
pedate



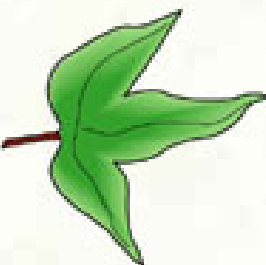
palmatilobate



bipartite



tripartite



palmatipartite



pinnatipartite



pinnatifid

Leaf Base Symmetry

Symmetrical
(opposite sides
proportional)

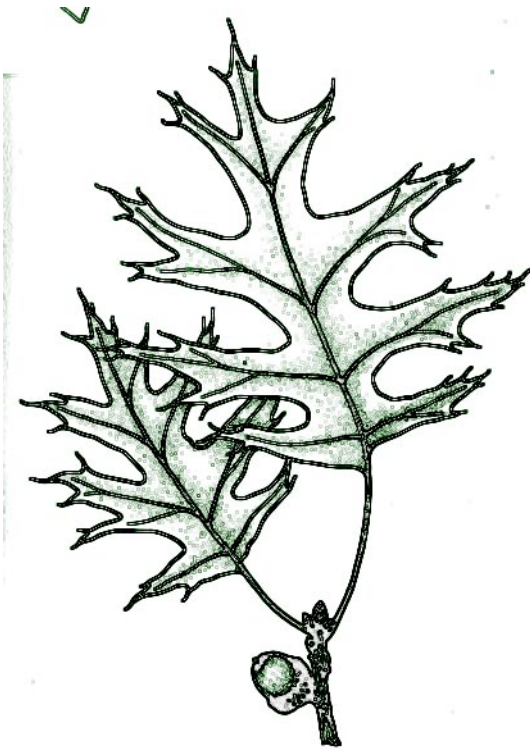


Asymmetrical
(not
proportional)



Bristle – Tipped Lobes

Lobes with
Bristles

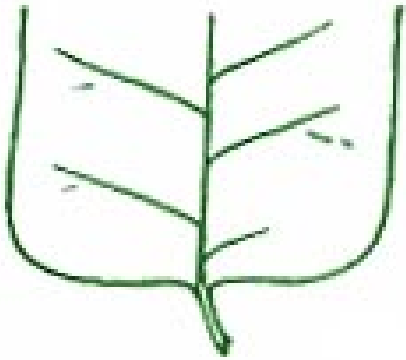


Lobes Smooth

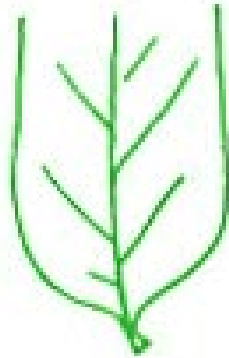


Leaf Base Shape

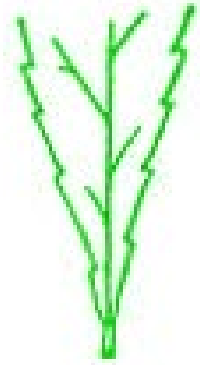
Flattened



Obtuse



Wedge-shaped



Pith Comparison



pith
chambered

Walnut



pith
solid

Hickories

Compound: Palmate or pinnate



Palmate



Pinnate

Compound opposite

- green ash
- boxelder
- buckeyes

Compound opposite Palmate

- Leaflets originate at the same point like a hand
- Buckeyes
 - *Aesculus flava* - yellow buckeye*
 - *Aesculus sylvatica* - painted buckeye
 - *Aesculus pavia* - red buckeye*
 - *Aesculus glabra* - Ohio buckeye

yellow buckeye

Chris Evans, River to River CWMA,
www.forestryimages.org



Buckeye *Aesculus* sp

red buckeye

Nancy Loewenstein, Auburn University,
www.forestryimages.org



Buckeye

Aesculus sp

- **Leaf:** Opposite, palmately compound, 10 to 15 inches long, 5 oval leaflets, each 3 to 7 inches long, sharply serrate, petiole as long as leaflet; dark green above and paler below.
- **Flower:** Monoecious; pale yellow-orange, tubular, with stamens shorter than petals, occur in large showy upright clusters, 4 to 8 inches in length, appear in late spring.
- **Fruit:** Smooth, thick, leathery husks enclosing 1 to 3 smooth chestnut-brown, shiny seeds with a large, lighter brown spot on one side; develop on a stout, terminal stalk and appear as small pear-shaped "potatoes".
- **Twig:** Stout, with a large shield-shaped leaf scar, orangish lenticels; terminal buds are orangish brown, quite large (1/2 to 3/4 inch) with a sharp point; the lateral buds are much smaller.

Compound pinnate opposite

- *Acer negundo* – boxelder*
- *Fraxinus americana* - white ash*
- *Fraxinus angustifolia* - narrowleaf ash
- *Fraxinus pennsylvanica* - green ash*
- *Fraxinus profunda* - pumpkin ash
- *Sambucus nigra* ssp. *canadensis* - American elderberry

Green Ash

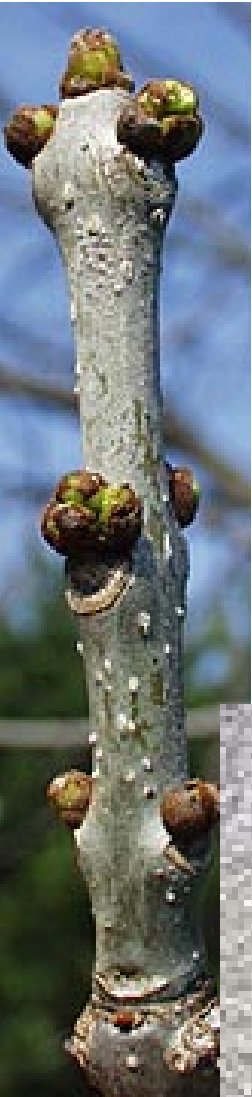
5349055



Keith Kanoti, Maine Forest Service, www.forestryimages.org

Green ash

Fraxinus pennsylvanica



Green ash

- **Leaf:** Opposite, pinnately compound with 7 to 9 serrate leaflets that are lanceolate to elliptical in shape, entire leaf is 6 to 9 inches long, green above and glabrous to silky-pubescent below.
- **Flower:** Dioecious; light green to purplish, both sexes lacking petals, females occurring in loose panicles, males in tighter clusters, appear after the leaves unfold.
- **Fruit:** A single-winged, dry, flattened samara with a slender, thin seed cavity, maturing in autumn and dispersing over winter.
- **Twig:** Stout to medium texture, gray to green-brown and either glabrous or pubescent, depending on variety; leaf scars are semicircular to flat across the top, with lateral buds sitting on top of leaf scar (not down in a notch as with white ash).
- **Bark:** Ashy gray to brown in color, with interlacing corky ridges forming obvious diamonds; older trees may be somewhat scaly.
- **Form:** A medium sized tree to 70 feet tall with a poorly formed bole and an irregular to round crown.

boxelder



Chris Evans, River to River CWMA,
www.forestryimages.org

UGA1330011

Boxelder



Tom DeGomez, University of Arizona,
www.forestryimages.org

Ohio State Weed Lab
Archive, The Ohio State
University,
www.forestryimages.org



1552121

Boxelder – *Acer negundo*

- **Leaf:** Opposite, pinnately compound, 3 to 5 leaflets (sometimes 7), 2 to 4 inches long, margin coarsely serrate or somewhat lobed, shape variable but leaflets often resemble a classic maple leaf, light green above and paler below.
- **Flower:** Dioecious; yellow-green, in drooping racemes; appearing in spring.
- **Fruit:** Paired V-shaped samaras, 1 to 1 1/2 inches long, in drooping clusters, light tan when ripe in fall, persist throughout winter.
- **Twig:** Green to purplish green, moderately stout, leaf scars narrow, meeting in raised points, often covered with a glaucous bloom; buds white and hairy, lateral buds appressed.
- *Acer* Latin name - sharp (leaves or used as lances) or Celtic "ac" (hard). *negundo* Latinized form of Malayan name - leaves resemble genus *Vitex*.

Compound alternate

- Locust
 - *Robinia pseudoacacia* - black locust
- Walnuts
 - *Juglans cinerea* – butternut
 - *Juglans nigra* - black walnut
- Hickories
 - *Carya alba* - mockernut hickory
 - *Carya glabra* - pignut hickory
 - *Carya illinoensis* – pecan
 - *Carya ovata* - shagbark hickory

The Hickories – *Carya* sp.

- *Carya tomentosa* Common Name: mockernut hickory aka *Carya alba*
- *Carya ovata var. ovata* Common Name: shagbark hickory
- *Carya illinoensis* Common Name: pecan
- *Carya glabra* Common Name: pignut hickory, red hickory

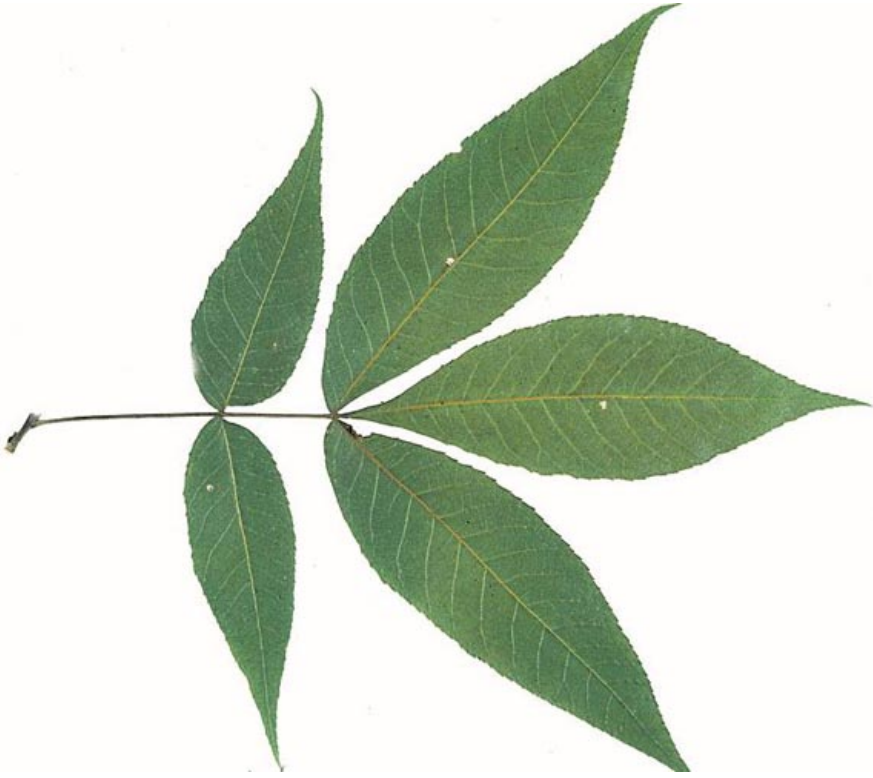
pignut hickory

Chris Evans, River to River CWMA, www.forestryimages.org



UGA2130

Pignut hickory



Pignut hickory – *Carya* *glabra*

- **Leaf:** Alternate, pinnately compound, 8 to 12 inches long, with 5 (sometimes 7) leaflets, leaflets are lanceolate and serrate, rachis slender and glabrous, green above and paler below.
- **Flower:** Monoecious; males are yellow-green, drooping catkins, with three hanging from one stalk, 2 to 3 inches long; females are very short and found in clusters at the end of the branches, both appear in spring.
- **Fruit:** Obovoid to pear-shaped, 1 to 2 inches long, with a thin husk that only partially splits upon maturation; nut is not ribbed, fairly round but flattened, seed is somewhat bitter; ripening in early fall.
- **Twig:** Moderately stout to slender (when compared to the other hickories) and glabrous; leaf scars are 3-lobed to cordate - best described as a "monkey face"; terminal bud is small (1/4 inch), ovate and light brown in color.
- *Carya* Greek "karya or kaura" (walnut -*Juglans regia*). *glabra* glabrous (lacking hair).

Shagbark hickory

Paul Wray, Iowa State University, www.forestryimages.org



ITGA0008



Shagbark hickory

Paul Wray, Iowa State University, www.forestryimages.org



Shagbark hickory – *Carya* *ovata*

- **Leaf:** Alternate, pinnately compound, 8 to 14 inches long with 5 (sometimes 7) leaflets, lateral leaflets are obovate to lanceolate, terminal leaflets are much larger than the laterals, margins serrate and ciliate, rachis stout and mostly glabrous; green above and paler below.
- **Flower:** Monoecious; male flowers are yellow-green catkins, hanging in 3's, 2 to 3 inches long; females are very short, in clusters at the end of branches, both appear spring.
- **Fruit:** Nearly round, 1 1/2 to 2 inches, with a very thick husk; nut is distinctly 4-ribbed, and the seed is sweet and delicious; maturing in fall.
- **Twig:** Stout and usually tomentose, but may be somewhat pubescent near terminal bud, numerous lighter lenticels; leaf scars are raised, 3-lobed to semicircular - best described as a "monkey face"; terminal bud is large, brown, and pubescent, covered with 3 to 4 brown scales, more elongated than other hickories.
- *Carya* Greek "karya or kaura" (walnut -*Juglans regia*). *ovata* ovate or egg-shaped (leaflets).

mockernut hickory

Chris Evans, River to River CWMA,
www.forestryimages.org



UGA



Mockernut hickory – *Carya tomentosa*

- **Leaves:** *Arrangement:* alternate, compound; mostly 7-9 leaflets. *Shape:* lanceolate *Margin:* serrate *Texture:* leaflets, rachis, and petiole are tomentose. *Venation:* parallel
- **Twigs and buds:** Twigs are stout and pubescent. They also have a 3 lobed leaf scar. The terminal buds are long, reddish-brown, and tomentose.
- **Flowers and fruit:** Female and male flowers occur in catkins clusters of 2's and 3's. However, male flowers only occur in 3's. The fruit has a thick dark reddish brown husk and contains a light reddish brown nut.
- *Carya* comes from the Greek name for walnut. *Tomentosa* means with densely matted hairs, referring to the twigs and leaves.

Dr. B. Eugene Wofford. <http://tenn.bio.utk.edu/>

Pecan

erry A. Payne, USDA Agricultural Research
ervice, www.forestryimages.org



UGA1224029

Pecan – *Carya illinoensis*

- **Leaf:** Alternate, pinnately compound with 9 to 15 finely serrate and often curved leaflets, 12 to 18 inches long.
Flower: Monecious; male flowers in hanging, yellow-green catkins, often in pairs of three (4 to 5 inches long); females are small and yellowish green, 4-angled.
Fruit: Large, oblong, brown, splotched with black, thin shelled nuts, 1 1/2 to 2 inches long, husks are thin, usually occur in clusters on trees, mature in fall.
Twig: Moderately stout, light brown, fuzzy (particularly when young); leaf scars large and three lobed; buds are yellowish brown to brown, hairy, with terminal buds 1/4 to 1/2 inch long.

black walnut

Paul Wray, Iowa State University,
www.forestryimages.org



Robert Vidéki, Doronicum Kft.,
www.forestryimages.org

Black walnut – *Juglans nigra*

- **Leaf:** Alternate, pinnately compound, 12 to 24 inches long with 10 to 24 leaflets (poorly formed or missing terminal leaflet), leaflets are ovate-lanceolate, finely serrate, and 3 to 3 1/2 inches long, rachis is stout and somewhat pubescent; yellow-green to green above, slightly paler below.
- **Flower:** Monoecious; males are single-stemmed catkins, 2 1/2 to 5 1/2 inches long; females on short spikes near twig end, yellow-green in color, appearing in late spring.
- **Fruit:** Round, 2 to 2 1/2 inches across, with a thick, green indehiscent husk. The husk contains an irregularly furrowed, hard nut that contains sweet, oily meat (edible), mature in late summer to fall.
- **Twig:** Stout, light brown, with a buff-colored chambered pith; buds are tan, and large with a few pubescent scales; leaf scars are 3-lobed, resembling a "monkey face".
- **Fun Facts:** The wood of black walnut is dark brown in color and is easily worked. The nuts are said to be superior in flavor to other walnuts and are used primarily for baked goods and ice cream. The shells of black walnut have many uses including an abrasive cleaning agent for jet engines, filler for dynamite, a filter agent in smokestacks, and a flour-like carrying agent for insecticides. Black walnut is known to exude from its roots an allelopathic chemical called Juglone which is highly toxic to other plants.
- Juglans Latin name for Juglans regia Latin "jovis" (Jupiter) and "glans" (nut). nigra black (bark).

Butternut or White walnut



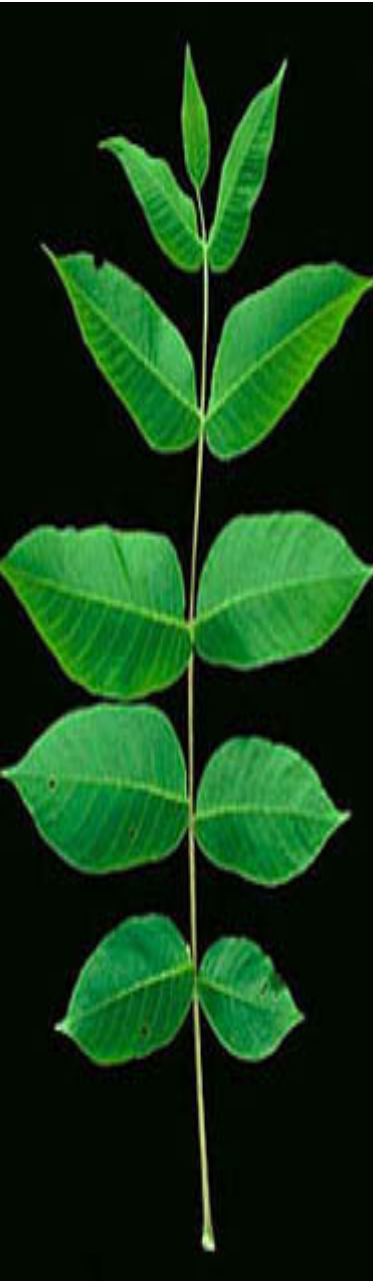
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Butternut – *Juglans cinerea*

- **Leaf:** Alternate, pinnately compound, 15 to 25 inches long, with 11 to 17 oblong-lanceolate leaflets with serrate margins; rachis is stout and pubescent with a well developed terminal leaflet; green above and paler below.
- **Flower:** Monoecious; male flowers are single-stemmed, yellow-green catkins, 2 1/2 to 5 1/2 inches long; females are on a short spike near the end of the twig, green-yellow in color, appear in mid to late summer.
- **Fruit:** Oblong (lemon shaped), with a yellow-green sticky indehiscent husk; husk contains an irregularly-ribbed nut containing sweet, oily meat; mature in late summer.
- **Twig:** Stout, may be somewhat pubescent, yellow-brown to gray, with a chambered pith that is very dark brown in color; buds are large and covered with a few light colored pubescent scales; leaf scars are 3-lobed, resembling a "monkey face"; a tuft of pubescence is present above the leaf scar resembling an "eyebrow".

butternut (left),
black walnut
(right)



black locust
Robinia
pseudoacacia L.



Steven J. Baskauf
<http://www.cas.vanderbilt.edu/bioimages/frame.htm>

Robert Vidéki, Doronicum Kft.,
www.forestryimages.org

Black locust – *Robinia*

pseudoacacia

- **Leaf:** Alternate, pinnately compound, with 7 to 19 leaflets, 8 to 14 inches long. Leaflets are oval, one inch long, with entire margins. Leaves resemble sprigs of grapes; green above and paler below.
- **Flower:** Monoecious; perfect, showy and fragrant, white, 1 inch long and pea-like, borne in long (5 inches) hanging clusters, appear in mid to late spring.
- **Fruit:** Flattened legume, light brown, 2 to 4 inches long; containing 4 to 8 kidney-shaped, smooth, red-brown seeds, ripen in the fall.
- **Twig:** Zigzag, somewhat stout and angular, red-brown in color, numerous lighter lenticels. Paired spines at each leaf scar (often absent on older or slow growing twigs); buds are submerged beneath the leaf scar.
- **Fun facts:** Rhizobial root nodules allow trees to "fix" atmospheric nitrogen into plant usable form. Black locust flowers are used in honey production. Locust borers allow heartrot fungi to enter trunks and the resultant fungal bodies are often used as 'artist conks'. Black locust is excellent firewood.
Robinia after Jean Robin, French Herbalist.
pseudoacacia false acacia, Greek "akakia" (the Egyptian thorn-tree) and "akis" (thorn).

Simple opposite

- Red maple
- Sugar maple
- Silver maple
- flowering dogwood

flowering dogwood



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Flowering dogwood – *Cornus florida*

- **Leaf:** Opposite, simple, 3 to 5 inches long, oval in shape with an entire or slightly wavy margin, arcuately veined, green above and slightly paler below.
- **Flower:** Monoecious; very small and inconspicuous tight cluster, but surrounded by 4 very showy, large, white (occasionally pink) bracts, 2 inches in diameter, appearing in mid-spring.
- **Fruit:** A shiny, oval red drupe, 1/4 to 1/2 inch long, in clusters of 3 to 5, maturing in fall.
- **Twig:** Slender, green or purple (purple on sunlit side), later turning gray, often with a glaucous bloom. The terminal flower buds are clove-shaped, vegetative buds resemble a dull cat claw.
- Flowering dogwood's red fruits, although relished by wildlife, are poisonous to humans. Powderized bark and small twigs were onced used as toothpaste.
- Cornus the Latin name for Cornus mas from "cornu" (hard - for the wood). florida flowering Latin "flos" (flower).

Sugar maple



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Sugar maple – *Acer* *saccharum*

- **Leaf:** Opposite, simple and palmately veined, 3 to 6 inches long, 5 delicately rounded lobes, entire margin; green above, paler below.
- **Flower:** Light yellow-green, small, clustered, hanging from a long, slender (1 to 3 inch) stem, appearing with or slightly before the leaves in early spring.
- **Fruit:** Two-winged horseshoe-shaped samaras about 1 inch long, appearing in clusters, brown when mature in the fall.
- **Twig:** Brown, slender and shiny with lighter lenticels; terminal buds brown, very sharp pointed, with tight scales.
- *Acer* Latin name - sharp (leaves or used as lances) or Celtic "ac" (hard).
saccharum name for sugar cane - Greek "sakcharon" (sweet or sugar)

Red maple



UGA1219022



UGA0008374

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Red Maple - *Acer rubrum*

- **Leaf:** Opposite, simple, 3 to 5 palmate lobes with serrated margin, sinuses relatively shallow (but highly variable), 2 to 4 inches long; green above, whitened and sometimes glaucous or hairy beneath.
- **Flower:** Attractive but small, occur in hanging clusters, usually bright red but occasionally yellow, appear in early spring, usually before leaves.
- **Fruit:** Clusters of 1/2 to 3/4 inch long samaras with slightly divergent wings, on long slender stems. Light brown and often reddish, ripen in late spring and early summer.
- **Twig:** Reddish and lustrous with small lenticels, buds usually blunt, green or reddish (fall and winter) with several loose scales usually present, leaf scars V-shaped, 3 bundle scars, lateral buds slightly stalked, may be collateral buds present.\
- *Acer* Latin name - sharp (leaves or used as lances) or Celtic "ac" (hard). *rubrum* red.

Silver maple



Keith Kanoti, Maine Forest Service,
www.forestryimages.org

Paul Wray, Iowa State University,
www.forestryimages.org



5350044

Silver maple – *Acer saccharinum*

- **Leaf:** Opposite, simple with 5 deeply palmate sinuses, lobe margins coarsely serrate, 2 1/2 to 5 inches long; light green above, pale, silvery white below.
- **Flower:** Monoecious; greenish to reddish flowers appear in dense clusters in early spring long before leaves.
- **Fruit:** Samara, largest of any native maple, divergent wings 1 1/2 to 2 1/2 inches long, germinate as soon as released, mature in late spring.
- **Twig:** Similar to red maple but stouter and often more chestnut-brown in color, unpleasant odor when crushed; buds reddish brown with large scales, flower buds often in conspicuous dense clusters.
- *Acer* Latin name - sharp (leaves or used as lances) or Celtic "ac" (hard). *saccharinum* sugary sap - Greek "sakcharon" (sweet or sugar).

Simple alternate

- Beech
- River birch
- Black cherry
- Cottonwood
- American elm
- Blackgum
- Sweetgum
- Hackberry
- American holly
- Red mulberry
- Persimmon
- Yellow-poplar
- Sassafras
- Sycamore
- Sourwood
- Willow
- Black oak
- Chestnut oak
- Northern red oak
- Post oak
- Scarlet oak
- Southern red oak
- white oak
- Sweet Birch (state only)
- Basswood (state only)
- Cucumbertree (state only)
- water oak (state only)

Black Cherry



5399808



UGA0008481

Paul Wray, Iowa State University,
www.forestryimages.org

Robert Vidéki, Doronicum Kft.,
www.forestryimages.org

Black cherry – *Prunus serotina*

- **Leaf:** Alternate, simple, 2 to 5 inches long, oblong to lance-shaped, finely serrated, very small inconspicuous glands on petiole, dark green and lustrous above, paler below; usually with a dense yellowish-brown, sometimes white pubescence along mid-rib.
- **Flower:** Small white flowers in hanging, narrow clusters 4 to 6 inches long, appearing in late spring.
- **Fruit:** Dark purple round drupe, almost black when ripe, 1/3 inch in diameter with a bitter-sweet taste; matures in late summer.
- **Twig:** Slender, reddish brown, sometimes covered in gray epidermis, pronounced bitter almond odor and taste; buds are very small (1/5 inch), covered in several glossy, reddish brown to greenish scales. Leaf scars are small and semicircular with 3 bundle scars.



American elm



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Bill Cook, Michigan State University,
www.forestryimages.org



American elm – *Ulmus americana*

- **Leaf:** Alternate, simple, ovate to oblong, 3 to 5 inches long, 1 to 3 inches wide, margin coarsely and sharply doubly serrate, base conspicuously inequilateral, upper surface green and glabrous or slightly scabrous, paler and downy beneath.
- **Flower:** Monoecious; small, in drooping clusters of 3 to 5, appear in early spring before leaf buds open.
- **Fruit:** Rounded, flat, pappery, wafer-like samaras, 3/8 to 1/2 inch across, deeply notched at apex, hairless except for margin; ripen in spring.
- **Twig:** Slender, glabrous, slightly zigzag, reddish brown; buds ovate, over 1/4 inch long, reddish brown with darker edged scales, often placed a little to one side of the twig.

blackgum *Nyssa sylvatica*



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Blackgum – *Nyssa sylvatica*

- **Leaf:** Alternate, simple, pinnately veined, oblong to obovate in shape with an entire margin, 3 to 5 inches long, occasionally shallow lobes (or coarse teeth) near tip, dark green above and slightly paler below.
- **Flower:** Primarily Dioecious; not showy, light green in color, in clusters hanging from slender stalks, appearing with the leaves.
- **Fruit:** A dark, purplish blue drupe, 1/2 inch long, with a fleshy coating surrounding a ribbed pit, ripen in late summer and fall.
- **Fun facts:** Some taxonomists place the genus *Nyssa* in the Cornaceae (dogwood) family. Blackgum is very adaptable, and competes well in swampy areas and dry uplands. Blackgum's shiny leaves are amongst the first to break bud in the spring, and some of the first to turn brilliant red in the fall. The intense fall foliage lends ornamental value.
Nyssa Greek "Nysa" - a water nymph.
sylvatica of the woods - Latin "silva" (forest).

sweetgum *Liquidambar styraciflua*

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Ken McFarland <http://tenn.bio.utk.edu/vascular/>



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Sweetgum – *liquidambar* *styraciflua*

- **Leaf:** Alternate, simple, palmately veined, orbicular, 4 to 6 inches across with 5 to 7 lobes (look like stars), and a finely serrate margin. Shiny green above and pubescent in the axils of the veins below, fragrant when crushed.
- **Flower:** Monoecious; female borne on a slender stalk, capped with a globose head, male flowers borne on an upright raceme; both are small, bright yellow-green (tinged with red) and not showy, appear in early to mid-spring.
- **Fruit:** Easy to identify spiny "gumballs", woody brown spherical cluster of capsules, 1 to 1 1/2 inches in diameter with openings in the surface that release 2 seeds from each capsule; maturing in fall.
- **Fun facts:** Sweetgum's name comes from the hardened clumps of sap that are exuded from the wounds. Sweetgum is a relative of witchhazel, the medicinal plant common in moist woodland understories. A horticultural variety exists that has rounded leaf tips and does not produce fruit. Liquidambar Latin "liquidus" (liquid) and "ambar" (amber), referring to resin containing storax. *styraciflua* flowing with *styrax* (an aromatic balsam).

Eastern cottonwood



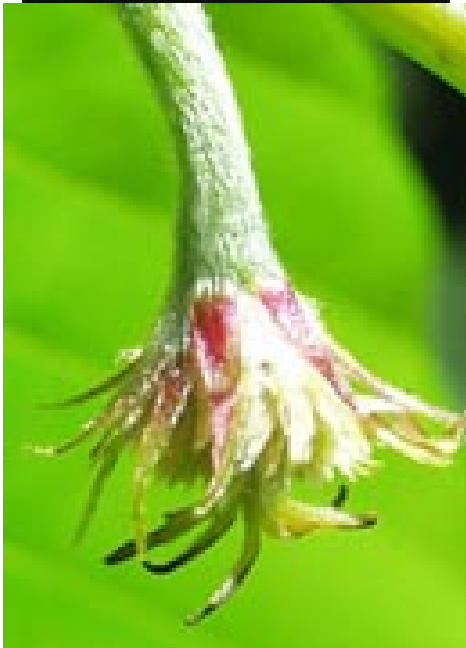
Populus deltoides

Eastern cottonwood

- **Leaf:** Alternate, simple, pinnately veined, 3 to 6 inches long, triangular (deltoid) in shape with a crenate/serrate margin. The petiole is flattened and glands are present at the top of the petiole.
- **Flower:** Dioecious; male and female as pendulous catkins, appearing before the leaves.
- **Fruit:** Cottony seeds, 1/4 inch long borne in a dehiscent capsule, maturing over summer.
- **Twig:** Stout, somewhat angled and yellowish; buds are 3/4 inch long, covered with several brown, resinous scales. Has a bitter aspirin taste.
- **Bark:** Smooth, gray to yellow-green when young. Later turning gray with thick ridges and deep furrows.
- **Form:** A large tree with a clear bole and an open spreading crown resulting in a somewhat vase-shaped form.
- *Populus* Latin name. *deltoides* triangular (leaf).

American beech

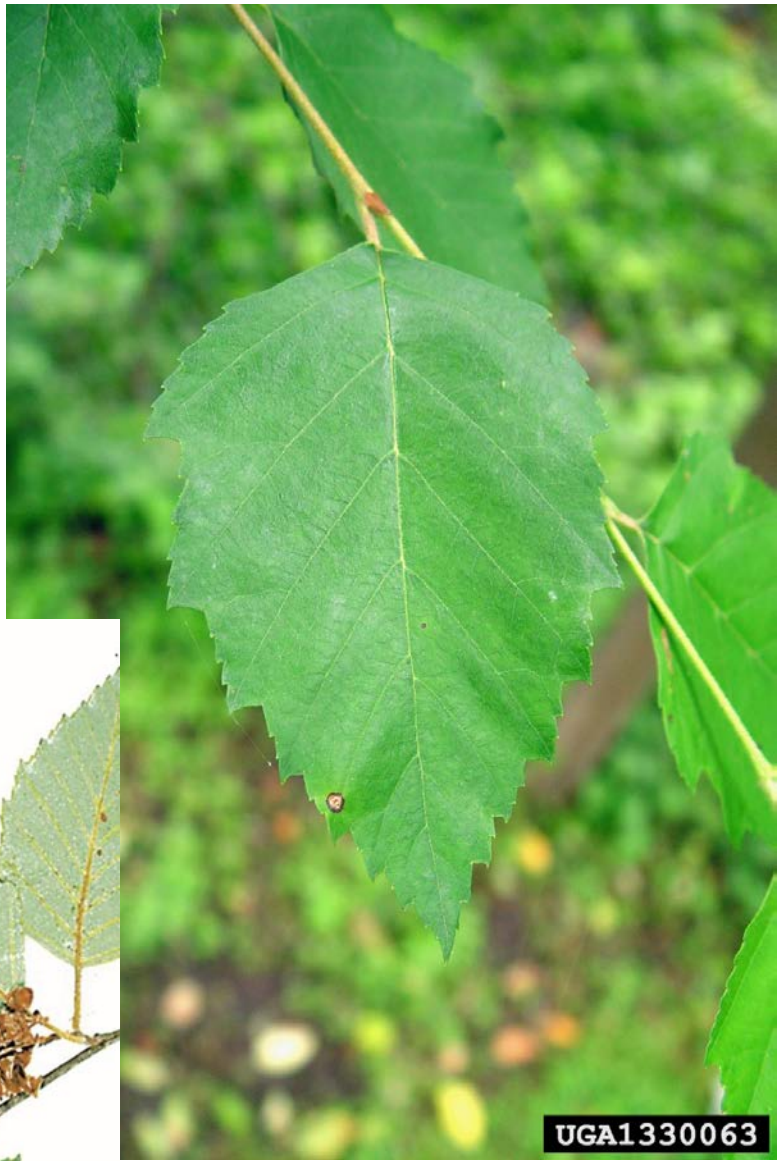
Fagus grandifolia



American beech

- **Leaf:** Alternate, simple, elliptical to oblong-ovate, 2 1/2 to 5 1/2 inches long, pinnately-veined, 11-14 pairs of veins, with each vein ending in a sharp distinct tooth, shiny green above, very waxy and smooth, slightly paler below.
- **Flower:** Monoecious; male flowers borne on globose heads hanging from a slender 1 inch stalk, female flowers borne on shorter spikes, appearing just after leaves in the spring.
- **Fruit:** Nuts are irregularly triangular, shiny brown and edible, found in pairs within a woody husk covered with spines, 1/2 to 3/4 inch long, maturing in the fall.
- **Twig:** Very slender, zigzag, light brown in color; buds are long (3/4 inch), light brown, and slender, covered with overlapping scales (best described as "cigar-shaped"), widely divergent from the stems, almost looking like long thorns.
- **Bark:** The bark is smooth, thin, and gray in color even on the largest stems. Beech bark diseases severely deforms the smooth bark.
- **Form:** A medium to large tree up to 100 feet tall with a rounded crown. Often found in thickets produced by root suckering. Old trees may be surrounded by a ring of young beech.
- **Fun Facts**
- Beech is very shade tolerant, and assumes dominance on many northern hardwood sites in association with sugar maple and yellow birch. Older, large trees are often hollow and were once used commonly as culverts in road building.
- *Fagus* Latin name from Greek "phagein" (to eat - edible nuts).
grandifolia grand foliage.

River birch



river birch

Betula nigra

- **Leaf:** Alternate, simple, pinnately-veined, rhombic to ovate, 1 1/2 to 3 inches long, conspicuously doubly serrate, with a wedge-shaped base, green above, paler and fuzzy below.
- **Flower:** Monoecious; preformed, reddish green, male catkins near the end of the twig, 2 to 3 inches long; female catkins upright, 1/4 to 1/2 inch long, light green, appear or elongate (males) in mid-spring.
- **Fruit:** Cone-like, aggregate, 1 to 1 1/2 inches long, with many hairy scales, reddish brown, containing many tiny, 3-winged seeds, ripen and break apart in the fall.
- **Twig:** Slender, orangish brown in color, smooth or slightly pubescent, with the terminal bud absent. Lateral buds may be slightly pubescent. No wintergreen odor when cut.

hackberry *Celtis occidentalis* L

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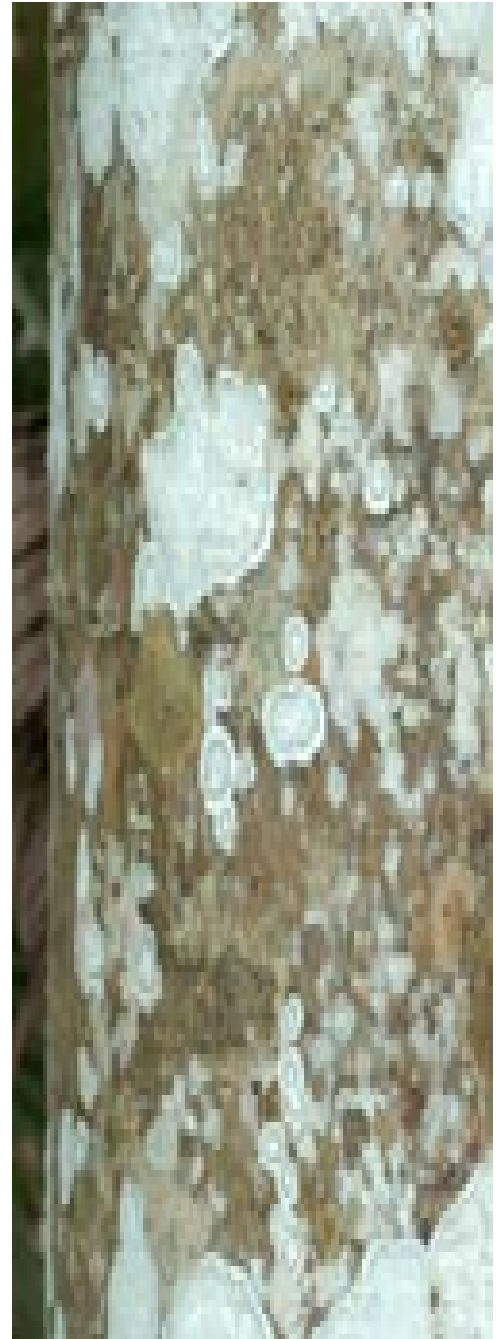
Paul Wray, Iowa State University,
www.forestryimages.org

Hackberry – *Celtis*

occidentalis

- **Leaf:** Alternate, simple, ovate, 2 to 5 inches long, serrated margin, pinnately veined, with acuminate tip and an inequilateral base, three distinct veins originate from base, maybe hairy or scruffy, green above and paler and somewhat pubescent below.
- **Flower:** Monoecious; very small (1/8 inch), light green, produced on stalks from new leaf axils. Each flower with a 4 or 5 lobed calyx, appearing in spring.
- **Fruit:** Round drupe, 1/4 to 3/8 inch in diameter, turning orange-red to dark purple when ripe, flesh is thin and quite dry but edible and sweet, enclosing a large pit, maturing in early fall.
- **Twig:** Slender, zigzag, light red-brown with numerous lighter lenticels; terminal bud is lacking, but a pseudoterminal bud is present. Lateral buds are small, tan, triangular, and appressed, pith is often chambered at the nodes.

sugarberry *Celtis laevigata*



sugarberry *Celtis laevigata*

- **Leaf:** Alternate, simple, pinnately veined, 2 to 5 inches long, 1 to 2 inches wide, long acuminate tip, only upper half of leaf or less serrated (maybe entire), three distinct veins meet at the inequilateral base.
- **Flower:** Very small (1/8 inch), greenish-white, produced on stalks near twig, appearing in spring.
- **Fruit:** Fleshy, globose, 1/4 to 3/8 inch in diameter, orangish red turning purple when ripe, stalks short, maturing in fall.
- **Twig:** Slender, zigzag, reddish brown, speckled with lighter lenticels, lateral buds are tightly appressed and triangular in shape, pith usually chambered at nodes.
- **Bark:** Gray to light brown, smooth with corky "warty" patches, does not develop ridges, as does hackberry, although it is highly variable.
- **Form:** Medium size tree to 80 feet tall, several feet in diameter, broad crown in open with drooping branches.

American holly *Ilex opaca* Ait.



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American Holly – *Ilex opaca*

- **Leaf:** Alternate, simple, evergreen, elliptical, 2 to 4 inches long, spiny toothed margin, thickened and leathery, shiny dark green above, much paler below.
- **Flower:** Dioecious; dull green-white, male flowers on 3 to 7 flowered cymes, female flowers are solitary with a pleasant odor, appearing in late spring.
- **Fruit:** Berry-like drupe, red, rarely yellow when ripe, 1/4 inch in diameter, containing ribbed nutlets; maturing in fall and persisting on tree into winter.
- **Twig:** Slender, with rust-colored pubescence; buds small reddish brown, pointed

red mulberry *Morus rubra*



Red mulberry – *Morus rubra*

- **Leaf:** Alternate, simple, broadly ovate to roughly orbicular, 3 to 5 inches long, serrate margin, highly variable in that they may have no lobes or be highly dissected into lobes; green above with a rough scabrous texture, paler and fuzzy below.
- **Flower:** Normally Dioecious; small, pale green; male flowers are hanging catkins, 1 to 2 inches long; females are 1 inch long catkins, both appearing in late spring.
- **Fruit:** Resembling blackberries, cylindrical, 1 to 1 1/4 inches long, fleshy multiples of drupes, each containing a small seed, maturing in summer.
- **Twig:** Slender, zigzag, green changing to red-brown, sometimes pubescent; buds are covered with brown-margined overlapping scales; leaf scars shield-shaped and somewhat sunken; silvery-white filaments present when broken.

common persimmon
Diospyros virginiana



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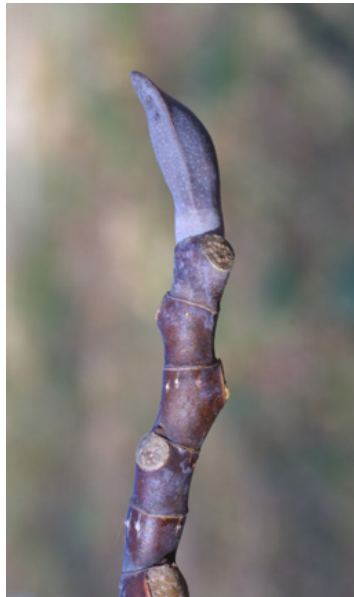


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Common persimmon – *Diospyros virginiana*

- **Leaf:** Alternate, simple, oblong to oval, 2 1/2 to 5 inches long, pinnately-veined, margin entire, lustrous green above and paler or whitened below.
- **Flower:** Usually Dioecious; both white to greenish-white and about 1/2 inch long; male flowers in 3's; female flowers solitary and urn-shaped, appear in late spring and early summer.
- **Fruit:** A plum-like berry that is green before ripening, turning orange to black when ripe, 3/4 to 2 inches in diameter, leafy bracts on top of fruit. The fruit is very astringent and mouth numbing when green, sweet and edible when ripe after a hard freeze; matures in mid to late fall.
- **Twig:** Slender, light brown to gray, maybe scabrous or pubescent; no true terminal bud and twig scar is often very prominent, buds are dark red to black with 2 bud scales, triangular in shape, appressed; leaf scar has one, oval vascular bundle trace.
- **Fun facts:** Several cultivars of persimmon are available, selected and propagated for greater fruit size and quality. Fruits must be eaten after the first frost or they will cause severe mouth puckering. Persimmon flowers are useful in the production of honey.
Diospyros Greek "dios" (divine) and "pyros" (wheat) referring to the edible fruit. *virginiana* of Virginia.

yellow-poplar



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Yellow-poplar – *Liriodendron tulipifera*

- **Leaf:** Alternate, simple, palmately veined, orbicular, 4-lobed with an entire margin, 4 to 8 inches long, notched to flat top. Somewhat shaped like a tulip, light green to green.
- **Flower:** Monoecious; perfect, showy, resembling a large tulip, but high in the tree, 2 1/2 inches long, with yellow-green petals and an orange corolla, appearing in late spring to early summer.
- **Fruit:** An oblong (cone-like) aggregate of samaras (2 inches long), deciduous at maturity; each samara is 1-winged, 1 1/2 inches long, and curved upwards at seed cavity (resembling the front keel of a boat); maturing August to October and disseminating through late fall and winter; base whorls of samaras persist on fruit into following spring and resemble wooden flowers high in the tree.
- **Twig:** Red-brown in color, often with a shiny appearance or a waxy bloom. Stipules are large and encircle the twig; buds are elongated and valvate, resembling a "duck bill". Twigs have a sweet, spicy odor when broken.
- **Fun facts:** Yellow-poplar is tallest hardwood in North America. The tree's tulip-shaped greenish-yellow and orange striped flowers are very attractive and worth a second look. It is also a high nectar yielding honey tree. *Liriodendron* Greek "leiron" (lily) and "dendron" (tree). *tulipifera* tulip-bearing.

sassafras



UGA1330072

Sassafras – *Sassafras* *albidum*

- **Leaf:** Alternate, simple, pinnately veined, ovate to elliptical, entire, 3 to 6 inches long with 1 to 3 lobes; the 2-lobed leaf resembles a mitten, the 3-lobed leaf resembles a trident; green above and below and fragrant when crushed.
- **Flower:** Dioecious; small but quite showy, both male and females are bright yellow-green, borne in 2 inch racemes appearing in early to mid-spring.
- **Fruit:** Dark shiny blue, ovoid, fleshy drupes (1/3 inch long) that are borne in a red cup attached to a red stalks, held upright, maturing late summer.
- **Twig:** Slender, green and sometimes pubescent, with a spicy-sweet aroma when broken; buds are 1/4 inch long and green; twigs from young plants displayed at a uniform 60 degree angle from main stem.
- **Fun facts:** Sassafras root was one of the earliest new world exports - it was used to perfume soaps and make tea. Native Americans used to use sassafras trees for dug out canoes. Large, extended doses of sassafras are not recommended; it is a known carcinogen.
Sassafras American Indian name or from Spanish "saxafrax". *albidum* white (leaf undersides).

sourwood



UGA15

Chris Evans, River to River CWMA,
www.forestryimages.org

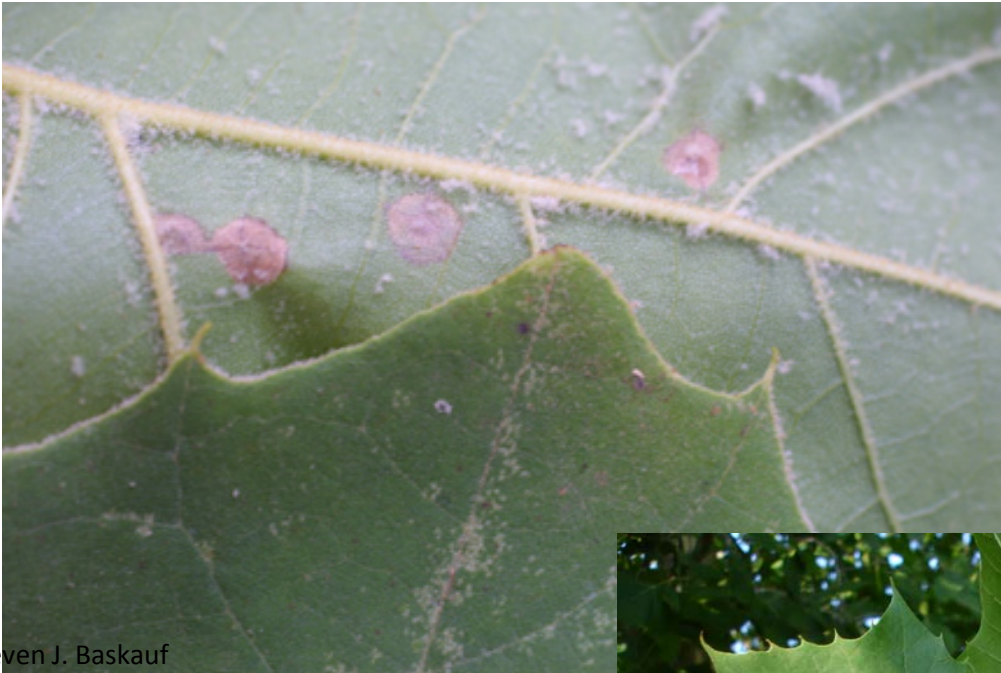
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Sourwood – *Oxydendrum arboreum*

- **Leaf:** Alternate, simple, elliptical to lanceolate, 4 to 7 inches long, very finely serrate to ciliate, very slight pubescence on the mid-vein below, green above and paler below. A sour taste is obvious when the leaf is chewed
- **Flower:** Monoecious; white, 1/4 inch long, urn-shaped, borne on drooping panicles, reminiscent of lily-of-the-valley flowers, appear in mid-summer.
- **Fruit:** Dehiscent, 5-valved capsules borne on panicles. Capsules are dry when mature in fall and release the very tiny, 2-winged seeds.
- **Twig:** Olive green, changing to red, with buds that are small, round and oppressed (almost absent); leaf scars are elevated with one bundle scar.

American sycamore

Allen Bridgman, South Carolina Department of
Natural Resources, www.forestryimages.org



Steven J. Baskauf
<http://www.cas.vanderbilt.edu/bioimages/frame.htm>



UGA5191080

Sycamore – *Plantanus* *occidentalis*

- **Leaf:** Alternate, simple, palmately veined, 4 to 8 inches wide, ovate in shape, with three to five lobes, margins coarsely toothed, petiole bases encircle and enclose the buds, veins may be pubescent below.
- **Flower:** Monoecious; imperfect, both male and females are very small and appear in dense round clusters, typically a single cluster to a stalk, appearing with the leaves.
- **Fruit:** A spherical multiple of achenes borne on a 3 to 6 inch stalk. Each seed is tiny, winged, and 1/2 inch long; maturing in November, disseminating in late winter.
- **Twig:** Obviously zigzag, quite stout and orange-brown in color; leaf scar surrounds the bud and the stipule scar surrounds the twig; terminal bud is absent; lateral buds are reddish, resinous, with a single, cap-like scale.
- **Fun facts:** Sycamore produces biomass more rapidly than most other trees and develops into one of the most massive trees in the East. Platanus Greek "platanos" (broad or flat). occidentalis western - Latin "occidere" (to set, as the sun).

Salix nigra
Black willow

Willow



Willow - *Salix* sp. (*Salix nigra*)

- **Leaf:** Alternate, simple, pinnately veined, lanceolate in shape, 3 to 6 inches long, with a finely serrate margin. Leaves are dark and shiny above, light green below.
Flower: Dioecious; flowers are tiny, green, borne on catkins, 1 to 3 inches long, early summer.
Fruit: Cone-shaped capsules that contain many small, cottony seeds, borne on catkins; capsules split at maturity, mid summer.
Twig: Slender, orange-brown in color, with a bitter aspirin taste; buds are small and appressed, covered by one bud scale, the terminal bud absent; stipules/scars are obvious.
Bark: Brown to gray-black, with thick, somewhat scaly ridges and deep furrows.
Form: A small to medium sized tree that can develop a massive trunk with a spreading, irregular crown. Black willows are often affected by crown gall, and witches brooms and trunk sprouting are common.

Sweet birch *Betula lenta*



State only

Sweet birch

Leaf: Alternate, simple, pinnately-veined, ovate, with an acute tip and cordate base, singly or irregularly doubly, sharply serrate margins, 2 to 4 inches long, petiole is stout and pubescent, dark shiny green above, paler below.

Flower: Monoecious; preformed, green male catkins near the end of the twig, 3/4 to 1 inch long; females are upright, 1/2 to 3/4 inch long, green tinged in red, appear or elongate (males) in mid-spring.

Fruit: Cone-like aggregate, brown, 1 to 1 1/2 inches long, scales hairless or nearly so, containing very small 2-winged nutlets, ripen and break apart in late summer and fall.

Twig: Twigs are slender, reddish brown and lenticellate with a wintergreen smell when cut. On older trees, spur shoots are apparent. Terminal buds are absent, lateral buds two toned, green and brown.

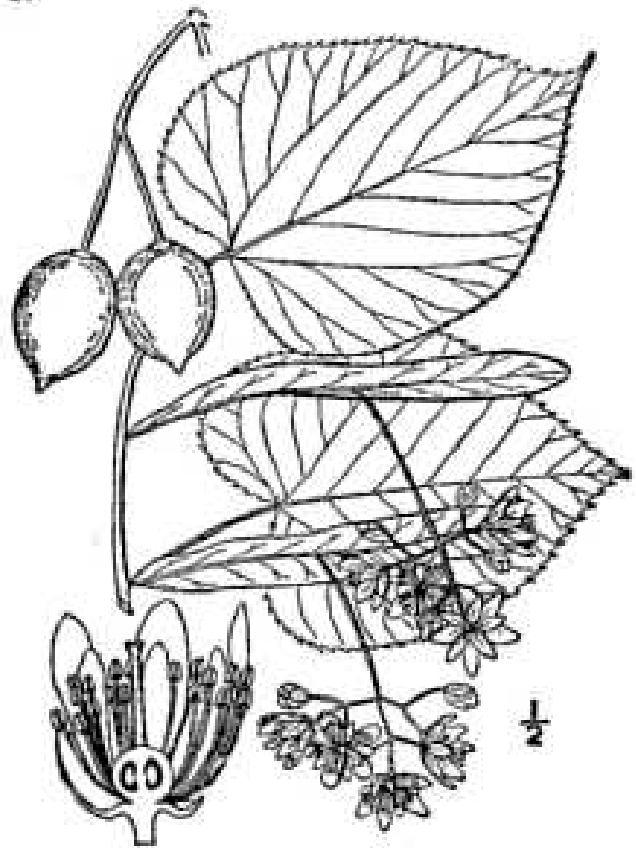
Fun facts

Trees can be tapped in spring and the sap fermented to make birch beer. Early settlers fancied the supple spring growth of sweet birch for use "flossing" between sporadic remnants of teeth.

Betula Latin (pitch - bitumen is distilled from the bark or Sanskrit "bhurja" (to shine" (bark))). *lenta*

American basswood

Tilia americana



State only

American Basswood

Leaf: Alternate, simple, ovate to cordate, 5 to 6 inches long, with serrate margins, pinnately veined, base is unequally cordate, green above and paler below.

Flower: Monoecious; pale yellow, borne below a long, gracefully curving leafy wing in a many branched cluster, several inches long, appearing in early to mid-summer.

Fruit: A round, unribbed nutlet (1/4 inch) that is covered with gray-brown hair; occur in a hanging cluster with a curving, leafy bract acting as wing on top of the cluster, ripening in the fall.

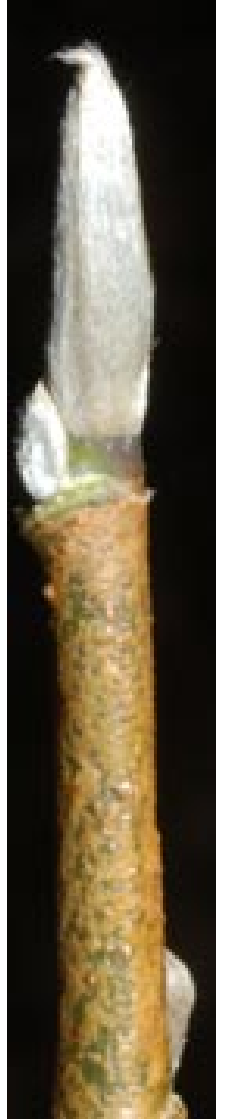
Twig: Moderately stout, zigzag, green (summer) or red (winter); terminal bud is false, each very plump with one side bulging out disproportionately. Buds are edible but very mucilaginous.

Fun facts

In addition to the many uses mentioned above, American basswood's big, soft, papery leaves are the woodsman's friend. The name basswood refers to "bass cloth" made from the fibrous bark of the tree.

Cucumbertree

Magnolia acuminata



State only

Cucumbertree

Magnolia acuminata

Leaf: Alternate, simple, elliptical or ovate, 6 to 10 inches long, pinnately veined, entire margin, acuminate tip, dark green above and paler, whitened below.

Flower: Monoecious; 2 1/2 to 3 inches long, high in the tree, green to greenish-yellow, appearing in late spring or early summer.

Fruit: An aggregate of follicles, 2 to 3 inches long, cylindrical, initially green (cucumber-like), then red, and later dark brown; seeds inside follicles are 1/2 inch long, nearly round, red when mature in the fall.

Twig: Moderately stout, red-brown, light lenticels; large, silky, white terminal bud, stipule scars encircle the twig. Twigs have a spicy-sweet smell when broken.

Bark: Light gray-brown and flaky, quite soft (can dent with thumbnail), much darker reddish brown when flaked away.

Form: Pyramidal when young, developing a straight trunk and a rounded crown reaching up to 80 feet tall.

The Oaks - *Quercus* sp.

Upland White Oaks

- White oak (*Quercus alba*)
- Chestnut oak (*Quercus montana*)
- Post oak (*Quercus stellata*)
- Chinquapin oak (*Quercus muehlenbergii*)

Bottomland White Oaks

- Swamp chestnut oak (*Quercus michauxii*)
- Bur oak (*Quercus macrocarpa*)
- Overcup oak (*Quercus lyrata*)
- Swamp white oak (*Quercus bicolor*)

Upland Red Oaks

- Northern red oak (*Quercus rubra*)
- Southern red oak (*Quercus falcata*)
- Black oak (*Quercus velutina*)
- Scarlet oak (*Quercus coccinea*)
- Blackjack oak (*Quercus marilandica*)
- Shingle oak (*Quercus imbricaria*)

Bottomland Red Oaks

- Pin oak (*Quercus palustris*)
- Water oak (*Quercus nigra*) (State only)
- Cherrybark oak (*Quercus pagoda*)
- Nuttall oak (*Quercus nuttallii*)
- Willow oak (*Quercus phellos*)
- Shumard oak (*Quercus shumardii*)

*state only

The Oaks - *Quercus* sp.

White oak group

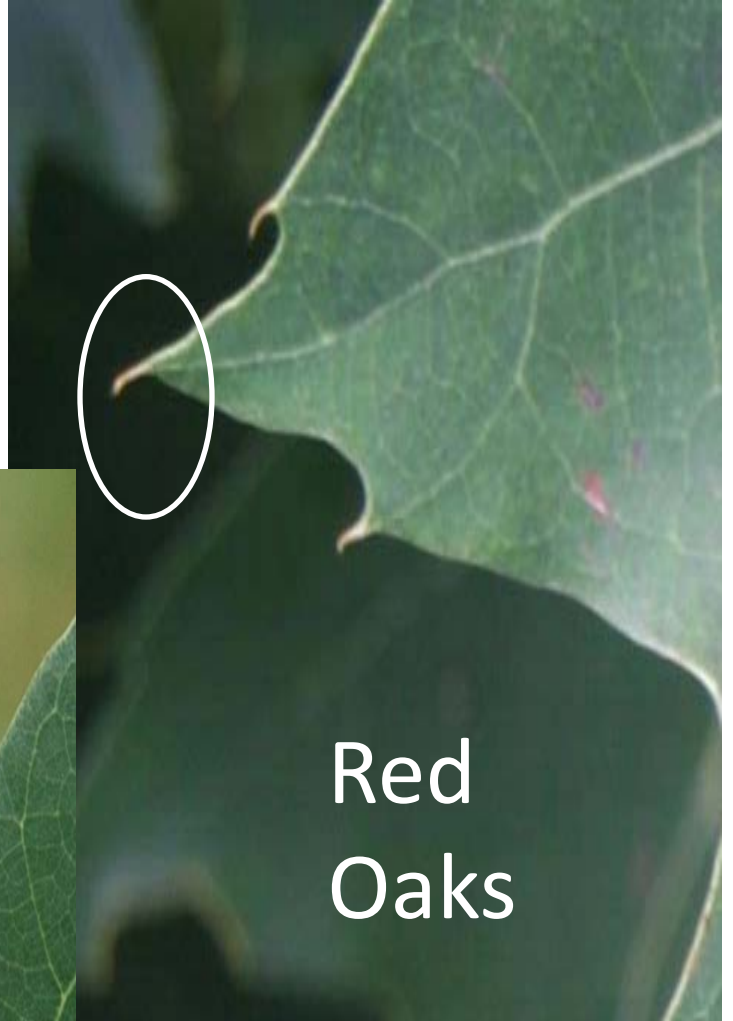
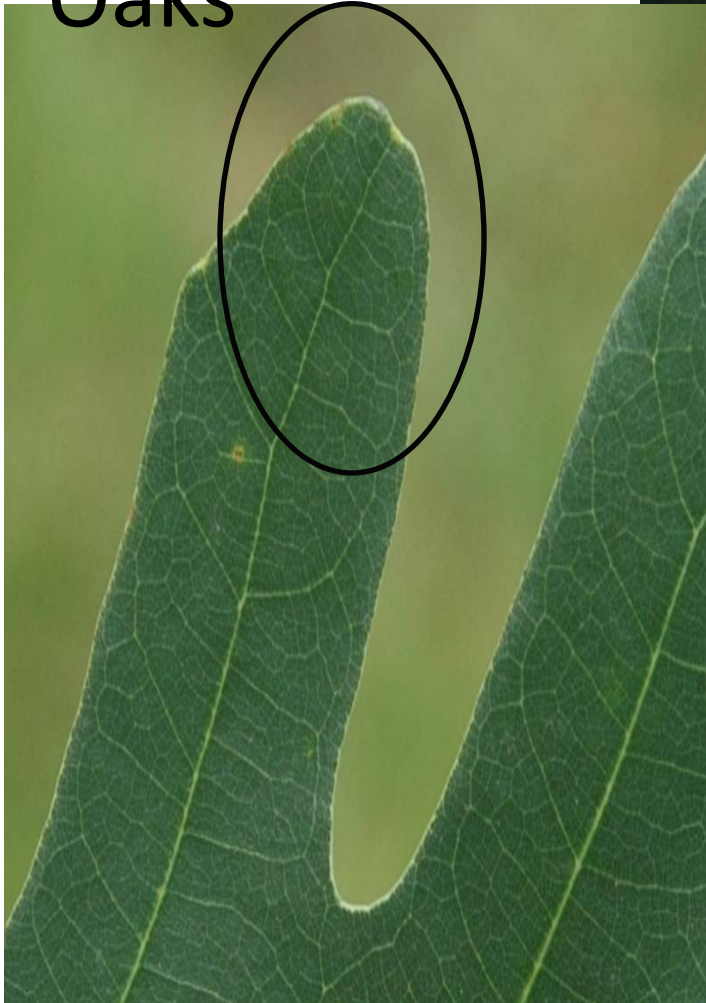
- leaf tip and lobes are usually rounded; if lobes are pointed they do not have bristle-tips; acorns mature in a single season; inner shell of nut is smooth; acorns usually germinate in the fall and often taste sweet; bark is gray, whitish-gray or with shades of cream.

Red oak group

- leaf tip and lobes are usually bristle-tipped; acorns mature at the end of two growing seasons; inner shell of nut is usually woolly or silky; acorns usually germinate in the spring and normally taste bitter; bark is gray, black or brownish-black.

White Oak and Red Oak Groups

White
Oaks



Red
Oaks

The Red Oaks

Black oak



Black oak



Black oak – *Quercus* *velutina*

- **Leaf:** Alternate, simple, 4 to 10 inches long, obovate or ovate in shape with 5 (mostly) to 7 bristle-tipped lobes; leaf shape is variable, with sun leaves having deep sinuses and shade leaves having very shallow sinuses, lustrous shiny green above, paler with a scruffy pubescence and axillary tufts below.
- **Flower:** Monecious, males borne on slender yellow-green catkins; females are reddish green and borne on short spikes in leaf axils, appearing in spring with the leaves.
- **Fruit:** Ovoid acorns, 1/2 to 3/4 inch long, 1/3 to 1/2 enclosed in a bowl-shaped cap; cap scales are loosely appressed (particularly loose on edges of cap), light brown and fuzzy, matures in 2 years in late summer and fall.
- **Twig:** Stout and red-brown to gray-green, usually glabrous but rapidly growing twigs may be hairy; buds are very large (1/4 to 1/2 inch long), buff-colored, fuzzy, pointed and distinctly angular.
- *Quercus* Latin name. *velutina* Latin "velutum" (velvety, in reference to the buds).

Scarlet oak



Scarlet oak



Scarlet oak – *Quercus* *coccinea*

- **Leaf:** Alternate, simple, 3 to 7 inches long, oval in shape with very deep sinuses and bristle-tipped lobes, shiny green above, paler and generally hairless below but may have tufts in vein axils.
- **Flower:** Monoecious; males are borne on slender yellow-green catkins; females are borne on very short axillary spikes, both appear with the leaves in spring.
- **Fruit:** Acorns are 1/2 to 1 inch long, with the cap covering 1/2 of the nut, cap scales are shiny, somewhat resembling a varnished black oak cap, scales on edges of cap generally not loose; the tip of the acorn may have concentric rings or fine cracks; maturing in two years and ripening in the fall.
- **Twig:** Moderately stout, red-brown with multiple terminal buds; buds reddish brown, plump, pointed, slightly angled, and covered with a light colored pubescence on the top half.
- *Quercus* Latin name. *coccinea* scarlet, Greek "kakkos" (a berry).

Southern red oak



Southern red oak



Southern red oak -

Quercus falcata

- **Leaf:** Alternate, simple, 5 to 9 inches long and roughly obovate in outline with bristle tipped lobes. Two forms are common: 3 lobes with shallow sinuses (common on younger trees) or 5 to 7 lobes with deeper sinuses. Often resembles a turkey foot with one very long hooked terminal lobe with two shorter lobes on the sides. Shiny green above, paler and fuzzy below.
- **Flower:** Monoecious; males yellow-green (tinged with red) borne on long thread like catkins; females reddish and borne on short spikes, both appearing in spring with the leaves.
- **Fruit:** Acorns are 1/2 inch long, orange-brown and pubescent. The cap covers less than 1/3 of the nut and is quite thin and flattened; cap scales are orange-brown, appressed and slightly pubescent; matures after two years, ripens in the fall.
- **Twig:** Reddish brown in color, may be gray-pubescent (particularly rapidly growing stems such as stump sprouts) or glabrous; multiple terminal buds are dark reddish brown, pubescent, pointed and only 1/8 to 1/4 inch long, laterals buds are similar, but shorter.
- *Quercus* Latin name. *falcata* sickle-shaped (leaves).

Northern red oak



Northern red oak



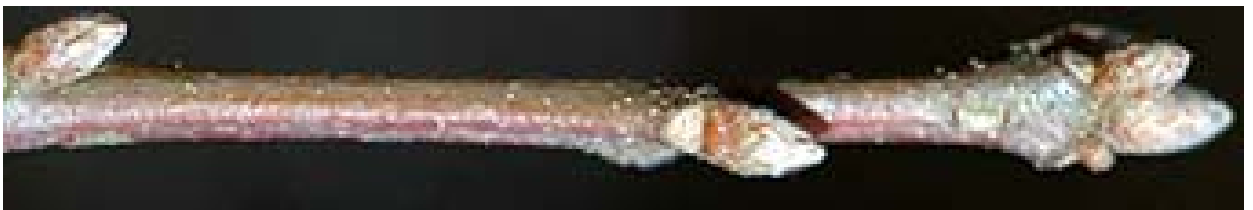
Northern red oak –

Quercus rubra

- **Leaf:** Alternate, simple, 5 to 8 inches long, oblong in shape with 7 to 11 bristle-tipped lobes, sinuses extend $\frac{1}{3}$ to $\frac{1}{2}$ of the way to midvein, generally very uniform in shape, dull green to blue-green above and paler below.
- **Flower:** Monoecious; males in yellow-green slender, hanging catkins, 2 to 4 inches long; females are borne on short axillary spikes, appearing with the leaves in spring.
- **Fruit:** Acorns are $\frac{3}{4}$ to 1 inch long and nearly round; cap is flat and thick, covering about $\frac{1}{4}$ or less of the acorn, resembling a beret; matures in 2 growing seasons, in late summer and fall.
- **Twig:** Quite stout, red-brown and glabrous; terminal buds multiple, quite large, conical, and covered with red-brown, mostly hairless scales but terminal scales may bear some frosty pubescence.
- *Quercus* Latin name. *rubra* red.

Water Oak (state only)

Quercus nigra



Water oak

Leaf: Alternate, simple, 2 to 4 inches long and extremely variable in shape (from spatulate to lanceolate), may be 0 to 5 lobed, margins may be entire or bristle-tipped, both surfaces are glabrous, but axillary tufts may be present below.

Flower: Staminate flowers borne on catkins. Pistillate flowers borne on spikes, appearing with the leaves.

Fruit: Acorns are 1/2 inch long, very dark in color, and 1/3 covered by a flattened cap with appressed scales, maturing in fall of the second year.

Twig: Slender, red-brown; buds short, sharp-pointed, angular, red-brown, multiple at the tip.

Fun Facts

When young, water oak leaves are nearly evergreen; leaves of mature individuals persist long into the winter. Water oak is a principal alternate host to the fusiform rust fungus that debilitates pines; it is only minorly affected by the rust itself.

Quercus Latin name. *nigra* black.

The White Oaks

Chestnut oak



Chestnut oak



Chestnut oak - *Quercus* *prinus*

- **Leaf:** Alternate, simple, 4 to 6 inches long, obovate to elliptical in shape with a crenate margin, shiny green above and paler below.
- **Flower:** Monoecious; male flowers are yellow-green, borne in naked catkins, 2 to 4 inches long; female flowers are reddish and appear as single spikes, appearing with the leaves in mid-spring.
- **Fruit:** Acorns are 1 to 1 1/2 inches long, ovoid in shape and separate from the cap when mature; cap is thin, warty and shaped like a teacup, edges of cap are very thin; matures in one growing season, ripening in the fall.
- **Twig:** Medium textured, lacking hair, orange-brown or grayish in color with chestnut brown multiple terminal buds that are pointed, narrowly conical and quite long.
- *Quercus* Latin name. *prinus* perhaps a variation of "primus" (first) or Greek "prinos" (evergreen tree).

Post oak



Post oak



Post oak – *Quercus* *stellata*

- **Leaf:** Alternate, simple, oblong, 6 to 10 inches long, with 5 lobes, the two middle lobes are distinctly square, resulting in an overall cruciform appearance, thickened texture; green above with scattered stellate pubescence, pubescent and paler below.
- **Flower:** Monoecious; male flowers are yellow-green, borne in naked, hanging catkins, 2 to 4 inches long; female flowers are reddish and appear as single, short spikes from leaf axils, appearing with the leaves.
- **Fruit:** Acorns are 1/2 to 2/3 inches long and ovoid; cap is bowl-shaped and warty/scaly, covering 1/3 to 1/2 of the nut; Individual scales are more apparent than white oak; maturing in one year and ripening in the fall.
- **Twig:** Gray or tawny-tomentose and dotted with numerous lenticels; multiple terminal buds are short, blunt, orange-brown, somewhat pubescent, short, thread-like stipules may be present.
- *Quercus* Latin name. *stellata* stellate (covered with stars), referring to hairs on leaf undersides.

White oak



White oak



White oak – *Quercus alba*

- **Leaf:** Alternate, simple, oblong to ovate in shape, 4 to 7 inches long; 7 to 10 rounded, finger-like lobes, sinus depth varies from deep to shallow, apex is rounded and the base is wedge-shaped, green to blue-green above and whitish below.
- **Flower:** Monoecious; male flowers are yellow-green, borne in naked, slender catkins, 2 to 4 inches long; female flowers are reddish green and appear as very small single spikes; appearing with the leaves in mid-spring.
- **Fruit:** Ovoid to oblong acorn, cap is warty and bowl-shaped, covers 1/4 of the fruit; cap always detaches at maturity; matures in one growing season in the early fall.
- **Twig:** Red-brown to somewhat gray, even a bit purple at times, hairless and often shiny; multiple terminal buds are red-brown, small, rounded (globose) and hairless.
- *Quercus* Latin name. *alba* white.

Bibliography

- USDA PLANTS Database at
<http://plants.usda.gov/index.html>
- Forest Biology and Dendrology Education at Virginia Tech “Tree Facts Sheets”
<http://www.fw.vt.edu/dendro/dendrology/factsheets.cfm>
- University of Tennessee Herbarium at
<http://tenn.bio.utk.edu/>
- Forest Images
<http://www.forestryimages.org/treesplants.cfm>
- National 4-H Forestry Invitational
<http://www.aces.edu/N4HFI/>
- Bioimages Department of Biological Sciences, Vanderbilt University
<http://www.cas.vanderbilt.edu/bioimages/frame.htm>