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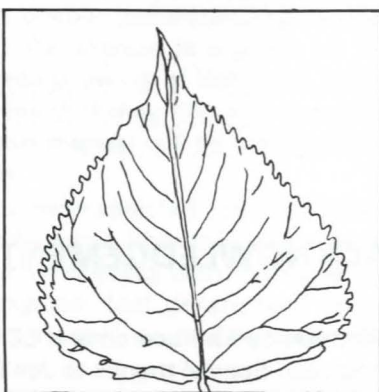
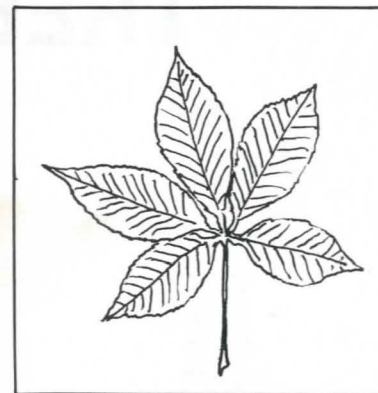
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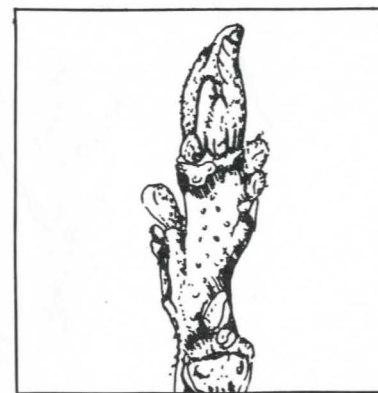
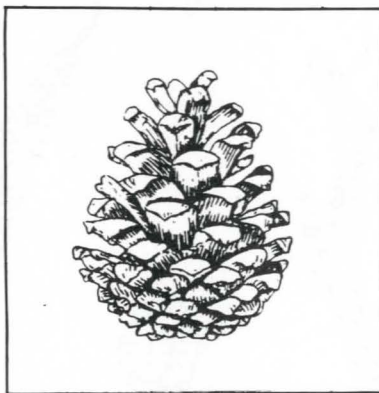
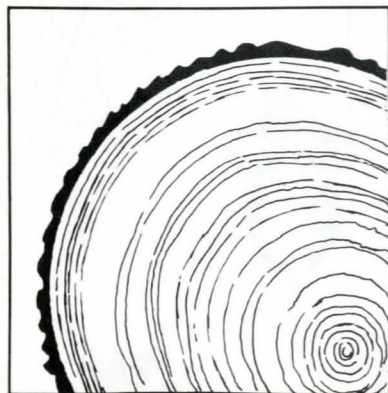
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Nebraska Cooperative Extension Service EC 83-1750



43 TREES OF NEBRASKA



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TREE IDENTIFICATION MANUAL

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ACKNOWLEDGEMENT

EC 17-01-78, Tree and Shrub Identification by Karl Loerch and EC 71-1703, Tree Identification Manual by Ellsworth H. Benson were used for this manual. Special thanks to Joe Range, Extension Forester, and John Orr, Extension Specialist, 4-H and Youth Development, for their assistance and support. A special thank you is extended to Frances Gould for her exceptional illustrations and to Terry Meisenbach for his valuable editorial assistance.

TREE IDENTIFICATION MANUAL FOR SELECTED SPECIES

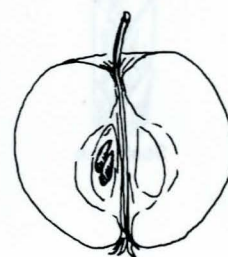
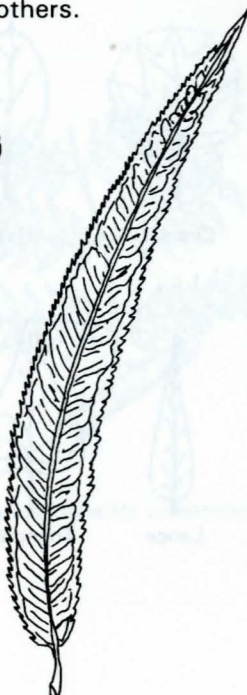
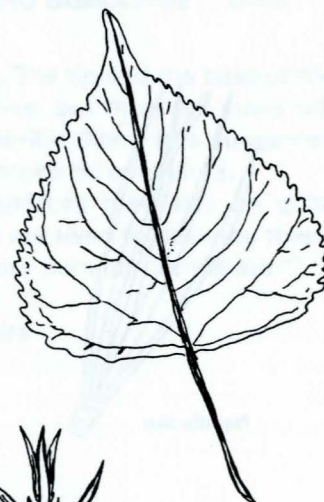
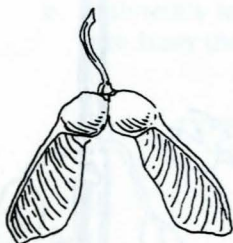
by
Mitchell D. Ferrill, Extension Forester

INTRODUCTION

This manual is designed for people who are interested in learning about trees. It is important that a person be able to identify individual trees before exploring the study areas of tree and forest ecology and having a deeper understanding of the outdoor environment. The manual is a guide for forty-three species of trees growing in Nebraska, but does not include all trees that may occur in the state. Individuals using this manual will be able to identify trees and tree parts.

Included for each selected species is the common name, scientific name (the only sure way to be sure that everyone is working with the same species), a general description, leaf description, twig description, bud description, fruit description and wood description.

Trees and tree parts vary greatly in size, shape, form, color, etc. The proper identification of trees calls for not only knowing one leaf or one fruit from another, but also knowing something about the trees themselves. It must be kept in mind that all trees are different in some aspects and very much alike in others.



HARDWOOD AND CONIFERS

Whenever identifying trees the usual first decision should be to determine if the tree is a hardwood or conifer. Other terms used are:

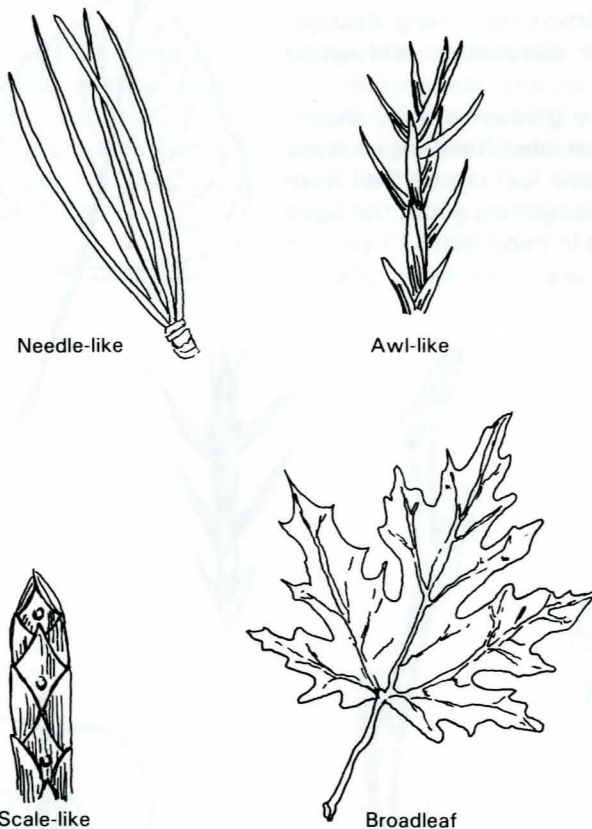
hardwoods	conifers
deciduous	evergreens
broadleaved	softwoods
	narrowleaved

Obviously the above names may not always seem to apply to a particular tree. Whenever leaves are on the trees, conifers will normally have needles or scale-like leaves, while hardwoods will have broader leaves. There are exceptions since there are deciduous conifers and evergreen hardwoods.

LEAVES (see diagram)

Conifers: Coniferous leaves are usually needles, but may be awl-shaped or scale-like. The needles may be borne in groups or bundles called fascicles or attached singly. A determination of the type of foliage and the arrangement of the foliage is important in the identification of a particular tree.

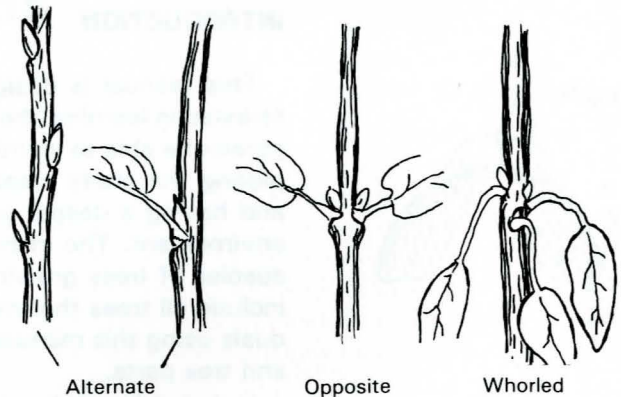
KINDS OF LEAVES



Hardwoods: Leaf arrangement and form are more variable in hardwoods. As a result, more understanding and terminology are necessary to properly identify hardwoods. Some helpful terms to know are:

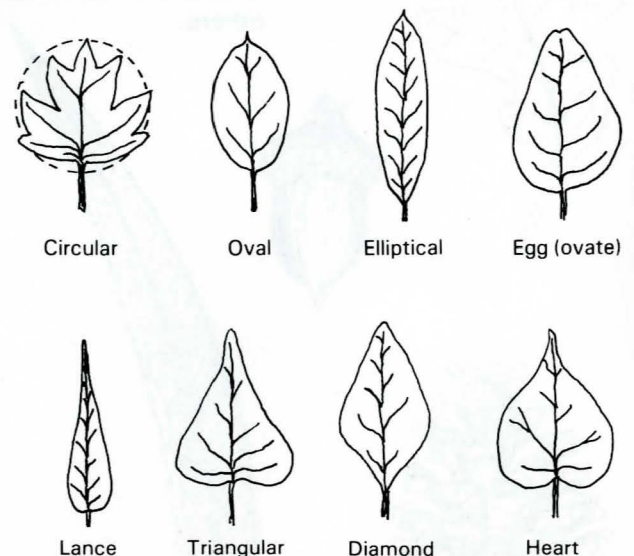
- alternate - a single leaf is attached at each node.
- opposite - paired at the same height, one on each side of the twig.
- whorled - when more than two leaves are found at a node.

LEAF ARRANGEMENT



Leaf shapes. The shape of a leaf or leaflet is usually characteristic of a species. There are numerous accepted terms to describe hardwood leaf shapes. Some of the basic ones are shown in the enclosed figures. For more detailed descriptions some of the books listed in the references should be consulted.

LEAF SHAPES



Leaf composition

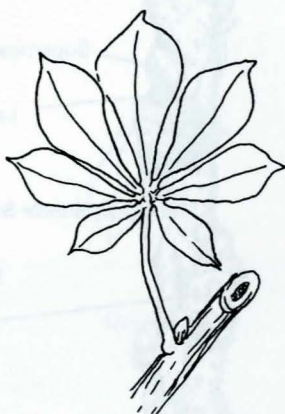
The basic forms of leaf composition for hardwoods are: (see diagram)

- simple leaf - one with a single leaf blade.
- compound leaf - three or more blades attached to a common stalk.
 - a. pinnately compound - leaflets are attached laterally along the stem or rachis.
 - 1) once pinnately compound - only divided once.
 - 2) twice pinnately or bipinnately compound - divided twice with leaflets on lateral stems.
 - b. palmately compound - several leaflets radiate from the end of the rachis.

TYPES OF LEAVES



Simple



Palmately compound



Pinnately compound

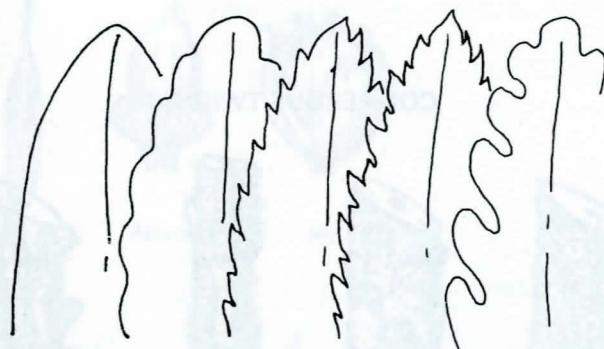


Twice Pinnately compound

Leaf margins. Leaf margins are quite variable and many terms are used to describe them. Three of the more common types are:

1. entire - smooth, without lobes or teeth
2. serrate - with sharp teeth
3. lobed - divided into lobes separated by rounded sinuses (holes)

LEAF MARGINS



Smooth Wavy Serrate Doubly Serrate Lobed

Leaf apices and bases. The tip and the base of the leaf may be very distinctive, but there are many different terms used to describe them. It is suggested that more detailed references be consulted.

Leaf surfaces. Leaf surfaces may also be quite variable and many terms are used to describe them. Two of the basic and more common terms are:

1. glabrous - smooth
2. pubescent - with hairs

TWIG ARRANGEMENT (see diagrams)

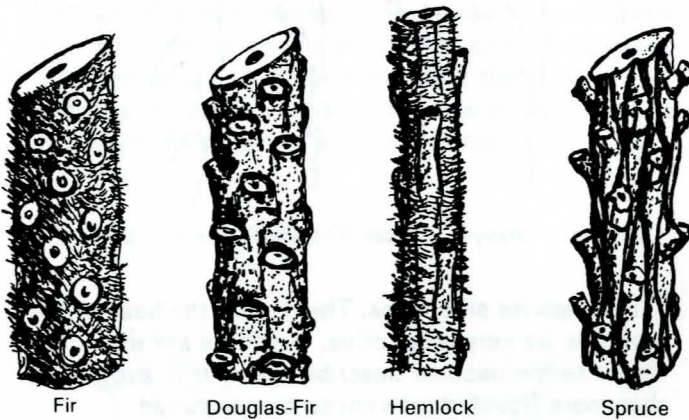
The twig arrangement is often characteristic of a species for either a conifer or hardwood.

Conifers. The arrangement of the twigs themselves are not very distinct, but the manner of leaf attachment may be (see diagram). Two of the more distinctive are:

1. fir - hole or crater-like leaf scars
2. spruce - pegs or "stumps" for leaf scars

Hardwoods. The twig arrangement of hardwoods is very helpful in separating species groups. The basic arrangements are alternate, opposite, and whorled.

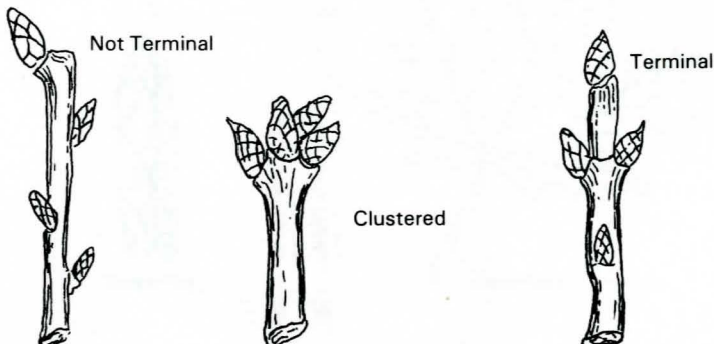
CONIFEROUS TWIGS



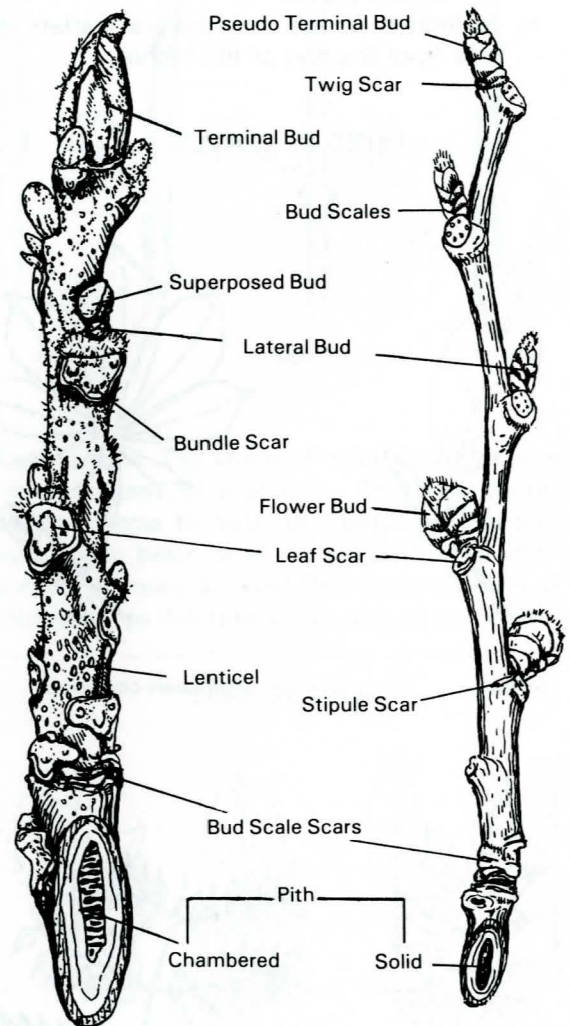
BUD ARRANGEMENT

Although buds are helpful in identification, the descriptive factors are so variable that simple terminology and descriptions are not always available. More detailed references should be consulted for identifying bud characteristics.

BUD ARRANGEMENT



TWIG DETAILS



FRUITS

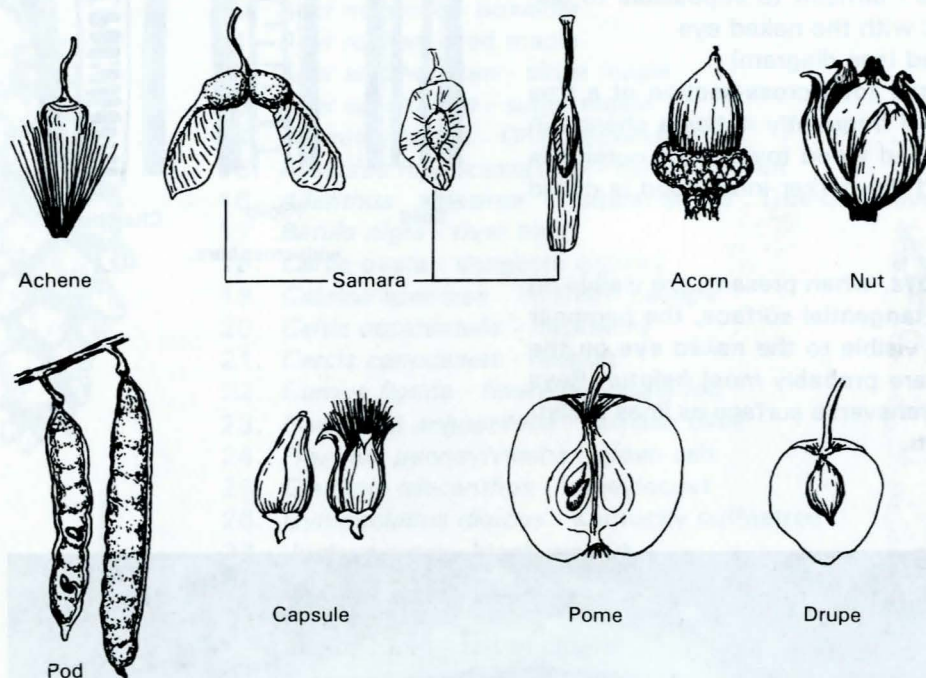
Whenever present, fruit or seed may be very helpful in verifying the species in question. Unfortunately it may be difficult to obtain the fruit.

Conifers. The majority of the conifers in the United States produce cones, as a result all coniferous species included in this manual produce a cone.

Hardwoods. Hardwood fruits or seeds are much more variable. Some of the types are (see diagram):

1. drupe - cherry (an example)
2. berry - persimmon (an example)
3. pome - apple (an example)
4. legume - bean (an example)
5. capsule - horsechestnut (an example)
6. achene - sycamore seeds (an example)
7. samara - maple (an example)
8. nut - hickory nut and acorns (examples)

TREE FRUITS



WOOD

The terminology and factors needed to correctly identify wood are relatively complicated and only a basic introduction will be included in this manual. Some of the structural features of wood that can be recognized and used for identification purposes are:

Planes of wood (see diagram)

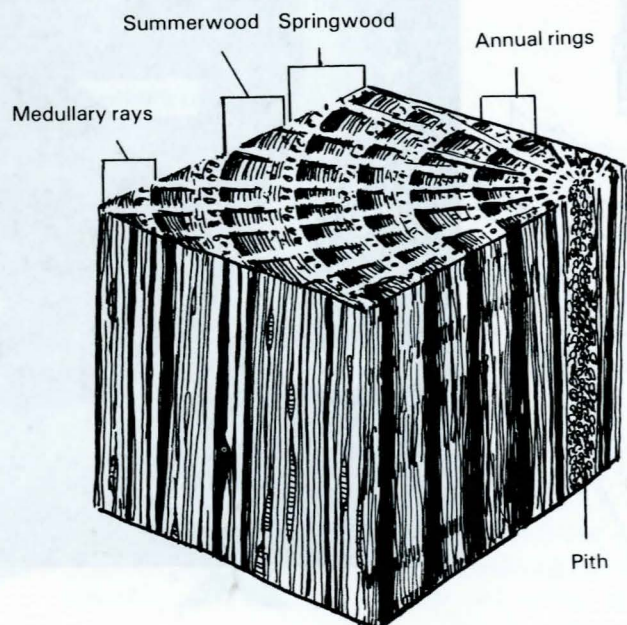
- a. transverse or cross-section is produced by cutting across the stem perpendicularly
- b. radial surface is created by cutting longitudinally from the pith to the bark
- c. tangential surface is created by cutting tangential to the bark

Growth rings

a *Conifers*

- 1) spring wood - normally have large thin-walled cells
- 2) summerwood - smaller, thicker-walled cells
- 3) abrupt transition - sharp distinction between spring and summerwood

PLANES OF WOOD



4) gradual transition - gradual change from spring to summerwood

b. Hardwoods

1) earlywood - formed early in the growing season, large cells

2) latewood - formed later in the growing season, smaller cells

3) ring porous - obvious distinction between early and latewood

4) semiring porous - identifiable change, but less obvious

5) diffuse porous - difficult to impossible to distinguish the change with the naked eye

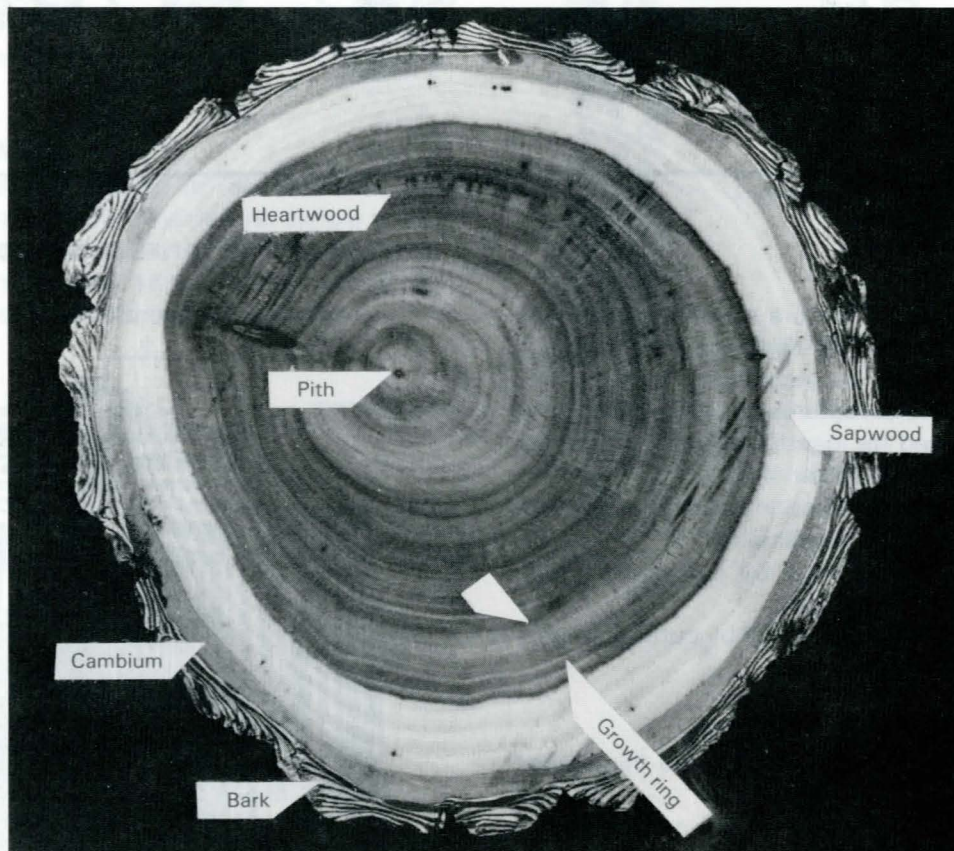
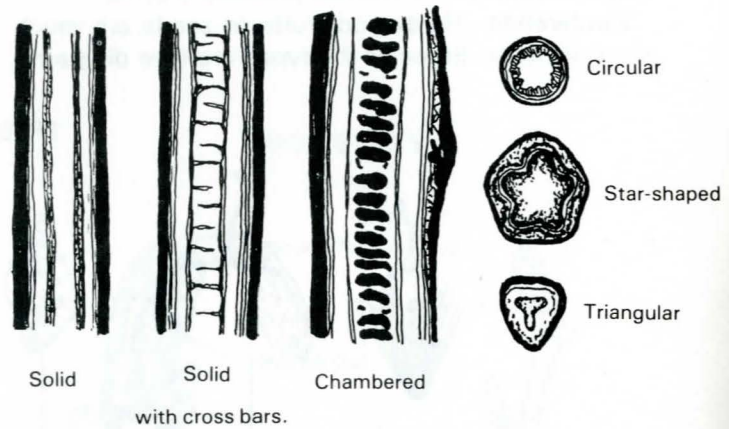
Sapwood-Heartwood (see diagram)

While observing the total cross-section of a tree trunk or limb you will frequently notice a change in color. The light colored wood toward the outside is called sapwood and the darker innerwood is called heartwood.

Wood Rays

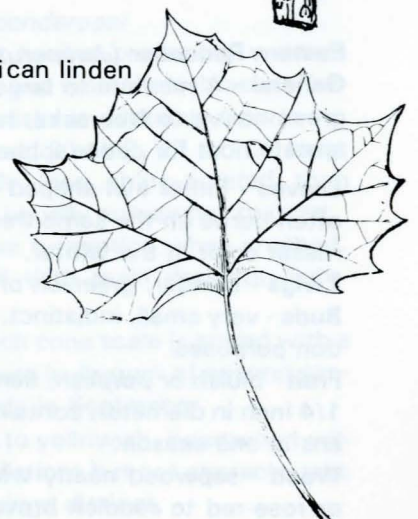
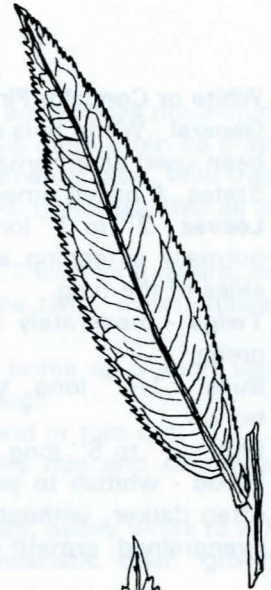
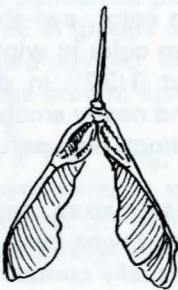
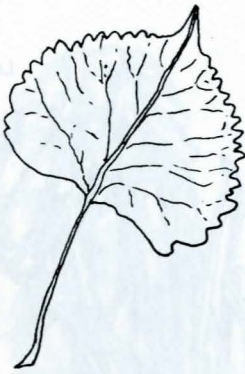
Although wood rays, when present, are visible on the transverse and tangential surface, the beginner will find that those visible to the naked eye on the transverse surface are probably most helpful. Rays will appear on the transverse surface as lines radiating out from the pith.

PITH TYPES AND SHAPES



ILLUSTRATED SPECIES

1. *Abies concolor* - white or concolor fir
2. *Juniperus scopulorum* - Rocky Mountain juniper
3. *Juniperus virginiana* - eastern redcedar
4. *Picea pungens* - blue spruce
5. *Pinus nigra* - Austrian pine
6. *Pinus ponderosa* - ponderosa pine
7. *Pinus strobus* - eastern white pine
8. *Pinus sylvestris* - Scotch or Scots pine
9. *Pseudotsuga menziesii* - Douglas-fir
10. *Acer negundo* - boxelder
11. *Acer rubrum* - red maple
12. *Acer saccharinum* - silver maple
13. *Acer saccharum* - sugar maple
14. *Aesculus glabra* - Ohio buckeye
15. *Aesculus hippocastanum* - horsechestnut
16. *Ailanthus altissima* - ailanthus or Tree-of-Heaven
17. *Betula nigra* - river birch
18. *Carya ovata* - shagbark hickory
19. *Catalpa speciosa* - northern catalpa
20. *Celtis occidentalis* - hackberry
21. *Cercis canadensis* - redbud
22. *Cornus florida* - flowering dogwood
23. *Elaeagnus angustifolia* - Russian olive
24. *Fraxinus pennsylvanica* - green ash
25. *Gleditsia triacanthos* - honeylocust
26. *Gymnocladus dioica* - Kentucky coffeetree
27. *Juglans nigra* - black walnut
28. *Maclura pomifera* - osage orange, hedge apple, bois d'arc, bodark
29. *Malus pumila* - apple
30. *Morus rubra* - red mulberry
31. *Platanus occidentalis* - American sycamore or buttonball tree
32. *Populus alba* - white poplar
33. *Populus deltoides* - eastern cottonwood
34. *Prunus americana* - American plum
35. *Prunus serotina* - black cherry
36. *Quercus macrocarpa* - bur oak or mossycup oak
37. *Quercus palustris* - pin oak
38. *Quercus rubra* - northern red oak
39. *Robinia pseudoacacia* - black locust
40. *Salix nigra* - black willow
41. *Tilia americana* - American basswood or American linden
42. *Ulmus americana* - American elm
43. *Ulmus pumila* - Siberian elm



White or Concolor Fir (*Abies concolor*)

General - White fir is not native to Nebraska but has been used as an ornamental throughout the United States. A prized ornamental.

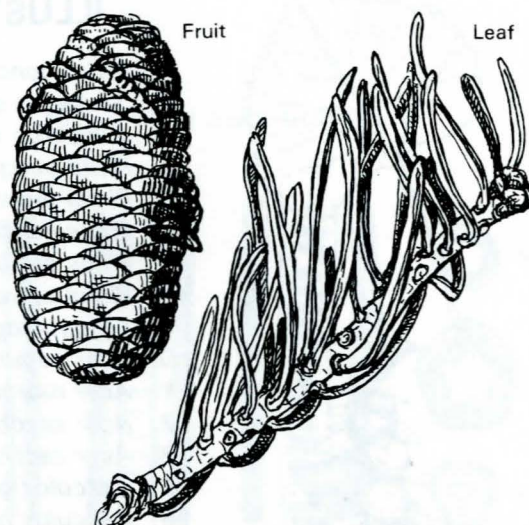
Leaves - 2" to 3" long, borne singly, silvery-green, normally extending at nearly right angles from all sides of the twig.

Twigs - moderately stout, yellowish to brownish-green.

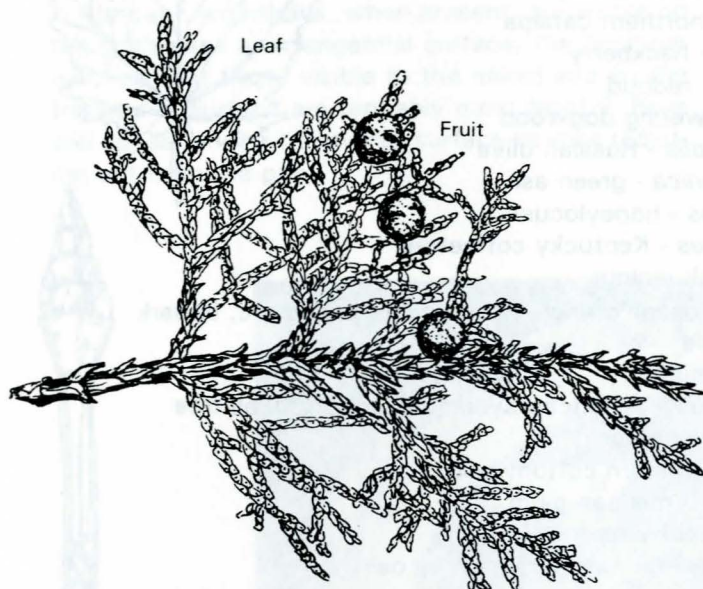
Buds - 1/4" long, tends to be sticky, yellowish brown.

Fruit - 3" to 5" long, oblong, green to purple.

Wood - whitish to yellowish brown, summerwood often darker, without characteristic odor, normally evengrained, growth rings distinct.



White or Concolor Fir - *Abies concolor*



Rocky Mountain Juniper - *Juniperus scopulorum*

Rocky Mountain Juniper (*Juniperus scopulorum*)

General - Occurs naturally west of the Great Plains and into the Rocky Mountains. May be native to western Nebraska.

Leaves - Usually opposite on the twig, pressed close to the twig, variable in color, awl-shaped or scale-like, retains bluish-green color in winter.

Twigs - slender, about 1/32" in diameter, older twigs reddish-brown and nearly smooth, peeling off.

Buds - very small, indistinct, not useful for identification purposes.

Fruit - takes two years to mature, nearly round, 1/4 to 1/3 inch in diameter, bright blue, often covered with a white coating, usually contains 2 seeds.

Wood - similar to redcedar, soft, lightweight, light red with narrow whitish sapwood.

Eastern Redcedar (*Juniperus virginiana*)

General - A medium to large, upright-growing evergreen native to Nebraska, hardy and long-lived. Alternate host for cedar/apple rust.

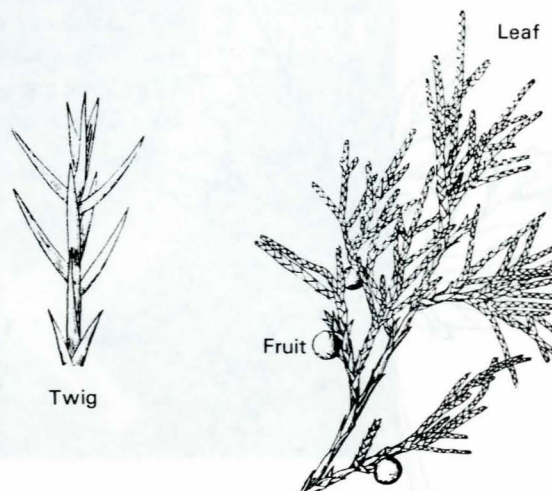
Leaves - Either awl-shaped or scale-like, both kinds often borne on the same tree, bluish-green turning a russet color in the winter.

Twigs - slender, greenish or reddish-brown in color.

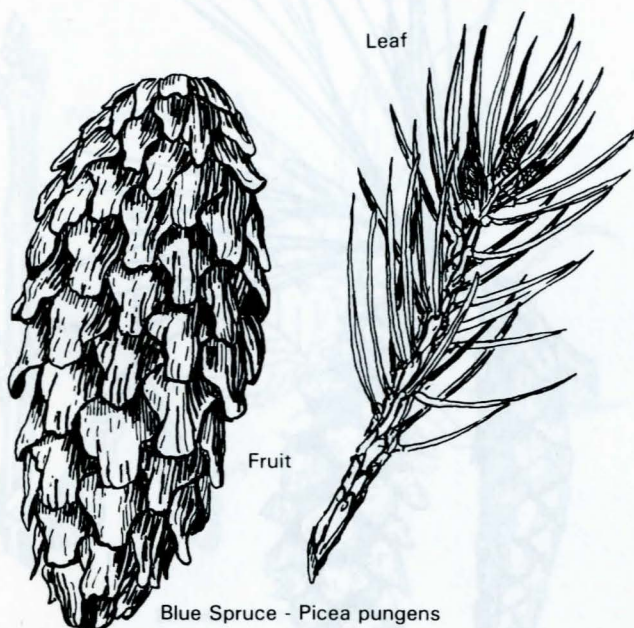
Buds - very small, indistinct, not useful for identification purposes.

Fruit - bluish or purplish, berry-like round cone about 1/4 inch in diameter, contains 2 or 3 hard seeds, ripens in one season.

Wood - sapwood nearly white, heartwood purplish or rose-red to reddish brown, characteristics odor, growth rings distinct.



Eastern Redcedar - *Juniperus virginiana*



Blue Spruce (*Picea pungens*)

General - in its native range, which does not include Nebraska, the blue spruce will more often be green rather than the selected ornamental blue. Wild trees may bear little resemblance to those selected as ornamentals.

Leaves - borne singly, about 1 inch long, sharp, extending at right angles to the twig, when chewed has a pungent taste.

Twigs - free of hair, leaves borne on a short stalk which remains part of the twig.

Buds - bud scales tend to bend or turn out.

Fruit - about 3" long, scales thin and somewhat papery.

Wood - heartwood not distinct, nearly white to light brown, lustrous, no characteristic odor, growth rings distinct.

Austrian Pine (*Pinus nigra*)

General - not native to Nebraska, a native of Europe, but grows well in Nebraska. Similar in size and habit to the native ponderosa pine.

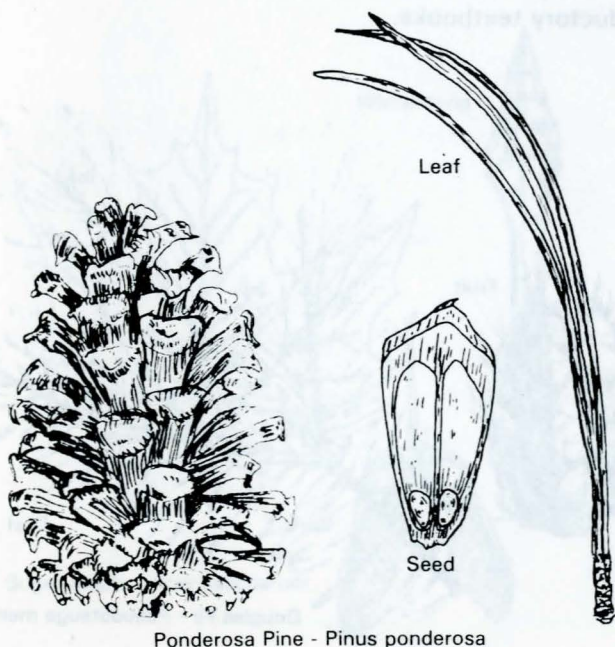
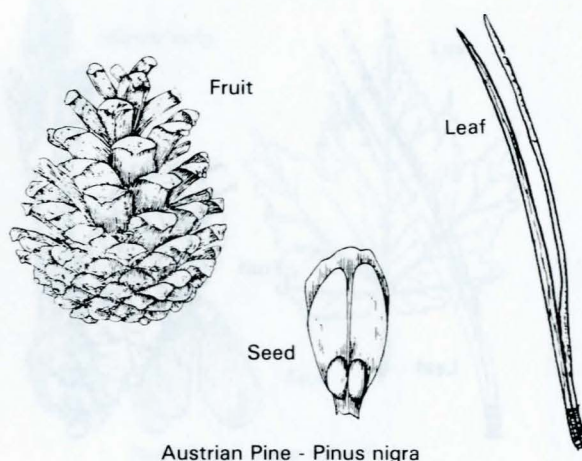
Leaves - borne in groups of 2, 3" to 6" long, slender, stiff, sharp-pointed, bluish-green.

Twigs - orange-brown, lustrous.

Buds - silvery.

Fruit - about 2 1/2" long, unarmed.

Wood - sapwood nearly white, heartwood reddish brown, somewhat oily and resinous, no characteristic odor, growth rings distinct.



Ponderosa Pine (*Pinus ponderosa*)

General - an important lumber-producing western pine. Native to northern and western Nebraska. Normal growth rate in Nebraska is relatively slow.

Leaves - borne in groups of 2 and 3, 3" to 10" long, yellowish-green, usually less sharp-pointed than those of Austrian pine, usually somewhat twisted.

Twigs - stout, smells like turpentine when crushed.

Buds - usually covered with resin droplets, light-chestnut brown.

Fruit - 3" to 6" long, each cone scale is armed with a short, sharp spine, mature in August of second season and shed most seeds in September.

Wood - sapwood white to yellowish, heartwood yellowish to light brown, distinct but not characteristic resinous odor, growth rings distinct.

Eastern White Pine (*Pinus strobus*)

General - not native to Nebraska, but may be planted as an ornamental.

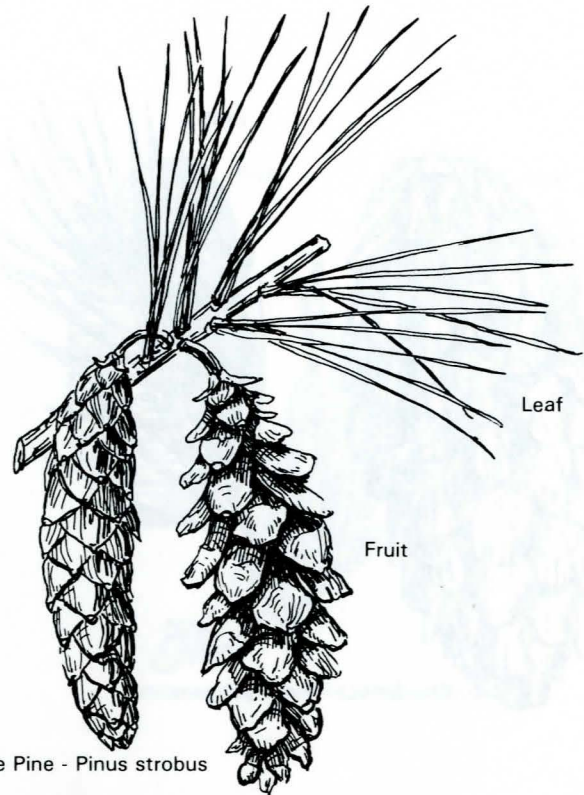
Leaves - borne in groups of 5, 3'' to 5'' long, dark blue-green, straight, slender, flexible.

Twigs - orange-brown, smooth or with only a few hairs.

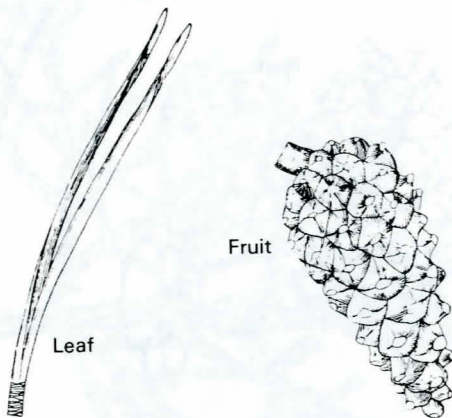
Buds - covered with thin reddish or orange-brown scales.

Fruit - about 5'' long, narrow, stalked, with thin scales, unarmed.

Wood - sapwood nearly white, heartwood darker, noncharacteristic odor, growth rings distinct.



Eastern White Pine - *Pinus strobus*



Scotch Pine - *Pinus sylvestris*

Scotch or Scots Pine (*Pinus sylvestris*)

General - not native to Nebraska. A preferred species for Christmas tree production.

Leaves - borne in groups of 2, about 2'' long, bluish-green, often twisted.

Twigs - medium-thick, dull grayish-yellow, roughed by scales at base of leaf clusters, upper branches.

Buds - no distinct features which are helpful in identification.

Fruit - a woody cone, 1 1/2-2'' long, scales with raised pyramid-shaped tips.

Wood - an exotic which is used very little in the wood products industry, little data available in introductory textbooks.

Douglas-fir (*Pseudotsuga menziesii*)

General - Douglas-fir is an important western commercial lumber tree and comprises about 50 percent of the standing timber of western forests. It is not native to Nebraska.

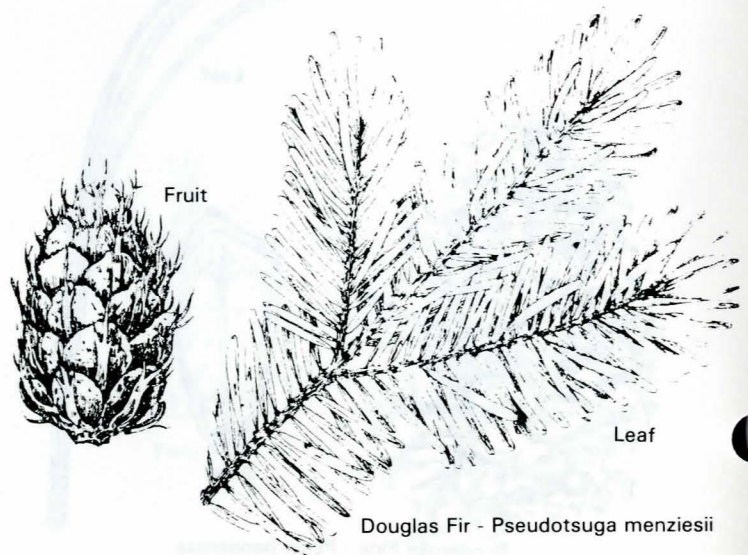
Leaves - borne singly, flat, blunt, about 1'' long, yellow-green.

Twigs - slender, flexible, smooth when leaves are detached.

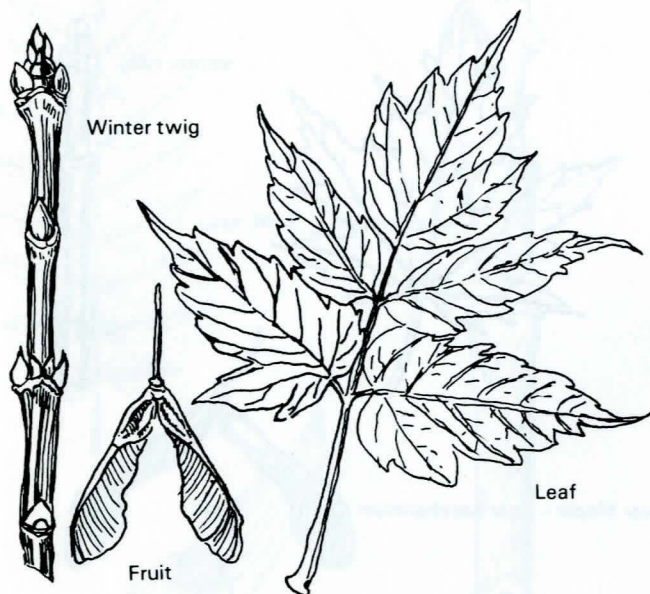
Buds - the cigar-shaped, sharp-pointed winter buds are about 1/2'' long.

Fruit - about 3'' long, pendent, each scale has attached to it a 3-pointed woody bract.

Wood - sapwood whitish to yellowish, heartwood, yellowish to reddish, with characteristic resinous odor, growth rings very distinct.



Douglas Fir - *Pseudotsuga menziesii*



Boxelder - *Acer negundo*

Red Maple (*Acer rubrum*)

General - wood is brittle and decays readily. Not native to Nebraska.

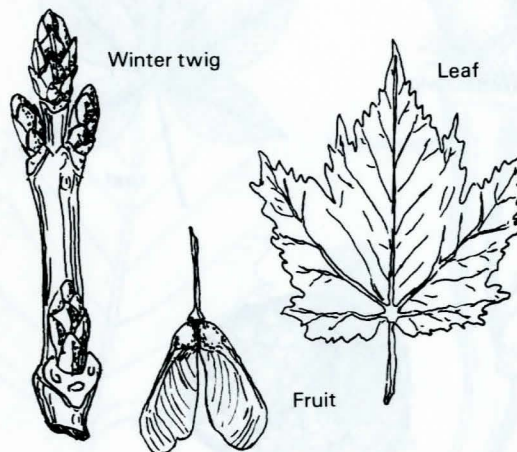
Leaves - simple, about 4" in diameter, typically 3-lobed, but may be 5-lobed.

Twigs - opposite, reddish, without a disagreeable odor when crushed.

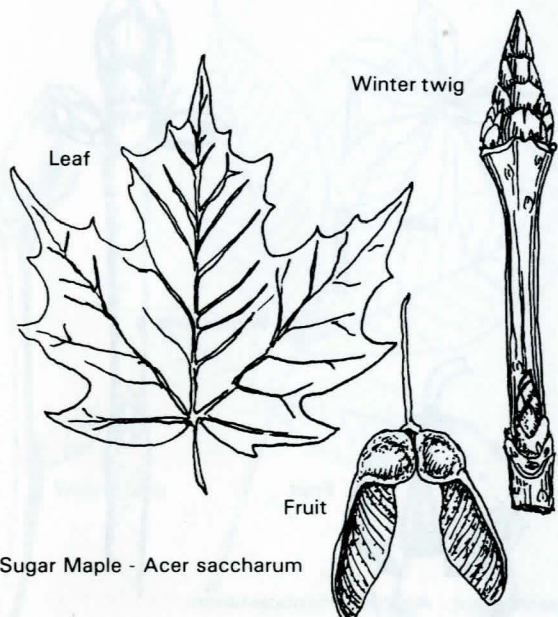
Buds - terminal bud present, lateral buds opposite around terminal.

Fruit - may be either V- or U-shaped, matures in late spring, about 3/4" long.

Wood - sapwood white, heartwood light brown, without characteristic odor, growth rings not very distinct.



Red Maple - *Acer rubrum*



Sugar Maple - *Acer saccharum*

Boxelder (*Acer negundo*)

General - although this tree has been planted extensively through the middle west because of its hardiness, it is not particularly decorative and is short lived and of poor form.

Leaves - opposite, compound with 3 to 7 leaflets, leaflets quite variable.

Twigs - stout, purplish to greenish, frequently covered with a bluish white coating.

Buds - terminal bud present, somewhat whitish woolly.

Fruit - V-shaped, double-winged samara, ripens in fall.

Wood - sapwood white, heartwood light brown, often colored by mineral stains, without characteristic odor, growth rings not very distinct.

Sugar Maple (*Acer saccharum*)

General - although not native to Nebraska, this species is probably the most common and important of the maples. Noted for the maple syrup made from the sap.

Leaves - simple, about 4" in diameter, 5-lobed.

Twigs - moderately slender, shiny, brown, opposite.

Buds - terminal bud present, pointed, many scales.

Fruit - U-shaped, double-winged samara, borne in fall.

Wood - sapwood whitish with a reddish tinge, heartwood light brown, without characteristics odor, growth rings fairly distinct.

Silver Maple (*Acer saccharinum*)

General - native to eastern Nebraska. A large and beautiful tree. Grows rapidly, but is prone to be brittle and breaks easily in storms.

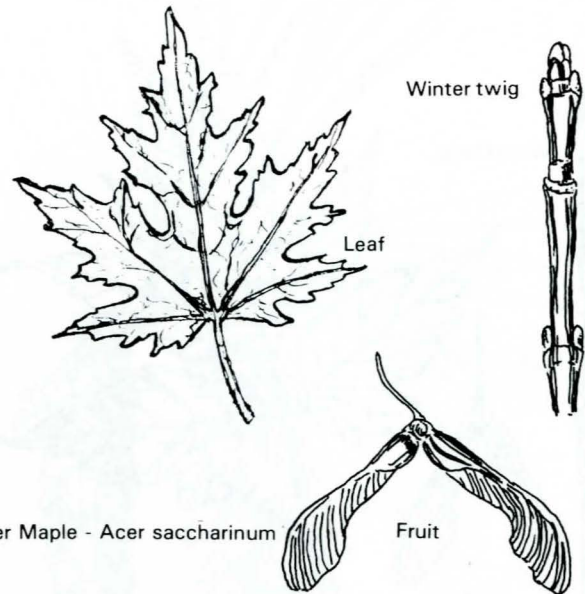
Leaves - simple, about 5" in diameter, deeply 5-lobed, sides of terminal lobe V-shaped, serrate on margin, green on upper surface, silvery below.

Twigs - opposite, orange-brown to red, disagreeable odor when bruised.

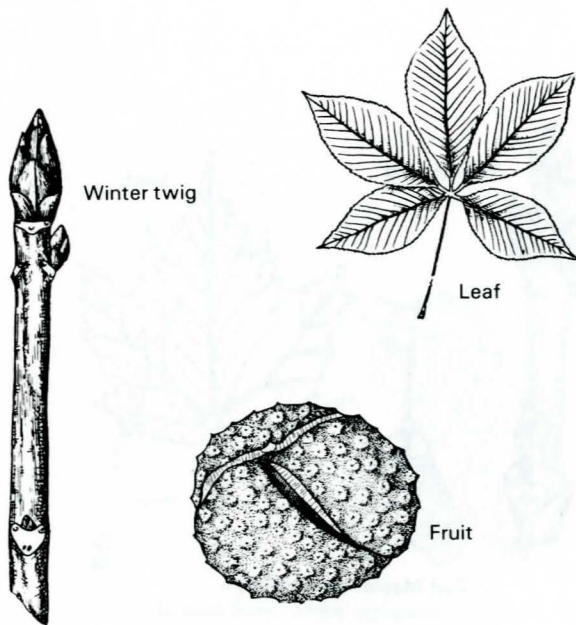
Buds - terminal bud present, blunt.

Fruit - widely divergent wings, about 1 1/2" long, borne in late spring.

Wood - sapwood white, heartwood light brown, without characteristic odor growth rings not very distinct.



Silver Maple - *Acer saccharinum*



Ohio Buckeye - *Aesculus glabra*

Ohio Buckeye (*Aesculus glabra*)

General - a medium-sized tree native to extreme southeastern Nebraska. Nowhere is it abundant.

Leaves - palmately compound, 5 leaflets, 3" to 6" long, smooth.

Twigs - opposite, stout, smooth, orange to brown.

Buds - terminal buds large, brown, not waxy.

Fruit - a thick leather, prickly, brownish, globular pod, about 1" in diameter, containing a large, smooth, shiny, brown "nut."

Wood - sapwood white to dull white, heartwood creamy to yellowish, growth rings normally not visible.

Horsechestnut (*Aesculus hippocastanum*)

General - not native to Nebraska. Planted as an ornamental.

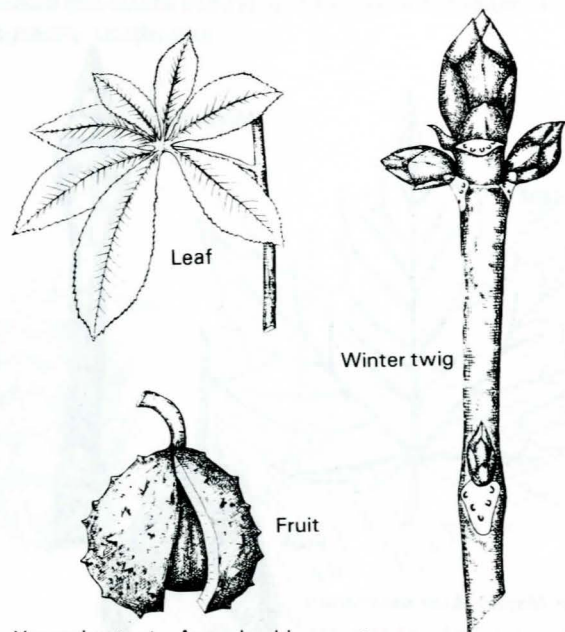
Leaves - palmately compound, usually 7 leaflets 5" to 7" long.

Twigs - opposite, stout, smooth, reddish-brown.

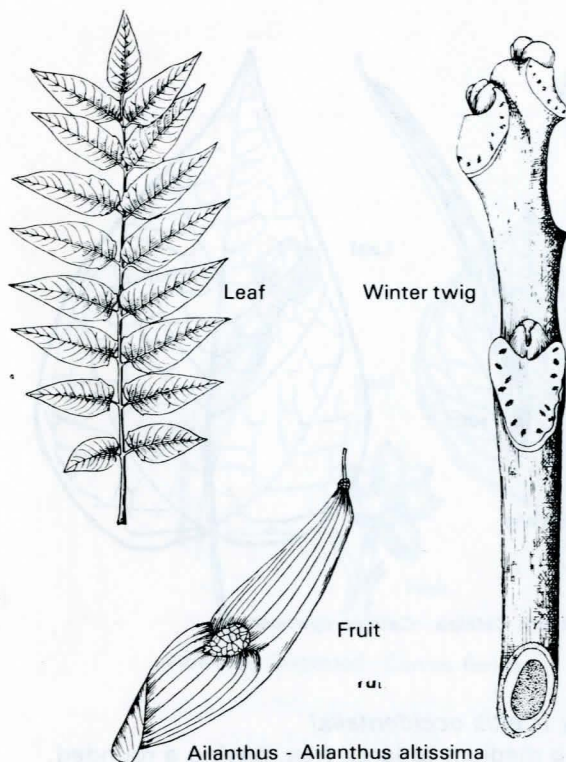
Buds - terminal buds over 1" long, brownish, covered with waxy gum.

Fruit - a thick, leathery, prickly, yellowish-brown, roundish pod, 1" to 2" in diameter, containing 1 to 3 smooth, shining, brown nuts.

Wood - similar to Ohio buckeye.



Horsechestnut - *Aesculus hippocastanum*



Ailanthus or Tree-of-Heaven (*Ailanthus altissima*)

General - not native to Nebraska. Starts readily from seed that is scattered by wind, and from root sprouts. Thrives under almost any type of condition. Resistant to smoke and gases, difficult to get rid of.
Leaves - once pinnately compound, 1' to 3' long with 11 to 41 leaflets, always an odd number of leaflets, ill smelling when crushed.

Twigs - alternate, coarse, more or less velvety or downy, brown pith.

Buds - terminal bud lacking, hemispherical, normally pubescent, relatively small.

Fruit - oblong, spirally twisted wing in center of which is a single, dry seed. Normally occurs in great abundance.

Wood - little information is published. Light colored, brittle.

River Birch (*Betula nigra*)

General - native to extreme eastern Nebraska. Somewhat rare in the north. More common in the southern part of the range where it is the only birch at low elevations. Normally found along streams. Bark salmon-pink, papery.

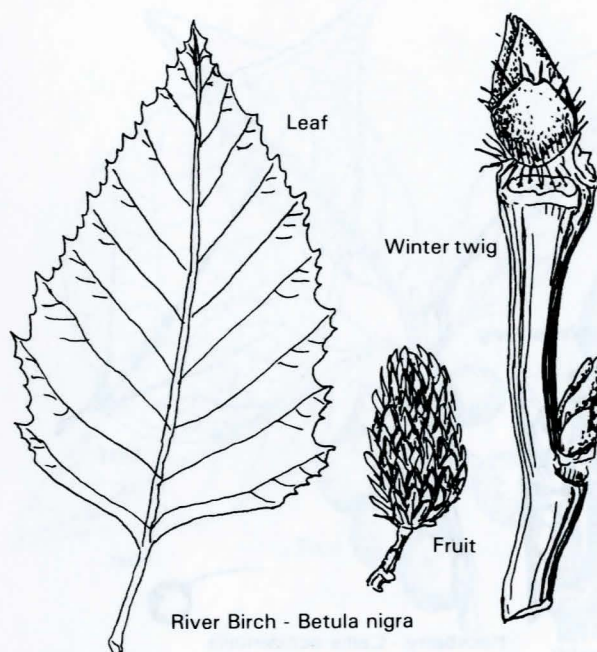
Leaves - simple, doubly serrate, rhombic, wedge-shaped base.

Twigs - alternate, slender, reddish-brown, usually pubescent.

Buds - terminal bud lacking, laterals acute.

Fruit - a cylindrical, erect, pubescent strobile with deciduous scales.

Wood - sapwood whitish to yellowish, heartwood brown, without characteristic odor, growth rings frequently not very distinct (diffuse porous).



Shagbark Hickory (*Carya ovata*)

General - occurs in southeastern Nebraska. Medium-sized tree, slender, tall and straight, with narrow, rounded, open crown of stout branches and twigs. Bark smooth to seamy when young, shagging, flat plates when old.

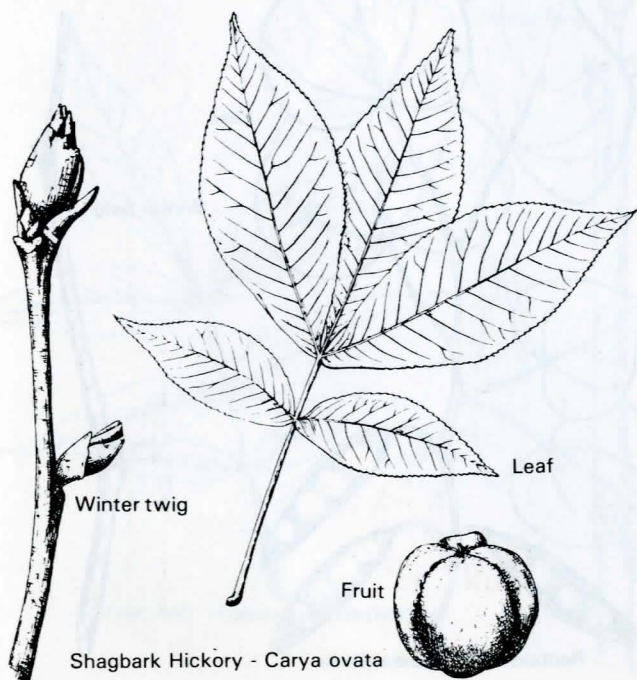
Leaves - once pinnately compound, 6'' to 12'' long, usually 5 leaflets.

Twigs - alternate, stout, smooth and shining to somewhat downy.

Buds - terminal bud present, large, rather blunt-pointed.

Fruit - a nut encased in a 1/4'' to 1/2'' thick husk, total diameter of 1' to 2 1/2'' in diameter, husk splits readily to release globose nut.

Wood - sapwood whitish to light brown, heartwood pale brown to brown, without characteristic odor, growth rings distinct (ring porous or semi-ring porous).



Northern Catalpa (*Catalpa speciosa*)

General - has escaped cultivation and is naturalized in Nebraska. It was planted to be cut down for fence posts.

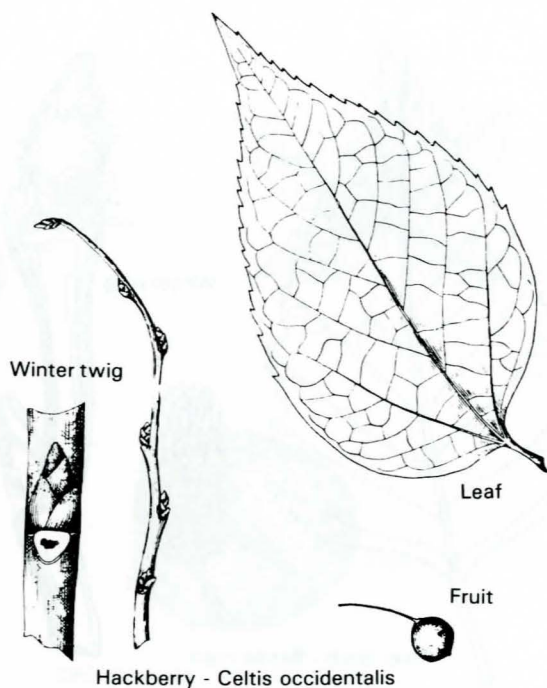
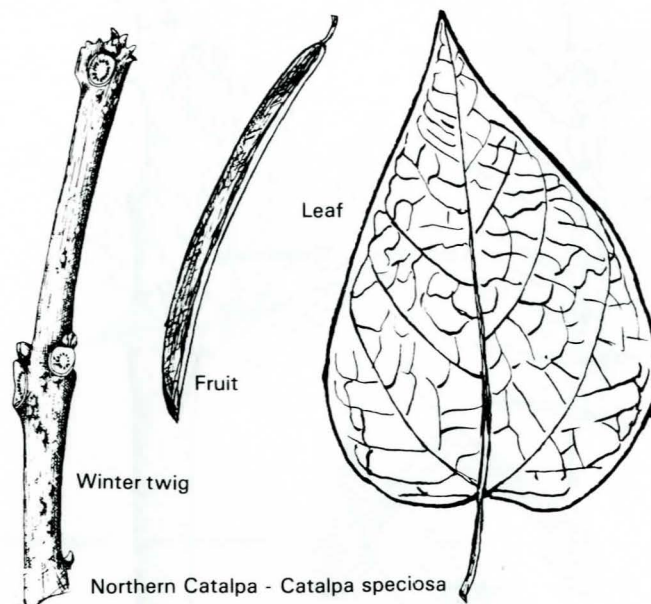
Leaves - simple, heart-shaped, 4'' to 10'' long and 3'' to 8'' wide; entire.

Twigs - opposite or whorled, stout, greenish to purplish, circular leaf scars.

Buds - terminal bud lacking, buds smaller than leaf scars.

Fruit - a long, slender pod 6'' to 15'' long and 1/2'' in diameter.

Wood - sapwood pale gray, heartwood grayish brown, faint aromatic but not characteristic odor, growth rings distinct (ring porous), durable soft.



Hackberry (*Celtis occidentalis*)

General - a medium to large tree, having a rounded, rather wide spreading crown, native to Nebraska, bark on trunk and larger limbs gray and warty.

Leaves - simple, 2'' to 4'' long, serrate, frequently with a long tapering tip, "nipple galls" often occur on underside of leaves.

Twigs - alternate, slender, brownish.

Buds - terminal bud lacking, laterals appressed to twig.

Fruit - 1/4'' in diameter, round, purplish, one per stem, flesh edible.

Wood - sapwood pale yellow to greenish yellow, heartwood yellowish to light brown, without characteristic odor, growth rings distinct (ring porous), rays visible to naked eye.

Redbud or Judas Tree (*Cercis canadensis*)

General - an attractive small, low tree, often with several stout, branches forming a rounded crown. Blooms before the leaves appear in April. Beautiful flowers.

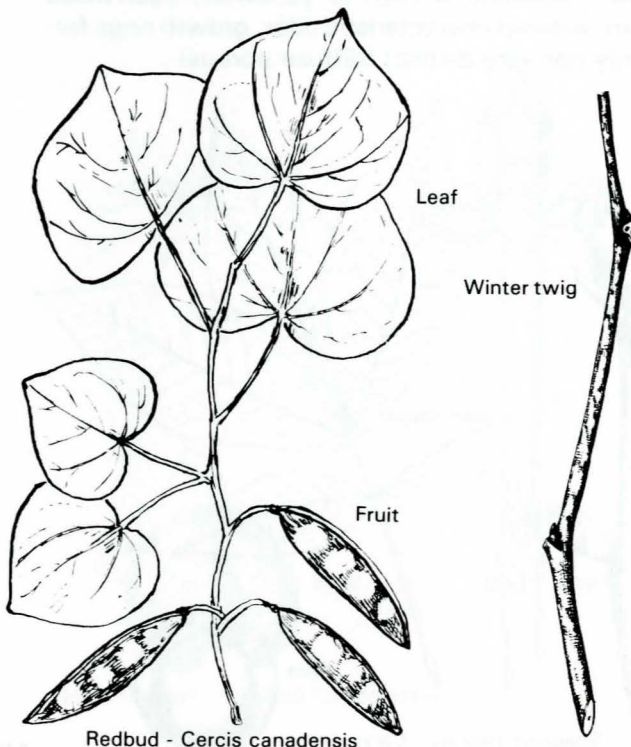
Leaves - simple, heart-shaped, 2'' to 4'' long, entire.

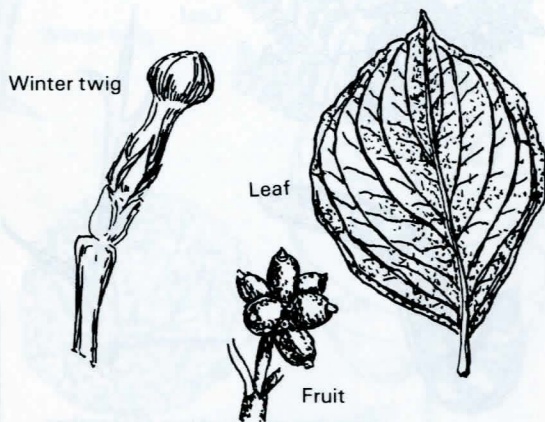
Twigs - alternate, usually zigzag, bark on twigs shiny brown.

Buds - terminal bud lacking, small, blunt, glabrous, purplish.

Fruit - short-stalked, flat, brownish pods 2'' to 4'' long, 1/2'' wide, pointed on both ends, contains 8 to 12 brown, hard seeds.

Wood - little data published, hard, brownish.





Flowering Dogwood - *Cornus florida*

Russian-olive (*Elaeagnus angustifolia*)

General - not native to Nebraska but has been planted extensively.

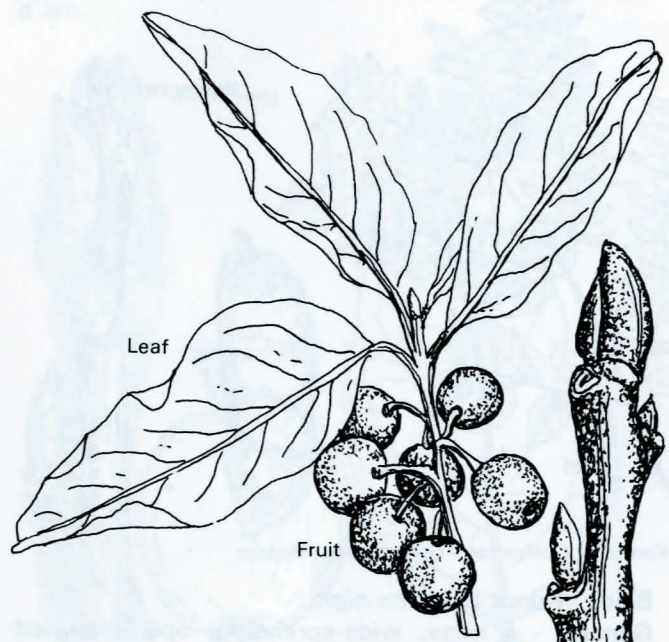
Leaves - simple, silvery, oblong, 1 1/2" to 3" long.

Twigs - alternate, silvery, sometimes with thorns.

Buds - no outstanding characteristics to aid identification.

Fruit - silvery yellow drupe about 1/4" in diameter.

Wood - little data available, yellow to brown.



Russian Olive - *Elaeagnus angustifolia*

Winter twig

Green Ash (*Fraxinus pennsylvanica*)

General - a medium-sized tree with a compact, broad and rounded crown.

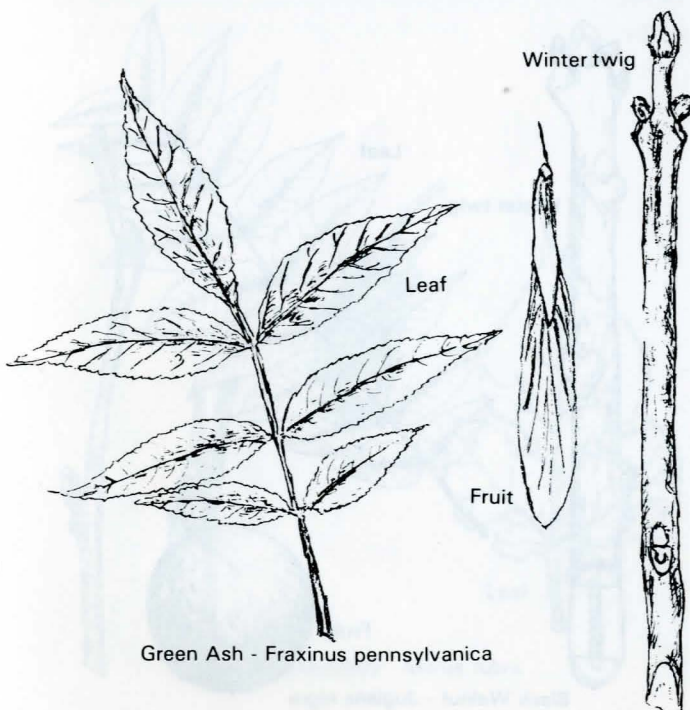
Leaves - once pinnately compound, 8" to 12" long, 5 to 7 leaflets, 1" broad, smooth on both sides, serrate.

Twigs - opposite, medium-slender, gray to brownish.

Buds - rusty brown, smaller and narrower than those of white ash.

Fruit - paddle-shaped in dense clusters, often clinging to twigs into or throughout the winter, 1 1/2" long, 1/4" wide, abruptly narrowed wing along the slender seed cavity.

Wood - sapwood white, heartwood light brown, growth rings distinct (ring porous), without characteristic odor, rays not distinct.



Green Ash - *Fraxinus pennsylvanica*

Honeylocust (*Gleditsia triacanthos*)

General - a medium-sized tree with somewhat drooping lateral branches forming a broad flat-topped head.

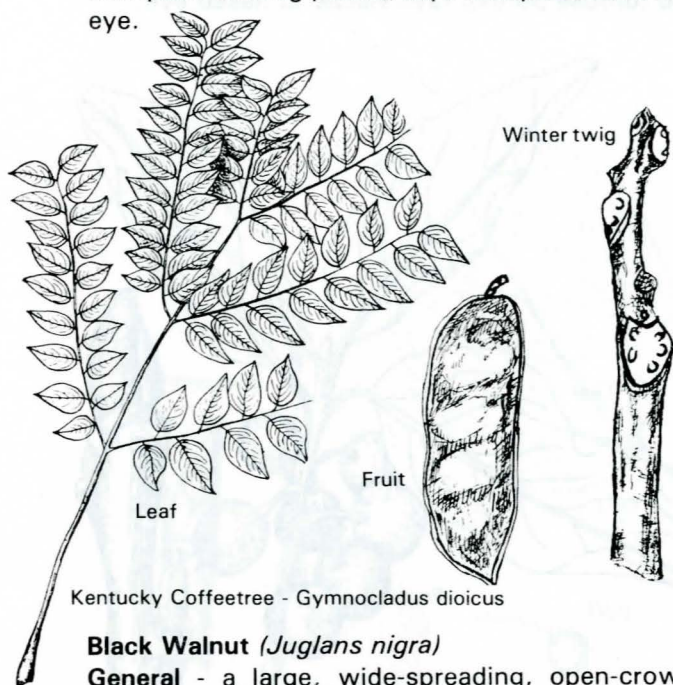
Leaves - both once and twice pinnately compound, once pinnately compound leaves with 15 to 30 nearly sessile leaflets, bipinnate leaves with 4 to 7 pairs of lateral twigs, 6" to 8" long, leaflets 1 1/2" long by 3/4" wide.

Twigs - alternate, stout, smooth, glossy, zigzag, often having stiff, branched thorns from 3" to 6" long, there is a thornless variety.

Buds - terminal bud lacking, superposed, partly sunken in bark.

Fruit - a flat pod, reddish-brown, twisted, 8" to 12" long.

Wood - sapwood yellowish, heartwood reddish brown, without characteristic odor, growth rings conspicuous (ring porus), rays conspicuous to naked eye.



Kentucky Coffeetree - *Gymnocladus dioica*

Black Walnut (*Juglans nigra*)

General - a large, wide-spreading, open-crowned tree with heavy branches and coarse twigs. It prefers rich bottom soil and under favorable conditions attains large size. It is native along the Missouri River and halfway across the state along the Republican and Niobrara Rivers, and has been planted to some extent throughout the state. A very high-valued hardwood.

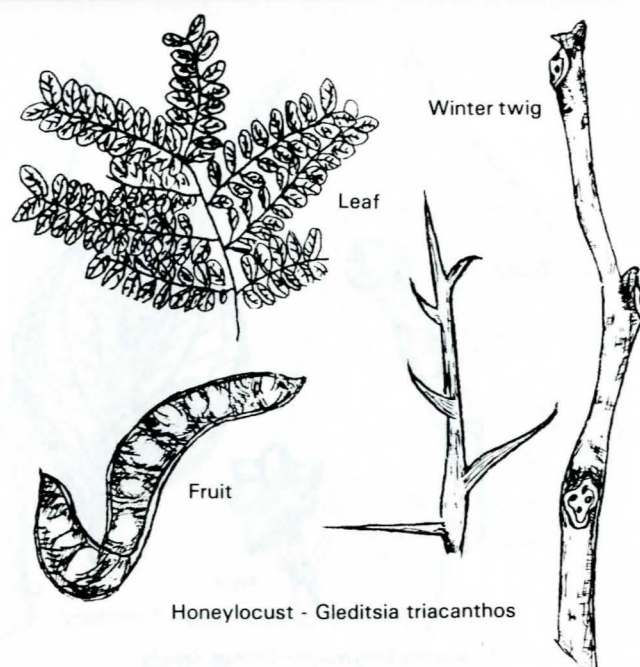
Leaves - compound, 1' to 2' long, with 15 to 23 leaflets, terminal leaflet often missing.

Twigs - alternate, stout, brown, with chocolate-colored chambered pith.

Buds - terminal bud present, short and blunt, larger than laterals.

Fruit - globular nut, 1 3/4" in diameter, covered by a smooth, yellowish-green husk which becomes black.

Wood - sapwood white to light brown, heartwood chestnut-brown, without characteristic odor, growth rings distinct (semi-ring porus), rays indistinct.



Honeylocust - *Gleditsia triacanthos*

Kentucky Coffeetree (*Gymnocladus dioica*)

General - a medium-sized tree with comparatively few large coarse branches.

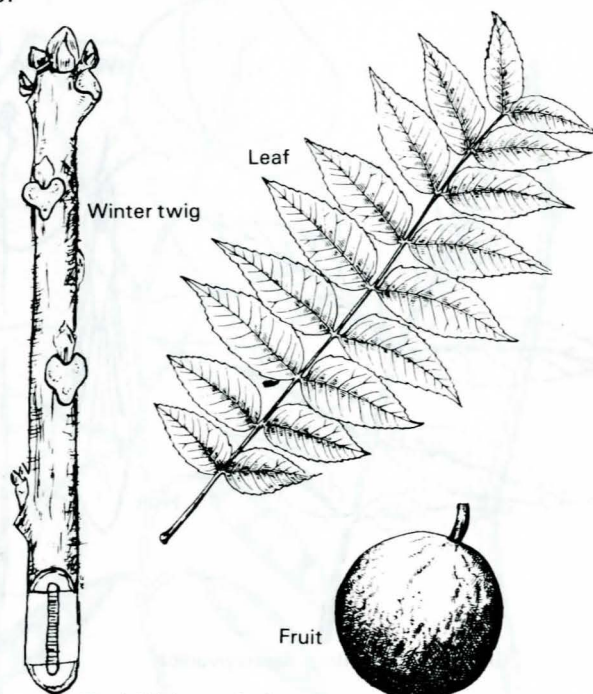
Leaves - twice pinnately compound, very large, 1' to 2' long, 20 to 40 leaflets 1 1/2" long.

Twigs - very stout, blunt, brown and generally white-crusted. Pith is wide and salmon pink.

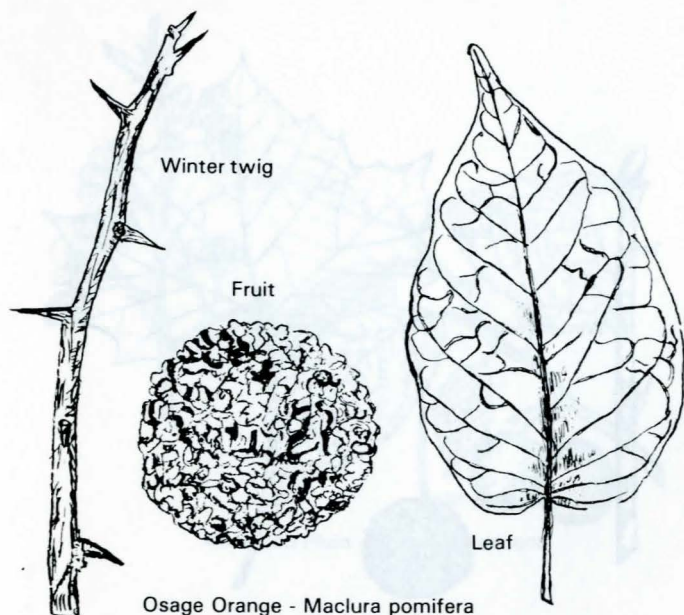
Buds - terminal bud lacking, two or three together, superposed, deeply sunken in the bark.

Fruit - a reddish-brown, leathery, flat, abruptly pointed pod usually 4" to 6" long by 1 3/4" wide, remaining closed until winter, contains 1 to 8 olive-brown, flat, flint-hard seeds imbedded in a sweetish pulp.

Wood - sapwood yellowish, heartwood reddish, without characteristic odor, growth rings conspicuous (ring porus), rays not very conspicuous to naked eye.



Black Walnut - *Juglans nigra*



Osage Orange - *Maclura pomifera*

Apple (*Malus pumila*)

General - not native to Nebraska. Apples are of European or Asiatic origin. Most eating apples are cultivars or varieties that must be grafted.

Leaves - simple, serrate, elliptical to ovate, white pubescent below.

Twigs - alternate, somewhat woolly, characteristic sweet taste.

Buds - terminal bud present, woolly (particularly at tip), blunt, laterals smaller than terminal bud.

Fruit - pome or apple.

Wood - hard, good firewood.

Osage-orange, Hedge Apple, Bois D'arc (*Maclura pomifera*)

General - originally this tree was confined to the rich bottom lands of Arkansas, Oklahoma, and Texas but was extensively planted as a hedge by early Nebraska settlers. In Nebraska the usual height is less than 30 feet.

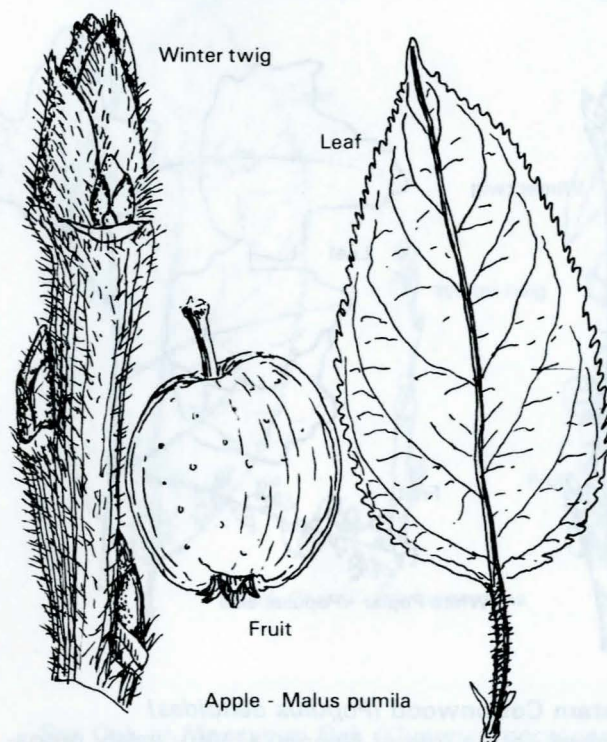
Leaves - simple, entire, 3'' to 5'' long, with a narrow, pointed apex, dark green and shiny above, milky juice.

Twigs - alternate, bright green, hairy, becoming yellowish and armed with stout, sharp-pointed thorns. Bark on roots is bright orange-red.

Buds - terminal bud lacking, small, globular.

Fruit - a pale green orange-like structure 2'' to 4'' in diameter. Seeds brown.

Wood - characteristic bright orange color, yields a yellow dye, used to make bows, thus the name bois d'arc.



Apple - *Malus pumila*

Red Mulberry (*Morus rubra*)

General - a small tree which develops a broad, rounded head with numerous small branches.

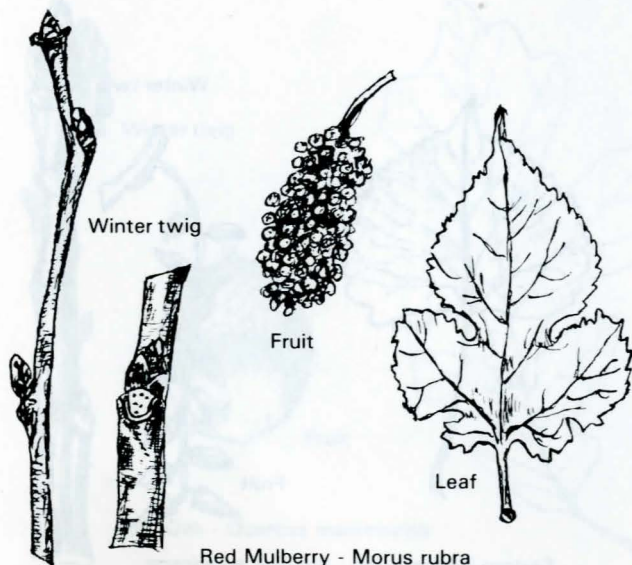
Leaves - simple, variable in shape, may be entire but often 3 to 5 lobes, 2'' to 5'' long, hairy beneath.

Twigs - alternate, slender, somewhat zigzag, reddish to greenish-brown, showing milky sap when cut.

Buds - terminal bud lacking, mostly covered by two-ridged scales.

Fruit - dark purple or nearly black, 1/2'' to 3/4'' long, ripening in June or July.

Wood - sapwood yellowish, heartwood yellow-brown, without characteristic odor, growth rings distinct (ring porus), rays plainly visible to naked eye.



Red Mulberry - *Morus rubra*

American Sycamore or Buttonball-tree (*Platanus occidentalis*)

General - a tall, spreading tree usually found along streams, native along the Missouri River as far north as Omaha. Has been planted in all sections of the state.

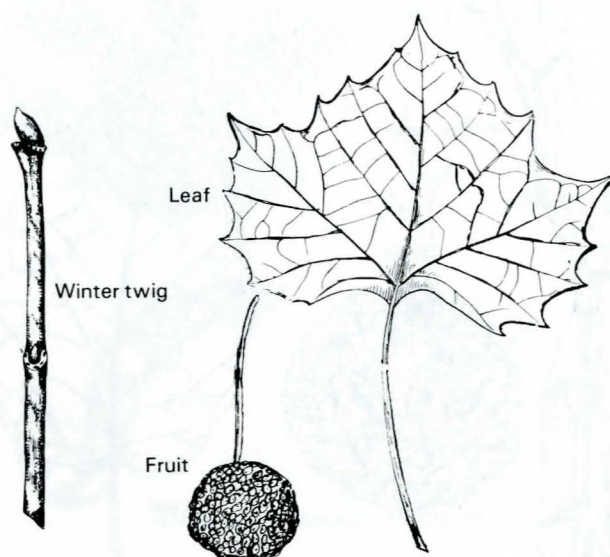
Leaves - simple, 3" to 8" broad, more or less deeply 3 to 5 lobed, bright green.

Twigs - alternate, pale green and hairy when young, smooth and gray when older.

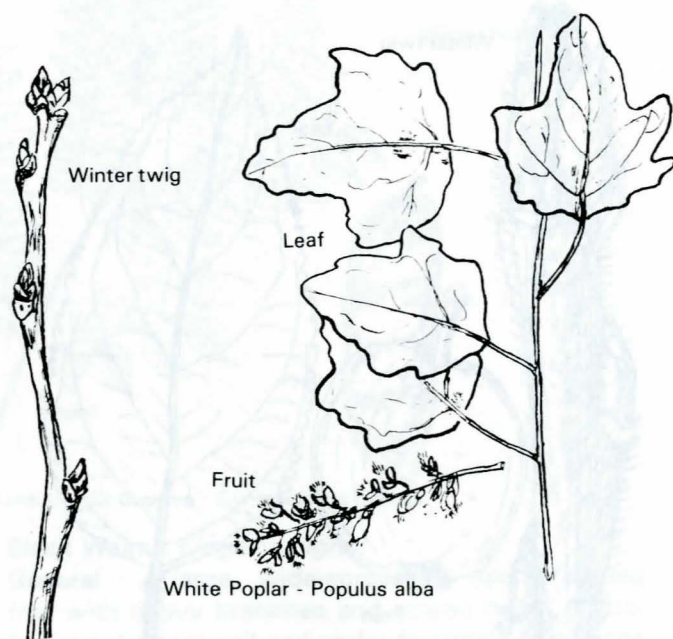
Buds - terminal bud lacking, conical, covered by a single cap-like scale and hidden under hollow base of petiole.

Fruit - round, yellowish-brown ball about 1" in diameter that hangs from slender stem. Often persists throughout winter and into following summer.

Wood - sapwood light yellowish, heartwood light to dark brown, without characteristic odor, growth rings distinct, rays conspicuous to naked eye.



American Sycamore - *Platanus occidentalis*



White Poplar - *Populus alba*

White Poplar (*Populus alba*)

General - introduced from Europe. This is a member of the willow family and is often wrongly called silver maple. It is a large tree, grows rapidly in favorable locations, and also thrives under less favorable conditions. Many root suckers occur about the trees.

Leaves - often resemble a maple leaf in shape, dark green above, white and woolly below, rhombic with very coarse teeth or lobes.

Twigs - alternate, covered with white wooliness.

Buds - terminal bud present, more or less woolly.

Fruit - a small capsule borne in necklacelike strings, seeds very small, capsules contain a large amount of cottony material in addition to seeds.

Wood - little information published, similar to other poplars.

Eastern Cottonwood (*Populus deltoides*)

General - state tree of Nebraska. Very easily propagated by planting a piece of a young branch in moist earth. The Plains Indians used the root wood for starting fires by friction, but as a firewood it burns quickly.

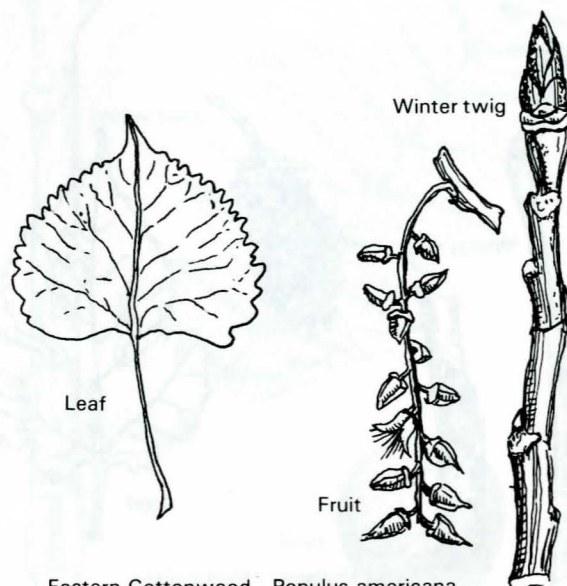
Leaves - simple, rounded teeth, triangular in outline, 2" to 4" long, leaf stem long and flattened.

Twigs - alternate, yellowish-brown, stout, pith 5-angled.

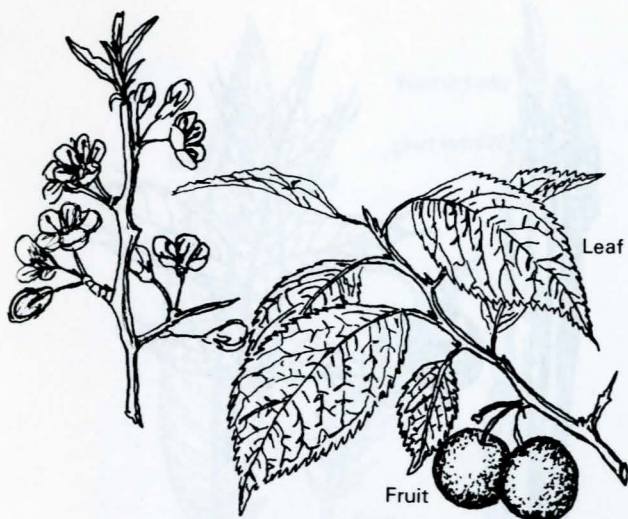
Buds - terminal bud present, brownish, sticky, ovoid.

Fruit - a small, ovoid capsule about 1/3" long, borne like a string of beads, capsule contains many seeds and cottony material, seeds small.

Wood - sapwood whitish, heartwood grayish, often not a clearly defined change from sapwood to heartwood, growth rings distinct but inconspicuous, (diffuse porous), rays not visible without magnification.



Eastern Cottonwood - *Populus americana*



American Plum - *Prunus americana*

American or Wild Plum (*Prunus americana*)

General - widely planted in Nebraska and has escaped into pastures, fields and roadsides. Useful to wildlife.

Leaves - simple, serrate, 3'' to 4'' long, 1 1/2'' wide, oval.

Twigs - alternate, slender, greenish when young becoming darker with age.

Buds - terminal bud present, acute, 1/8'' to 1/4'' long.

Fruit - subglobose, less than 1'' in diameter, bright red when fully ripe, ripens usually from the middle of August to as late as October, edible.

Wood - heavy, hard, dark brown with light colored sapwood.

Black Cherry (*Prunus serotina*)

General - a medium-sized tree attaining a height of 50 feet or more and a diameter of 1 to 2 feet. Native to southeastern Nebraska. Grows along fence rows, in open places and on the edge of timbered areas.

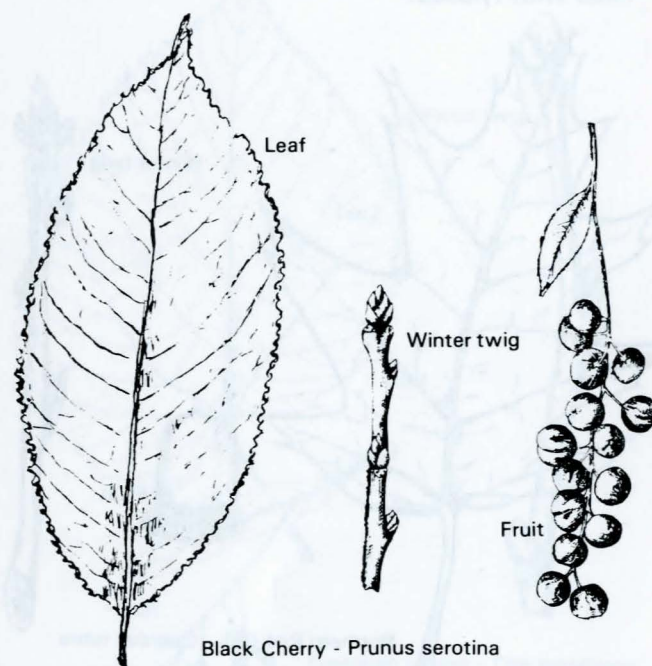
Leaves - simple, about 3'' long and half as broad, dark green and shiny above, paler beneath, finely toothed with incurved teeth, petiole with a conspicuous gland on each side.

Twigs - alternate, slender, usually bitter to taste, red to brown.

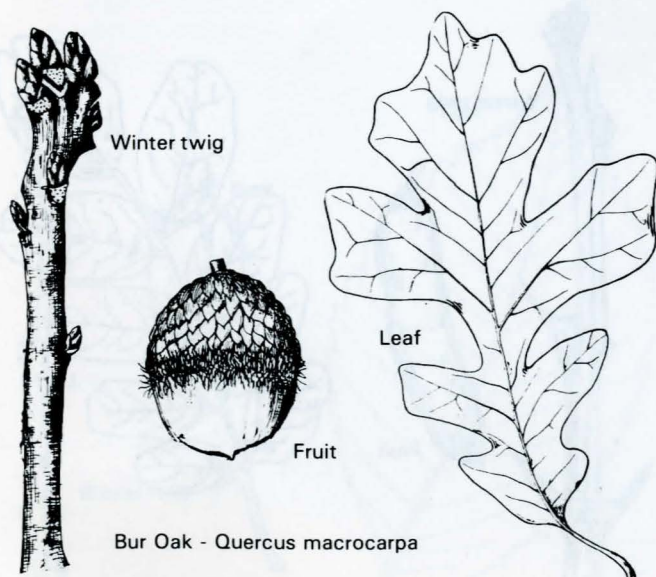
Buds - terminal bud present, laterals same size as terminal, scales imbricate.

Fruit - a dark red nearly black drupe about 1/3'' in diameter.

Wood - sapwood light brown, heartwood light to dark reddish-brown, without characteristic odor, growth rings fairly distinct (semi-ring porus), rays plainly visible to the naked eye.



Black Cherry - *Prunus serotina*



Bur Oak - *Quercus macrocarpa*

Bur Oak or Mossycup Oak (*Quercus macrocarpa*)

General - an important tree species in Nebraska. It is long lived. Valuable as an ornamental and for lumber. A white oak.

Leaves - simple, 5 to 7 rounded lobes, 6'' to 10'' long and 3'' to 5'' wide.

Twigs - alternate, stout, yellowish-brown, becoming ashen or brownish, often with corky ridges.

Buds - terminal bud present, cluster or buds toward the end of the twig, blunt.

Fruit - an acorn, about 1'' long, fringed cup covers 1/2 or more of the acorn, matures in fall of first year.

Wood - sapwood whitish to light brown, heartwood light to dark brown, without characteristic odor, growth rings very distinct (ring porus), rays visible to naked eye, pores normally occluded by tyloses.

Pin Oak (*Quercus palustris*)

General - called pin oak because the trunk is more or less studded with tough lower limbs which do not prune readily. Widely planted as an ornamental. A member of the black oak group.

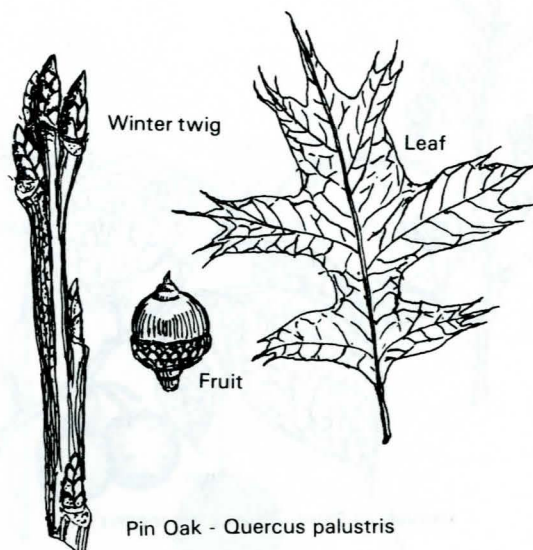
Leaves - simple, 5- sometimes 7- or 9-lobed, 3'' to 5'' long, 2'' to 5'' wide. Sinuses extending 2/3 or more to the midrib, lobes bristle-tipped.

Twigs - alternate, slender, reddish-brown.

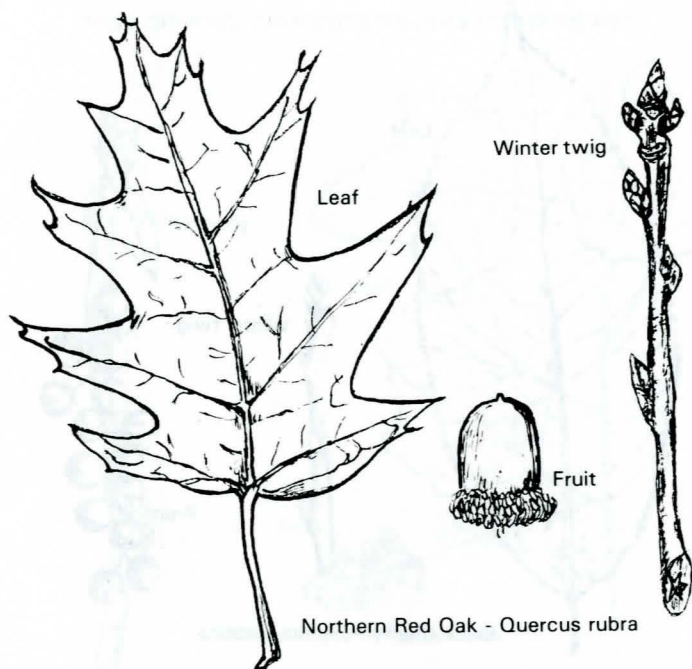
Buds - terminal bud present, 1/8'' long, ovoid, with reddish-brown scales, lateral buds similar but smaller.

Fruit - acorn, 1/2'' long, nearly hemispherical, enclosed only at the base by a thin, saucerlike cup.

Wood - sapwood whitish to pale reddish-brown, heartwood pinkish to light reddish-brown, without characteristic odor, growth rings very distinct (ring porous), rays conspicuous to naked eye, pores not filled with tyloses.



Pin Oak - *Quercus palustris*



Northern Red Oak - *Quercus rubra*

Northern Red Oak (*Quercus rubra*)

General - a large tree of the black oak group whose acorns mature in autumn of the second season. Makes an attractive ornamental tree.

Leaves - simple, 5'' to 9'' long, 4'' to 9'' wide, with coarse-toothed, bristle-tipped lobes, dark green and smooth above, paler beneath.

Twigs - alternate, medium-stout, reddish to greenish-brown.

Buds - terminal bud present, smooth, light chestnut-brown, 1/8'' to 1/4'' long, lateral buds smaller.

Fruit - acorn oblong or nearly round, about 1'' long, reddish-brown, cup shallow, saucer-shaped, usually covering only the base of the acorn.

Wood - sapwood whitish to pale reddish-brown, heartwood pinkish to light reddish-brown, without characteristic odor, growth rings very distinct (ring porous), rays conspicuous to naked eye, pores not filled with tyloses.

Black Locust (*Robinia pseudoacacia*)

General - generally a medium-sized tree belonging to the pea family. A rapid-growing tree. Spreads by means of root suckers. Often severely damaged by locust borer.

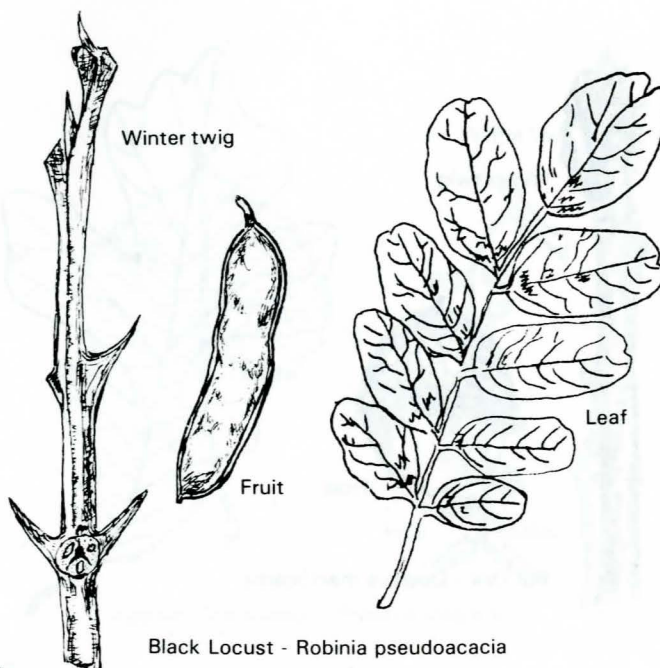
Leaves - once pinnately compound, 6'' to 12'' long, 7 to 19 leaflets.

Twigs - alternate, slender, brittle, often zigzag, generally have short, stiff spines, 1/4'' to 1/2'' long, in pairs at base of leaves.

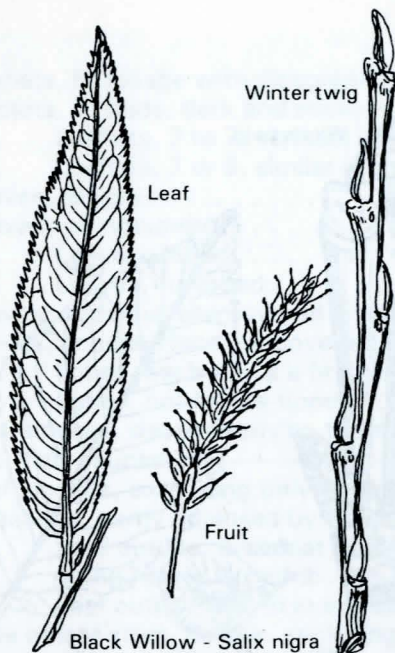
Buds - terminal bud lacking, superposed, hidden under fringe cracks of bark of leaf scar.

Fruit - a dark brown, flat pod, 3'' to 5'' long.

Wood - sapwood yellowish, heartwood yellowish to golden-brown, without characteristic odor, growth rings distinct (ring porous), rays generally visible to the naked eye.



Black Locust - *Robinia pseudoacacia*



American Basswood or American Linden (*Tilia americana*)

General - a large tree with rounded, spreading crown. A native in rich, moist woodlands and along river bottoms in the extreme eastern part of the state.

Leaves - simple, heart-shaped, 2" to 4" long and almost as wide.

Twigs - alternate, usually zigzag, smooth, reddish to gray.

Buds - terminal bud lacking, dark red or greenish, about 1/4" long, lateral buds inequilateral, mucilaginous, usually with two visible scale.

Fruit - subglobose, nutlike, 1/3" to 1/2" in diameter, clustered, bract persistent.

Wood - sapwood whitish to pale brown, heartwood pale brown, with a faint characteristic odor, growth rings fairly distinct (diffuse porus), rays not visible without a hand lens.

Black Willow (*Salix nigra*)

General - native to Nebraska. Usually found on moist soils along the banks of streams. Grows rapidly and matures in 50 to 70 years.

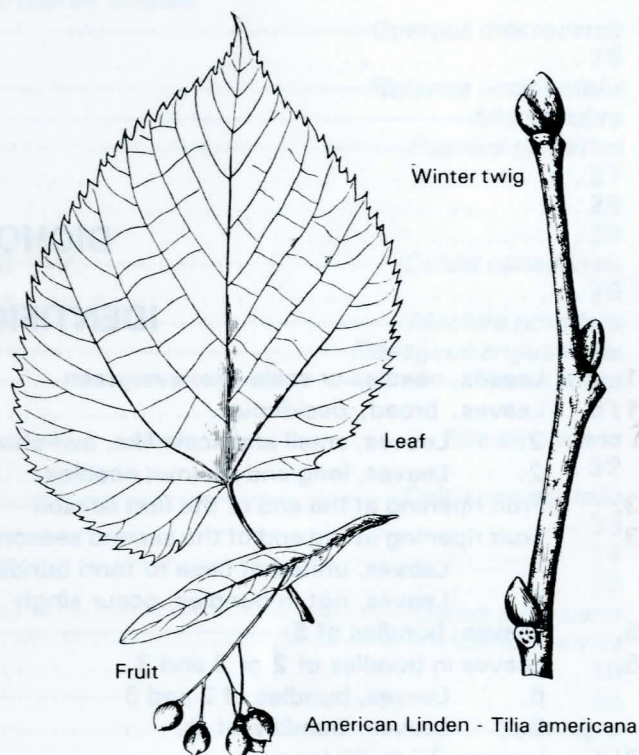
Leaves - simple, serrate, 3" to 6" long, 3/8" to 3/4" wide, lanceolate.

Twigs - alternate, slender to stout, often brittle.

Buds - terminal bud absent, lateral buds appressed, covered by a single cap-like scale.

Fruit - a capsule about 1/4" long, short-stalked, seeds very small.

Wood - sapwood whitish, heartwood light brown to reddish-brown, without characteristic odor, growth rings inconspicuous (diffuse porus), rays barely visible with a hand lens.



American Elm or White Elm (*Ulmus americana*)

General - a large, graceful tree distributed throughout the state. Greatly admired as a lawn and street tree. Subject to Dutch Elm disease.

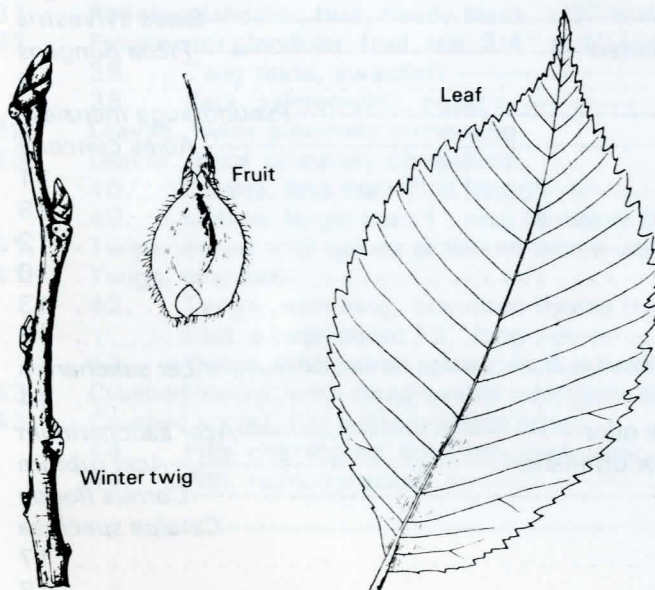
Leaves - simple, 3" to 5" long and half as broad, dark green above, pale and smooth or somewhat hairy below, unequal base.

Twigs - alternate, slender, generally smooth, light reddish-brown.

Buds - terminal bud lacking, lateral buds about 1/4" long, ovoid, not sharp-pointed, characteristic one-sided position above leaf scar.

Fruit - samara, a flat membranous wing about the seed, wing hairy-fringed and notched at tip. Ripens in spring.

Wood - sapwood grayish to light brown, heartwood light brown to brown, without characteristic odor, growth rings distinct (ring porus), rays not distinct to naked eye, cross-section of bark shows corky white layers.



Siberian Elm (*Ulmus pumila*)

General - not native to Nebraska. Much planted throughout Nebraska in shelterbelts. Commonly, but incorrectly, called Chinese elm.

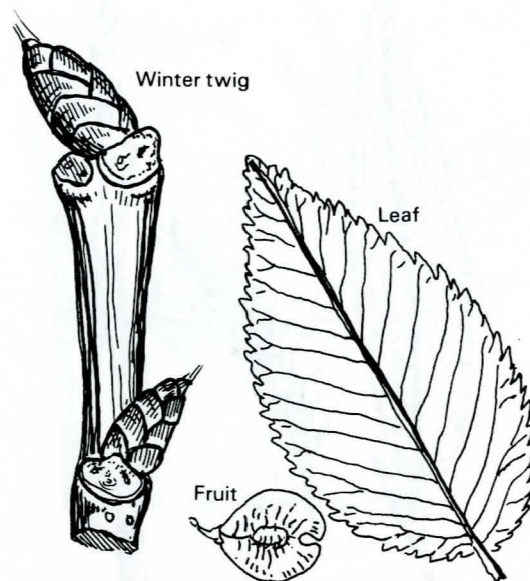
Leaves - simple, usually nearly equal at base, serrate, 1" to 3" long.

Twigs - terminal bud lacking, alternate, gray, slender.

Buds - spherical, bud scale tipped with long hairs.

Fruit - samara, small, about 1/2" long.

Wood - little data published but similar to other elms.



Siberian Elm - *Ulmus pumila*

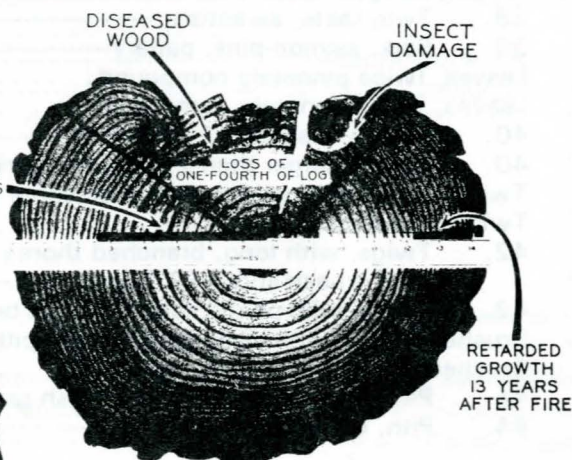
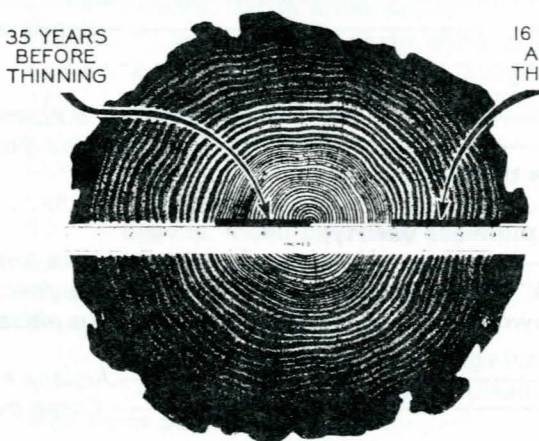
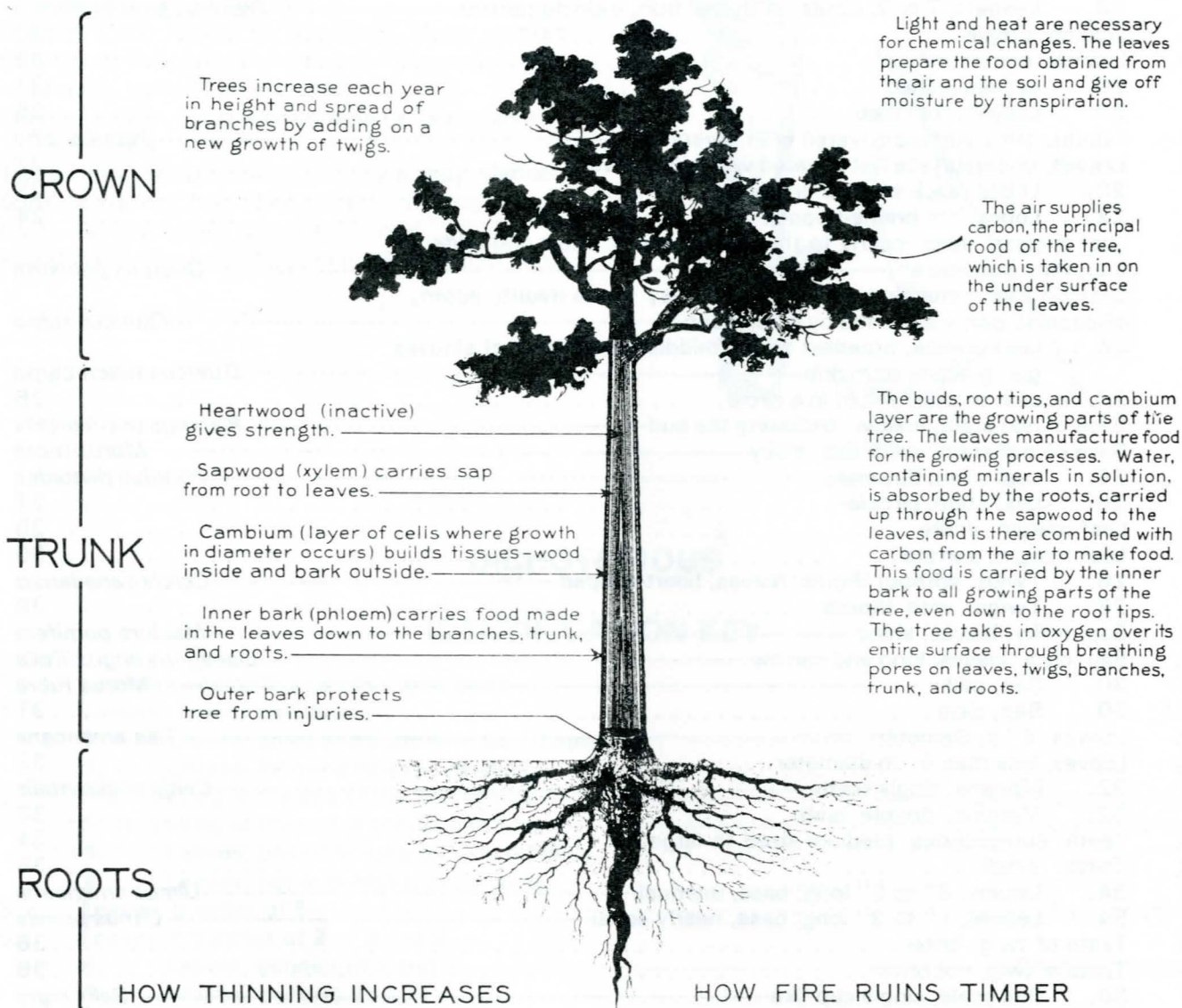
DICHOTOMOUS

IDENTIFICATION KEY

- | | | |
|-----|--|------------------------------|
| 1. | Leaves, needles or scale-like; evergreen | 2 |
| 1. | Leaves, broad; deciduous | 10 |
| 2. | Leaves, small and scale-like, awl-shaped | 3 |
| 2. | Leaves, long and narrow; needles | 4 |
| 3. | Fruit ripening at the end of the first season----- | <i>Juniperus virginiana</i> |
| 3. | Fruit ripening at the end of the second season----- | <i>Juniperus scopulorum</i> |
| 4. | Leaves, united at base to form bundles | 5 |
| 4. | Leaves, not in bundles, occur singly | 8 |
| 5. | Leaves, bundles of 5----- | <i>Pinus strobus</i> |
| 5. | Leaves in bundles of 2 or 2 and 3 | 6 |
| 6. | Leaves, bundles of 2 and 3----- | <i>Pinus ponderosa</i> |
| 6. | Leaves, bundles of 2 | 7 |
| 7. | Leaves, 3" to 6" long----- | <i>Pinus nigra</i> |
| 7. | Leaves, 2" long----- | <i>Pinus sylvestris</i> |
| 8. | Leaves, 4-sided in cross-section, sharp pointed----- | <i>Picea pungens</i> |
| 8. | Leaves, flat in cross-section | 9 |
| 9. | Leaves, 1" long, petioled; buds, sharp-pointed----- | <i>Pseudotsuga menziesii</i> |
| 9. | Leaves, 2 1/2" long, sessile; buds, subglobose----- | <i>Abies concolor</i> |
| 10. | Leaves, opposite or in 3's | 11 |
| 10. | Leaves, alternate | 19 |
| 11. | Leaves, simple | 12 |
| 11. | Leaves, compound | 16 |
| 12. | Leaves, lobed palmately | 13 |
| 12. | Leaves, not lobed | 15 |
| 13. | Margins of lobes not toothed, 5-lobed----- | <i>Acer saccharum</i> |
| 13. | Margins definitely toothed | 14 |
| 14. | Leaves, 5-lobed; bruised twigs have a rank odor----- | <i>Acer saccharinum</i> |
| 14. | Leaves, normally 3-lobed; bruised twigs not offensive----- | <i>Acer rubrum</i> |
| 15. | Side veins parallel leaf margin----- | <i>Cornus florida</i> |
| 15. | Leaves, heart-shaped, whorls of 3----- | <i>Catalpa speciosa</i> |
| 16. | Leaves, palmately compound | 17 |
| 16. | Leaves, pinnately compound | 18 |

17.	Leaflets, 5; foliage with disagreeable odor-----	<i>Aesculus glabra</i>
17.	Leaflets, 7; buds, dark and sticky-----	<i>Aesculus hippocastanum</i>
18.	Leaflets, 3 to 7, variable in shape; fruit, a double samara-----	<i>Acer negundo</i>
18.	Leaflets, 7 or 9, similar in shape; fruit, a single samara-----	<i>Fraxinus pennsylvanica</i>
19.	Leaves, simple	20
19.	Leaves, compound	39
20.	Leaves, lobed	21
20.	Leaves, unlobed	26
21.	Leaves, undersurface covered with silvery wool-----	<i>Populus alba</i>
21.	Leaves, undersurface not covered with silvery wool	22
22.	Lobes, each bears a bristle-tip	23
22.	Lobes, not bristle-tipped	24
23.	Leaf sinuses, deep, nearly to the midrib; acorn, short and wide; cup, flat, saucerlike-----	<i>Quercus palustris</i>
23.	Leaf sinuses, extending only about halfway to the midrib; acorn, ellipsoidal, partly enclosed by a deep cup-----	<i>Quercus rubra</i>
24.	Leaf outline, broadest above middle; center pair of sinuses going nearly to midrib-----	<i>Quercus macrocarpa</i>
24.	Leaf outline, will fit in a circle	25
25.	Base of leaf stem, hollow, enclosing the bud-----	<i>Platanus occidentalis</i>
25.	Base of leaf stem, solid; sap, milky-----	<i>Morus rubra</i>
26.	Leaf stem, flattened-----	<i>Populus deltoides</i>
26.	Leaf stem, circular	27
27.	Leaf margin, entire	28
27.	Leaf margin, serrate	30
28.	Twigs, without thorns; leaves, heart-shaped-----	<i>Cercis canadensis</i>
28.	Twigs, with thorns	29
29.	Sap, milky; leaves, shiny-----	<i>Maclura pomifera</i>
29.	Sap, clear; leaves, long and narrow-----	<i>Elaeagnus angustifolia</i>
30.	Sap, milky-----	<i>Morus rubra</i>
30.	Sap, clear	31
31.	Leaves, 4" in diameter-----	<i>Tilia americana</i>
31.	Leaves, less than 4" in diameter	32
32.	Margins, single teeth-----	<i>Celtis occidentalis</i>
32.	Margins, double teeth	33
33.	Teeth, conspicuous, medium-sized to large	34
33.	Teeth, small	35
34.	Leaves, 3" to 5" long; base, unequal-----	<i>Ulmus americana</i>
34.	Leaves, 1" to 3" long; base, nearly equal-----	<i>Ulmus pumila</i>
35.	Taste of twig, bitter	36
35.	Taste of twig, not bitter	38
36.	Bud scale, single cap-like-----	<i>Salix nigra</i>
36.	Bud scales, 2 or more	37
37.	Petiole, glandular; fruit, nearly black, 1/3" in diameter-----	<i>Prunus serotina</i>
37.	Petiole, not glandular; fruit, red, 3/4" to 1" in diameter-----	<i>Prunus americana</i>
38.	Twig taste, sweetish-----	<i>Malus pumila</i>
38.	Bark, salmon-pink, papery-----	<i>Betula nigra</i>
39.	Leaves, twice pinnately compound	40
39.	Leaves, once pinnately compound	41
40.	Leaves, less than 1' in length-----	<i>Gleditsia triacanthos</i>
40.	Leaves, larger than 1', may be nearly 3'-----	<i>Gymnocladus dioica</i>
41.	Twigs, armed with spines or thorns (some varieties are thornless)	42
41.	Twigs, unarmed	43
42.	Twigs, with long, branched thorns (except in thornless variety); fruit, a bean about 12" long-----	<i>Gleditsia triacanthos</i>
42.	Twigs, with paired spines; fruit, a bean about 3" long-----	<i>Robinia pseudoacacia</i>
43.	Crushed leaves, with disagreeable odor; pith, large, brownish-----	<i>Ailanthus altissima</i>
43.	Crushed leaves, not a disagreeable odor	44
44.	Pith, chambered, light yellowish-gray-----	<i>Juglans nigra</i>
44.	Pith, homogeneous-----	<i>Carya ovata</i>

HOW A TREE GROWS



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