Recommended Alternatives to Ash Trees for Michigan's Lower Peninsula

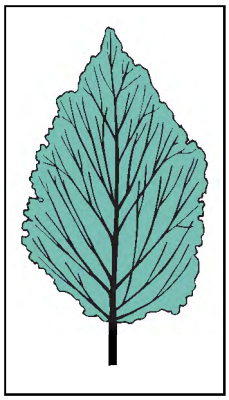
Bert Cregg and Robert Schutzki
Michigan State University
Department of Horticulture and Department of Forestry

MICHIGAN STATE UNIVERSITY EXTENSION

Emerald Ash Borer

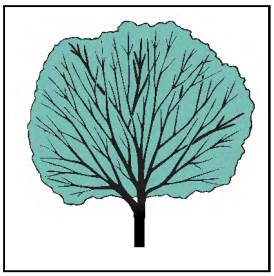
This guide gives suggestions for species that should be considered in situations where a homeowner, landscaper, or urban forester may have planted an ash in the past. General species characteristics, mature form and size, and other noteworthy characteristics are given; all are hardy to at least zone 5. Diversity of species is also important. Look around you, and plant a variety trees.

'Autumn blaze' Freeman maple *Acer x freemanii*



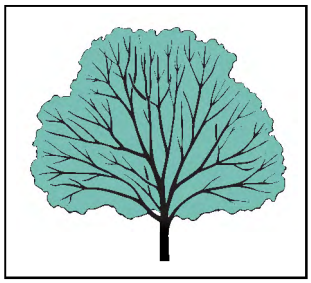
Height: 50-55 ft.
Spread: 30-40 ft.
Site preferences: Zone 4-7. Prefers moist soil but is drought tolerant. pH: adaptable. Fast growing.
Ornamental characteristics: Shape: oval-rounded. Foliage has excellent orange-red fall color.
Insect/disease factors: None serious.
Cultivars: Marmo, Sienna Glen

Hedge maple *Acer campestre*



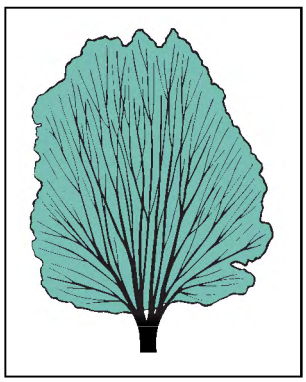
Height: 25-30 ft.
Spread: 25-30 ft.
Site preferences: Zone 5a-8b. Sun to partial shade. Tolerates drought. Moderate salt tolerance. pH: 5.0-8.2. Adapted to compaction, severe pruning.
Ornamental characteristics: Shape: round. Excellent residential use under utility lines. Easily transplanted in spring or fall. Cultivars: 'Queen Elizabeth' (more upright, vigorous [zone 6b-7b]); 'Schichtel's Upright' (5b-8b). Introduced from Europe, Near East and Africa.
Insect/disease factors: Occasional problems with verticillium wilt.

Trident maple *Acer buergeranum*



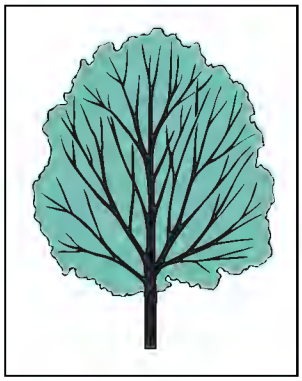
Height: 20-25 ft.
Spread: 20-35 ft.
Site preferences: Zone 5b or 6a-8a. Prefers full sun. Adapted to urban conditions. Moderate salt tolerance. Tolerates moderate drought. pH: 5.0-7.0.
Ornamental characteristics: Shape: round. Mottled bark, shedding with age; dense, dark green leaves turning orange to red in the fall. Introduced from China.
Insect/disease factors: None serious.

Miyabe maple *Acer miyabei*



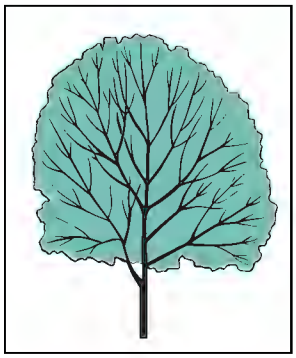
Height: 30-40 ft.
Spread: 20-30 ft.
Site preferences: Zone 4-7. Moist, well-drained soil. pH: adaptable.
Ornamental characteristics: Shape: rounded.
Insect/disease factors: None serious.
Cultivars: 'State Street' — fast growing, upright oval habit, dark green leaves with yellow fall color, corky bark.

Norway maple *Acer platanoides*



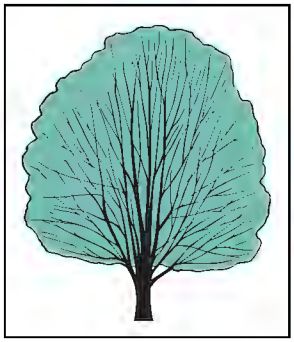
Height: 40-50 ft.
Spread: 30-50 ft.
Site preferences: Zone 4-7. Prefers moist soils and will tolerate clay (but not wet) soil. pH: very adaptable.
Ornamental characteristics: Shape: rounded. Foliage is dark green with occasionally good yellow fall color.
Insect/disease factors: Verticillium wilt and anthracnose.
Cultivars: 'Crimson King' — reddish purple foliage; 'Columnare' — narrow oval habit (20-ft. spread); 'Summershade' — fast growing, heat resistant; 'Easy Street' — narrow oval.

Red maple *Acer rubrum*



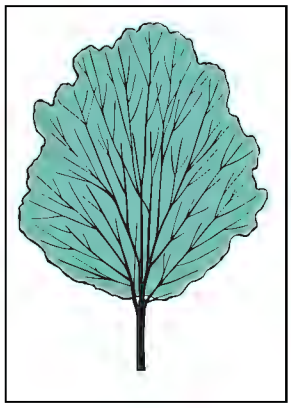
Height: 40-60 ft.
Site preferences: Zone 3b-9a. Moist soils necessary; flood tolerance of specific cultivars is listed below. Salt sensitive. pH: 5.0-7.0 (chlorosis occurs at high pH).
Ornamental characteristics: Shape: round, upright. Good fall color.
Insect/disease factors: Leafhopper and borers.
Cultivars: 'Autumn Flame' (early, low flood tolerance, persistent red fall color, zone 3b); 'Northwood' (low flood tolerance, good orange-red fall color, zone 3b); 'October Glory' (intermediate flood tolerance, excellent red fall color, zone 5a); 'Red Skin' (large, thick foliage, early reddish maroon fall color, rare, zone 4); 'Red Sunset'. Transplant in spring, high flood tolerance, specify "own-rooted" — graft incompatibility can be a problem. 'Redpointe' — pyramidal with dominant central leader.

Sugar maple *Acer saccharum*

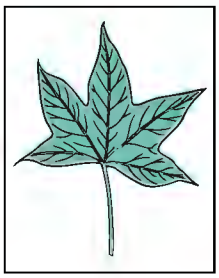


Height: 60-80 ft.
Spread: 40-50 ft.
Site preferences: Zone 4-8. Prefers moist, well-drained soil. pH: neutral to slightly acidic.
Ornamental characteristics: Shape: oval to rounded. Good fall color of yellow, orange or red.
Insects/disease factors: verticillium wilt, leaf scorch.
Cultivars: 'Crescendo' — dark green foliage with good orange-red fall color, heat and drought tolerant; 'Green Mountain' — thick, dark green leaves that resist leaf scorch, yellow fall color; 'Legacy' — thick and glossy dark green leaves, drought tolerant, yellow-orange fall color.

Shantung maple *Acer truncatum*

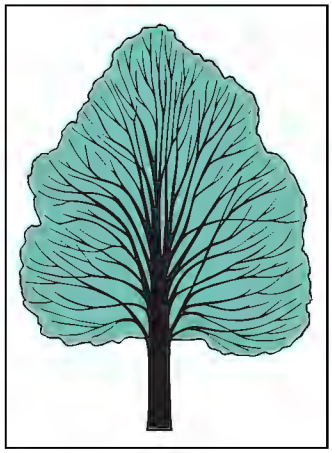


Height: 25-30 ft.
Spread: 20-30 ft.
Site preferences: Zone 5a-7b (species is variable; hybrid cultivars, zone 5). Requires moist, well-drained site; tolerates moderate drought. Moderate salt tolerance. pH: 5.0-8.2. Resistant to leaf scorch.
Ornamental characteristics: Shape: round. Dark green, glossy leaves with early fall color of yellow-orange to bright red.



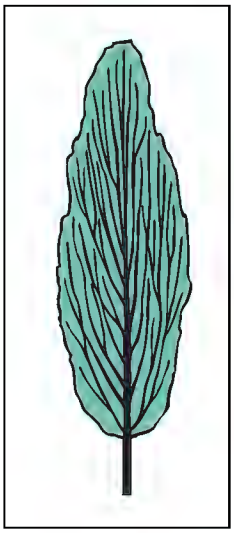
Cultivars: Hybrids of *A. platanoides* are 'Norwegian Sunset' (upright round, orange-red to red fall color, more heat and drought tolerant than *A. platanoides*) and 'Pacific Sunset' (upright oval, finer branched and earlier red fall color than 'Norwegian Sunset').
Insect/disease factors: None serious.

Horse chestnut *Aesculus hippocasteana*



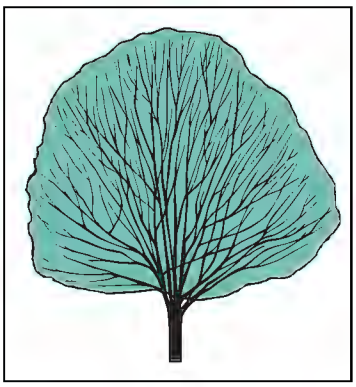
Height: 50 ft. -75 ft.
Spread: 40 ft. -70 ft.
Site preferences: Zone 4-8. Prefers moist, well-drained soils. pH: adaptable.
Ornamental characteristics: Shape: rounded. Other: showy white flowers in mid-May.
Insect/disease factors: Leaf scorch can occur under hot/dry conditions in late summer.
Cultivars: 'Baumanii' more showy with longer lasting flowers and seedless.

Upright European hornbeam *Carpinus betulus 'Fastigiata'*



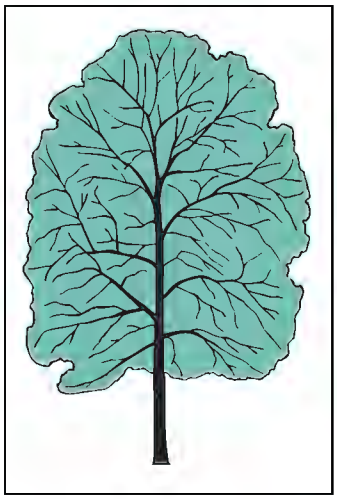
Height: 35 ft.
Spread: 25 ft.
Site preferences: Zone 5a-7a. Tolerates drought, heavy soil. Salt sensitive. pH: 5.0-8.2.
Ornamental characteristics: Shape: narrow when young, becoming oval; narrow branching angles.
Insect/disease factors: Canker, leaf spot and twig blight can occur if the tree is stressed.
Additional: Transplant in spring; somewhat slow to establish from bare root.

American hornbeam *Carpinus caroliniana*



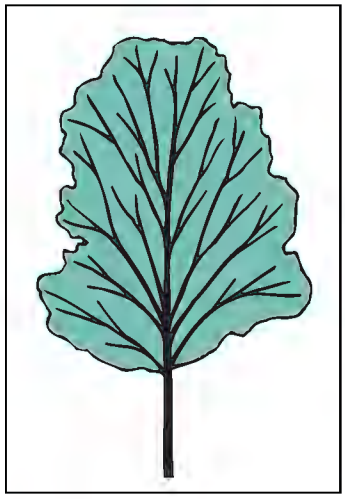
Height: 20-30 ft.
Spread: 20-30 ft.
Site preferences: Zone 3b-9a. Prefers moist soil but will tolerate some intermittent drought. pH: 5.0-8.2. Prefers shaded, moist soils.
Ornamental characteristics: Shape: round, spreading. "Muscled" bark, good orange-red fall color, clumps or single stem.
Insect/disease factors: Relatively pest and disease free, requires little maintenance, though damage by ice storms can be a problem. Cankers can occur with specimens of southern origin, so it is important to know the source of the tree.
Additional: Transplant in spring; somewhat slow to establish. Native to Michigan and eastern United States.

Hackberry *Celtis occidentalis*



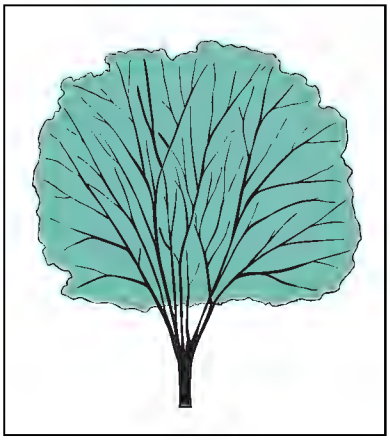
Height: 40-60 ft.
Spread: 30 ft.
Site preferences: Zone 3b-8b. Tolerates drought. Salt sensitive. pH: 5.0-8.2. Tolerates light shade, wind, heat.
Ornamental characteristics: Shape: pyramidal when young; open, irregular when mature, with dark green, leathery leaves.
Insect/disease factors: Witch's broom and insect galls (aesthetic but not life-threatening problems).
Cultivars: 'Prairie Pride' (rapid, compact grower; thick, leathery foliage).
Additional: Transplant in spring; somewhat slow to establish.

Katsura tree *Cercidiphyllum japonicum*



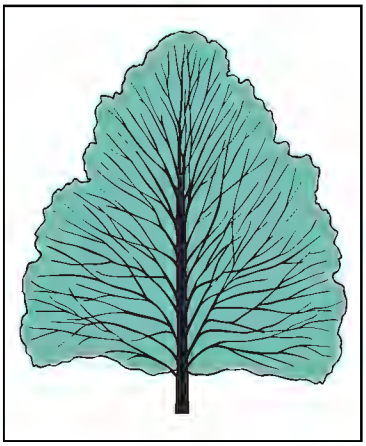
Height: 40 ft.
Spread: 40 ft.
Site preferences: Zone 5a-9a. Requires evenly moist soils; not drought tolerant. pH: 5.0-8.2. Does not tolerate compaction or heavy soils; tolerates light shade. Protected site best.
Ornamental characteristics:
Shape: upright, pyramidal when young, becoming rounded with age.
New leaves are bright red when unfolding; good yellow fall color; dry leaves have caramel scent; clump or single stem.
Insect/disease factors: None serious.

Yellowwood *Cladrastis kentukea*



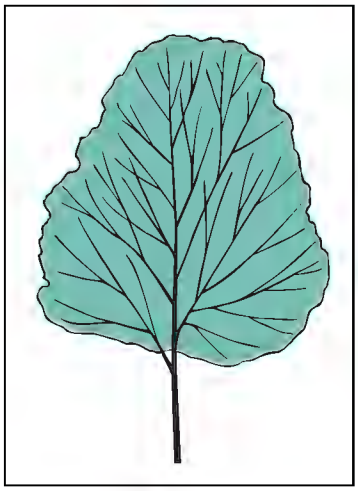
Height: 30 ft.
Spread: 40 ft.
Site preferences: Zone 4b-8a. Best in moist, well- drained soils; not drought tolerant. pH: 5.0-8.2.
Ornamental characteristics: Shape: round. Bright green foliage; showy, fragrant flowers in late spring.
Insect/disease factors: None.
Additional: Prune only in summer — profuse bleeding will occur at other times of the year. Specify single leader — can be weak-wooded with poor crotch angles that split out as the trees grow older. Transplant in spring.

Turkish filbert *Corylus colurna*



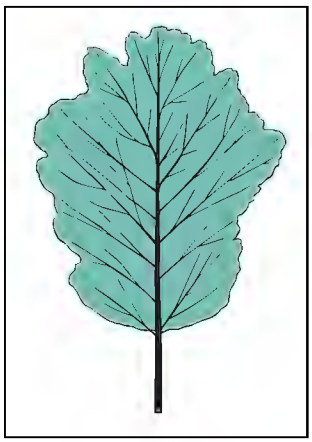
Height: 40-50 ft.
Spread: 20-30 ft.
Site preferences: Zone 4-7. Drought tolerant once established. pH: adaptable.
Ornamental characteristics: Shape: broad pyramidal, maintains formal shape. Other: attractive dark green foliage.
Insect/disease factors: None serious.
Additional: This is a low-maintenance but attractive species that is quite underused.

Hardy rubber tree *Eucommia ulmoides*



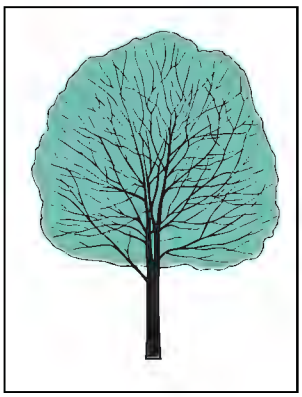
Height: 40-60 ft.
Spread: 45 ft.
Site preferences: Zone 5b-8.2. Tolerates drought; intolerant of poor drainage.
pH: 5.0-8.2. Tolerates heat; needs full sun.
Ornamental characteristics: Shape: round, wide, spreading with ascending branches. Glossy green foliage.
Insect/disease factors: None.
Additional: Transplants easily in spring or fall.

Gingko *Gingko biloba*



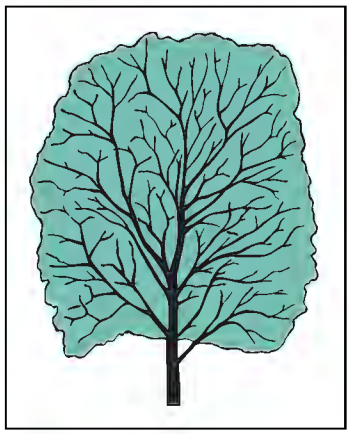
Height: 40-50 ft.
Spread: Variable, depending on cultivar.
Site preferences: Zone 4b-8b. Tolerates drought. Moderate salt tolerance. pH: 5.0-8.2.
Ornamental characteristics: Shape: irregular when young, becoming pyramidal with age. Yellow fall color.
Cultivars: 'Autumn Gold' (symmetrical, broad, outstanding fall color); 'Lakeview'; and 'Princeton Sentry' (very narrow upright); 'Presidential Gold' (broadly oval, well branched).
Additional: Specify male trees because of noxious fruit smell (all cultivars are male). Transplant in spring or fall.
Insect/disease factors: None serious.

Thornless honeylocust *Gleditsia triacanthos inermis*



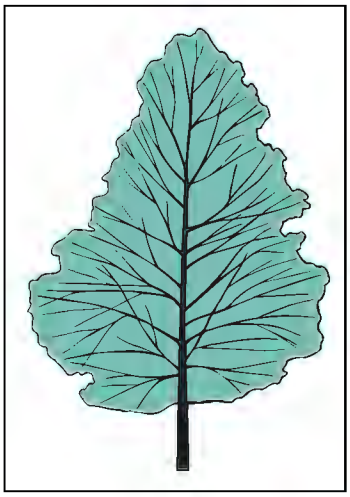
Height: 40-100 ft.
Spread: 40 ft.
Site preferences: Zone 4b-9a. Tolerates wet and dry sites. High salt tolerance. pH: 5.0-8.2.
Ornamental characteristics: Shape: Open, spreading.
Insect/disease factors: Overplanting has encouraged severe insect problems in many areas (honeylocust plant bug, spider mite, borer, webworm).
Cultivars: 'Shademaster' (high, vase-shaped canopy, essentially fruitless); 'Skyline' (upright, pyramidal, strong central leader, good fall color); 'Northern Acclaim' (most cold hardy, good form).
Additional: Transplants easily in spring. 'Inermis' refers to the thornless selection.

Kentucky coffee tree *Gymnocladus dioicus*



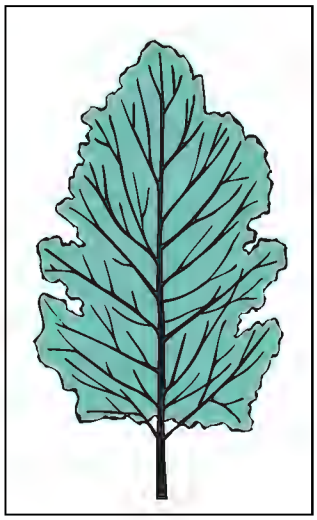
Height: 60-75 ft.
Spread: 40-50 ft.
Site preferences: Zone 3b-8. Drought tolerant after establishment. pH: adaptable.
Ornamental characteristics: Shape: oval crown with irregular branching. Foliage is dark green with compound leaves; can sometimes have a good yellow fall color.
Insect/disease factors: None serious.
Cultivars: 'Prairie Titan' — nice branching habit and blue-green summer foliage. 'Espresso' — seedless, good form.

Sweetgum *Liquidambar styraciflua*



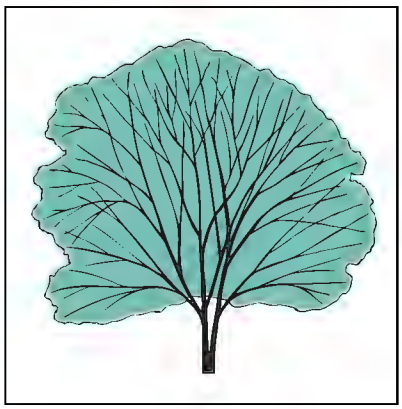
Height: 70-100 ft.
Spread: 40-65 ft.
Site preferences: Zone 5b-9a. Tolerates intermittent flooding, moderate drought. pH: 5.0-7.5. Best on moist, sunny sites.
Ornamental characteristics: Shape: pyramidal when young, becoming round with age. Excellent fall color. Fruit litter may be objectionable.
Insect/disease factors: None serious.
Cultivars: 'Moraine' (most cold hardy, zone 4b, bright red fall color); 'Rotundaloba' (fruitless, not as hardy); 'Worplesdon' (orange-red fall color, broadly pyramidal to oval).
Additional: Northern seed source recommended. Transplant in spring. Iron chlorosis can occur.

Tulip tree *Liriodendron tulipifera*



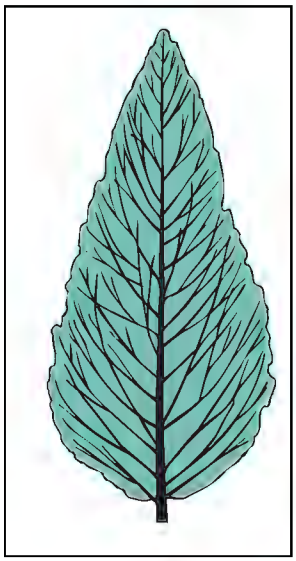
Height: 80-120 ft.
Spread: 35-50 ft.
Site preferences: Zone 5a-9a. Requires evenly moist soils but does not tolerate poor drainage. Needs adequate space. Salt sensitive. pH: 5.0-8.2.
Ornamental characteristics: Shape: broad pyramidal. Yellow fall color. Somewhat weak-wooded.
Insect/disease factors: Occasional problems with leaf scorch, canker, and verticillium wilt.
Additional: Transplant in spring. Northern seed source recommended.

Amur maackia *Maackia amurensis*



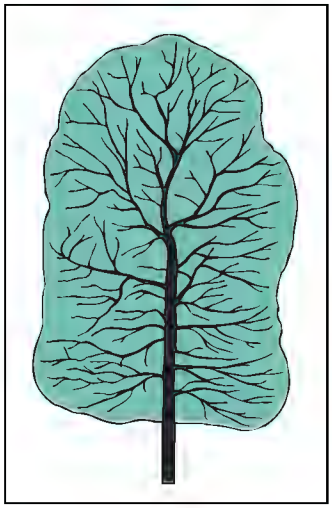
Height: 20-30 ft.
Spread: 30 ft.
Site preferences: Zone 4-7. Moist, well-drained soil. pH: adaptable.
Ornamental characteristics: Shape: rounded. White flowers in June; copper-brown, peeling, attractive bark.
Insect/disease factors: None serious.

Dawn redwood *Metasequoia glyptostroboides*



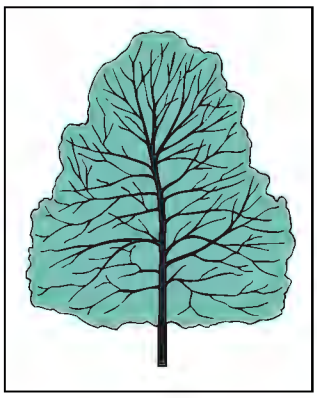
Height: 70-100 ft.
Spread: 25 ft.
Site preferences: Zone 5b-9a. Requires moist sites, will not tolerate dry sites. Salt sensitive.
pH: 5.0-7.5.
Ornamental characteristics: Shape: pyramidal. Lower branches need to be removed for streetside use. Fast growing.
Insect/disease factors: Relatively trouble free, though Japanese beetle can be a nuisance.
Additional: Transplant in spring or fall.

Tupelo *Nyssa sylvatica*



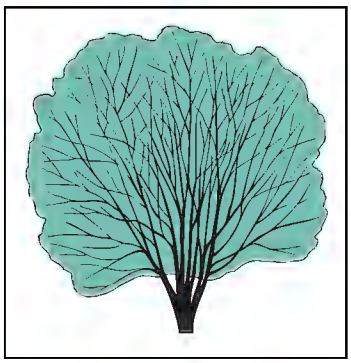
Height: 35 ft.
Spread: 20 ft.
Site preferences: Zone 5a-9a. Tolerates wet sites, intermittent drought. Relatively salt tolerant. pH: 5.5-7.0.
Ornamental characteristics: Shape: pyramidal. Bright red fall color.
Insect/disease factors: None.
Additional: Difficult to transplant — use small sizes, balled and burlapped only. Slow to recover from transplanting. Transplant in spring.

American hophornbeam *Ostrya virginiana*



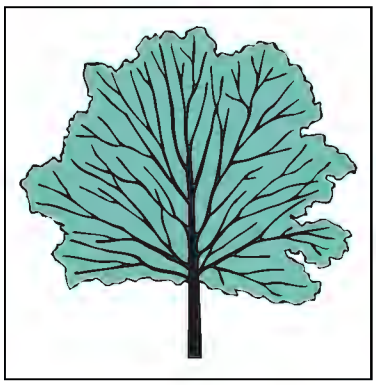
Height: 40 ft.
Spread: 25 ft.
Site preferences: Zone 3b-9a. Prefers moist soil but will tolerate moderately dry soils once established. Very salt sensitive. pH: 5.0-8.2. Tolerates light shade.
Ornamental characteristics: Shape: upright oval. Foliage is dark green; fall color is yellow. Slow growing.
Insect/disease factors: None.
Additional: Slow to recover from transplanting. Transplant in spring.

Amur corktree *Phellodendron amurense*



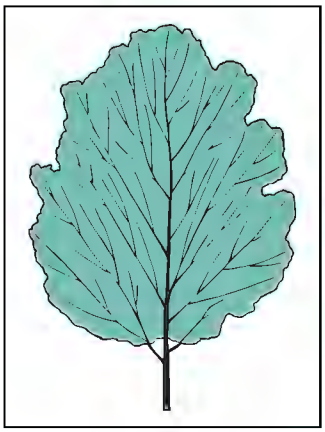
Height: 30-45 ft.
Spread: 40-50 ft.
Site preferences: Zone 3b-7. Drought and pollution tolerant. pH: adaptable.
Ornamental characteristics: Shape: broad, rounded. Yellow to bronze-yellow fall color. Ridged, corky bark in old age.
Insect/disease factors: None serious.
Cultivars: 'Eye Stopper'
'His Majesty'
'Macho'

London planetree *Platanus x acerifolia*



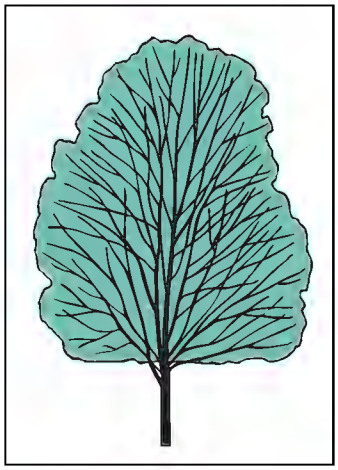
Height: 50 ft.
Spread: 40 ft.
Site preferences: Zone 5b-9a. Tolerates wet and intermittently flooded sites; drought tolerant. Salt tolerant. pH: 5.0-8.2.
Ornamental characteristics: Shape: pyramidal when young, becoming open, spreading with age. Medium green foliage, exfoliating bark.
Insect/disease factors: Overplanting has encouraged disease and insect problems in New York City. 'Liberty' resistant to anthracnose and powdery mildew; 'Bloodgood' moderately resistant. Cankerstain may be a problem.
Cultivars: 'Bloodgood' (maple-green foliage; tolerates severe pruning; rapid grower); 'Liberty'.
Additional: Transplant in spring or fall.

Common chokecherry *Prunus virginiana*



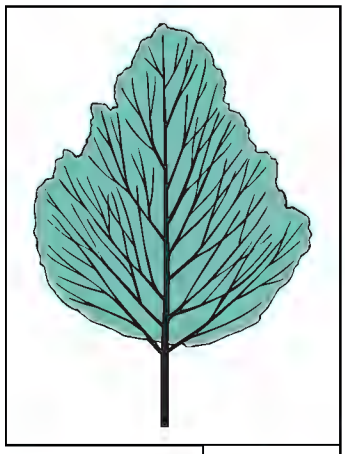
Height: 20-30 ft.
Spread: 18-25 ft.
Site preferences: Zone 2-6. Tolerant of moist and dry sites.
pH: adaptable.
Ornamental characteristics: Shape: rounded. White flowers in early May, red fruit that ripen to a dark purple.
Insect/disease factors: Black knot.
Cultivars: 'Schubert' and 'Canada Red' — foliage emerges green but changes to a reddish purple for the remainder of the growing season; pyramidal habit.

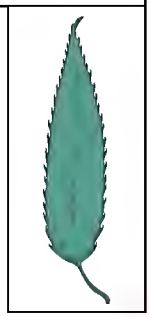
Callery pear *Pyrus calleryana*



Height: 50 ft.
Spread: 30 ft.
Site preferences: Zone 5-8. Tolerant of moist and dry sites. pH: adaptable.
Ornamental characteristics: Shape: formal rounded pyramidal. Foliage is glossy dark green; good red to purplish fall color. White flowers in late April or early May.
Insect/disease factors: Fire blight.
Cultivars: 'Aristocrat' — wider shape, yellow to red fall color; 'Red spire' — pyramidal habit, yellow fall color; 'Chanticleer' — oval to narrow oval.

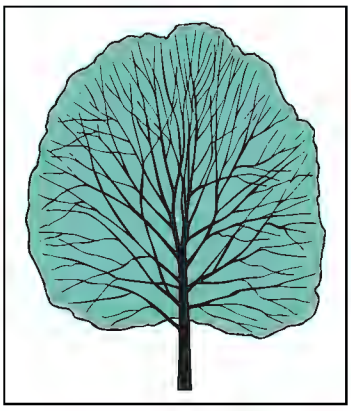
Sawtooth oak *Quercus acutissima*





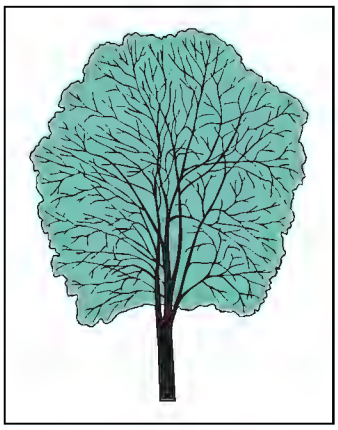
Height: 40 ft.
Spread: 40 ft.
Site preferences: Zone 5b or 6a-9a. Tolerates moderately dry soils. Moderate salt tolerance. pH: 5.0-7.5. Good growth rate in moist sites.
Ornamental characteristics: Shape: rounded. Foliage is dark green, glossy. Fall color is yellow.
Insect/disease factors: Reasonably pest free; preferred by orange-striped oakworm.

Swamp white oak *Quercus bicolor*



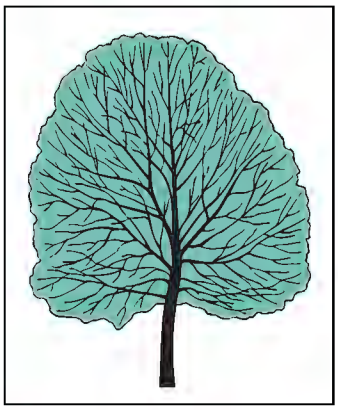
Height: 45 ft.
Spread: 45 ft.
Site preferences: Zone 4a-8b. Tolerates temporary flooding, wet soils and somewhat dry soils. Salt sensitive. pH: 5.0-7.0.
Ornamental characteristics: Shape: broad oval with round top. Foliage is green with wavy margins.
Insect/disease factors: None serious. Variable susceptibility to iron chlorosis.

Northern pin oak *Quercus ellipsoidalis*



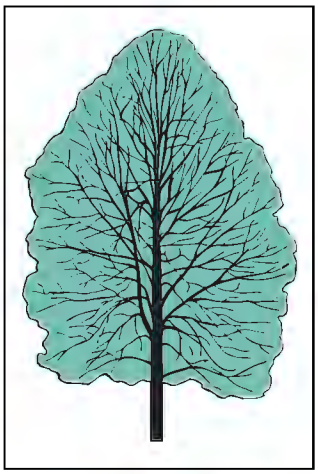
Height: 50-60 ft.
Spread: 50 ft.
Site preferences: Zone 4-6. Prefers moist, well-drained soil but tolerates wet and dry conditions. pH: neutral to slightly acidic.
Ornamental characteristics: Shape: pyramidal. Can have nice fall color.
Insect/disease factors: Stem and leaf galls.
Additional: Does not have the chlorosis problems that occur in pin oak.

Shingle oak *Quercus imbricaria*



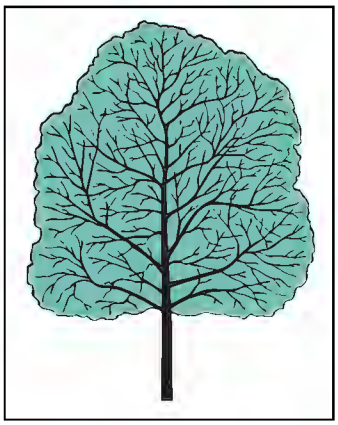
Height: 50 ft.
Spread: 40 ft.
Site preferences: Zone 5a-9a. Prefers moist soil but will tolerate intermittent drought. pH: 5.0-7.5.
Ornamental characteristics: Shape: broadly oval. Foliage is dark green, glossy. Fall color is yellowish to rusty red.
Insect/disease factors: Anthracnose, canker, powdery mildew, rust, wilt, galls, scales, borers, miners, etc., may be a problem.
Additional: Slow to recover from transplanting. Transplants well in spring.

Bur oak *Quercus macrocarpa*



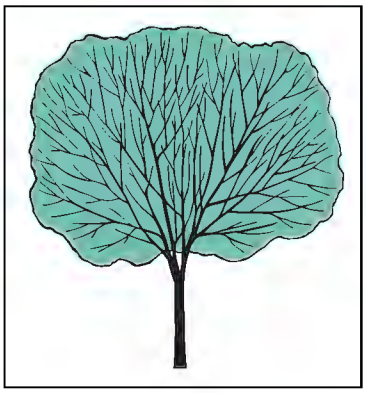
Height: 55 ft.
Spread: 45 ft.
Site preferences: Zone 3a-9a. Tolerates drought and intermittent flooding. pH: 5.0-8.2.
Ornamental characteristics: Shape: broadly oval, irregular and open. Foliage is dark green. Fall color is yellow to yellow-brown. Corky bark.
Insect/disease factors: Susceptible to anthracnose, intermediate preference by orange-striped oakworm but generally not seriously affected.
Additional: Slow growing, massive tree needs adequate space. Transplant small sizes in spring.

Chinkapin oak *Quercus muehlenbergii*



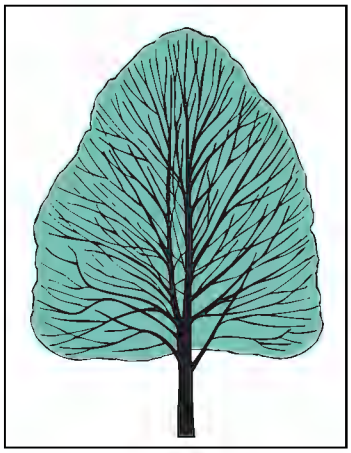
Height: 45 ft.
Spread: 45 ft.
Site preferences: Zone 5a-8b. Tolerates moderate drought. pH: 5.0-8.2. Extremely tolerant of alkaline soil.
Ornamental characteristics: Shape: rounded, open. Foliage is lustrous dark green. Fall color is yellow to yellow-brown.
Insect/disease factors: None serious.
Additional: Transplant in spring.

Japanese pagodatree *Sophora japonica*



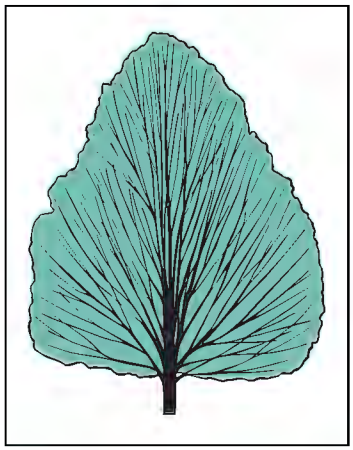
Height: 50-70 ft.
Spread: 40-70 ft.
Site preferences: Zone 5b-9a. Tolerates drought. Salt tolerant. pH: 5.0-8.2.
Ornamental characteristics: Shape: dense, round. Attractive cream-colored flowers in late July.
Insect/disease factors: 'Regent' resistant to leafhoppers, twig dieback and stem canker in colder zones.
Cultivars: 'Princeton Upright' (upright); 'Regent' (rapid growth, profuse flowering, resistant to leaf chewers).
Additional: Fixes own nitrogen. Transplant in spring or fall. Somewhat weak wooded.

Linden or Basswood *Tilia americana*



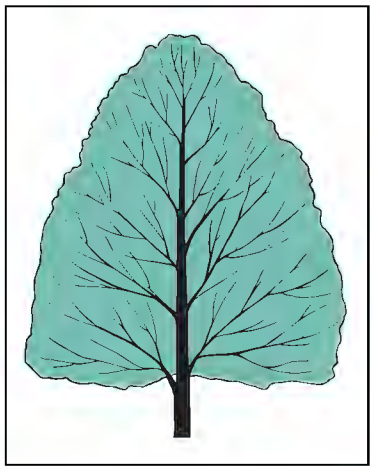
Height: 35-50 ft.
Spread: 25-30 ft.
Site preferences: Zone 3a-8a. Requires moist, well-drained sites but will tolerate intermittent drought once established. Salt sensitive. pH: 6.5-8.2.
Ornamental characteristics: Shape: narrow to broad pyramidal, depending on cultivar. Foliage is light green to dark green, depending on cultivar. Fragrant flowers in June.
Insect/disease factors: Very susceptible to Japanese beetles; mites, aphids, borers, leaf miners and scale may also be problematic.
Cultivars: 'Boulevard' (narrowly pyramidal, hardy to zone 3); Legend® (broadly pyramidal, zone 4, medium green); 'Redmond' (pyramidal, light green foliage).
Additional: Transplant in spring or fall.

Little-leaf linden *Tilia cordata*



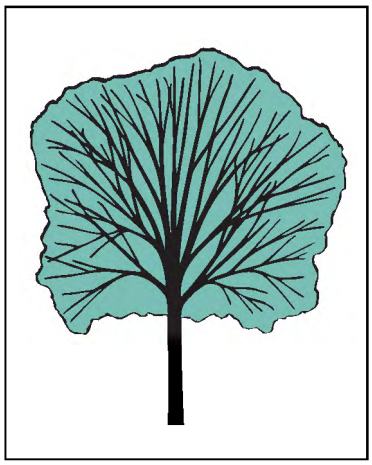
Height: 60-70 ft.
Spread: 40-50 ft.
Site preferences: Zone 3b-7. Prefers moist, well-drained soil. pH: adaptable. Pollution tolerant.
Ornamental characteristics: Shape: rounded and densely branched. Yellowish, fragrant flowers that emerge in late June.
Insects/disease factors: Japanese beetle, aphids, scab and linden mite.
Cultivars: 'Greenspire' — single leader and nice branching form; 'June Bride' — more formal habit and greater flowering; 'Harvest Gold' — very hardy, bright yellow fall color.

Silver linden *Tilia tomentosa*



Height: 50-70 ft.
Spread: 30-50 ft.
Site preferences: Zone 3b-7. Prefers moist, well-drained soils but is somewhat drought and heat tolerant. pH: adaptable.
Ornamental characteristics: Shape: upright oval. Glassy dark green leaves that are silvery underneath. Yellowish white, fragrant flowers in early July.
Insect/disease factors: Same as little-leaf linden but less susceptible.
Cultivars: 'Green Mountain' — fast growing, better drought and heat tolerance; 'Sterling' — broad pyramidal habit, resistant to Japanese beetle.

Elm hybrids *Ulmus* spp.

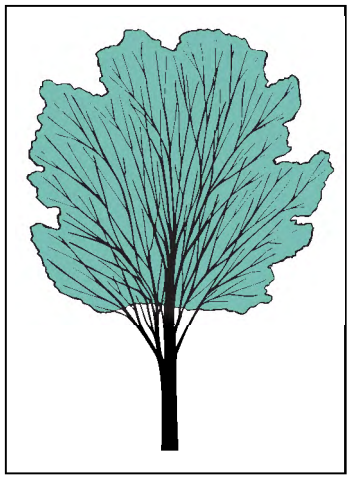


Height: 40-50 ft.
Spread: 30-50 ft.
Site preferences: Zone varies. Tolerates intermittent flooding and drought once established. pH: 5.0-8.2.
Ornamental characteristics: Shape: upright vase.
Cultivars: Cultivars reportedly resistant to Dutch elm disease:

Hybrids: 'Accolade'
'Commendation'
'Frontier'
'Homestead'
'New Horizon'
'Triumph'

American: 'Valley Forge'
'Princeton'
'Jefferson'

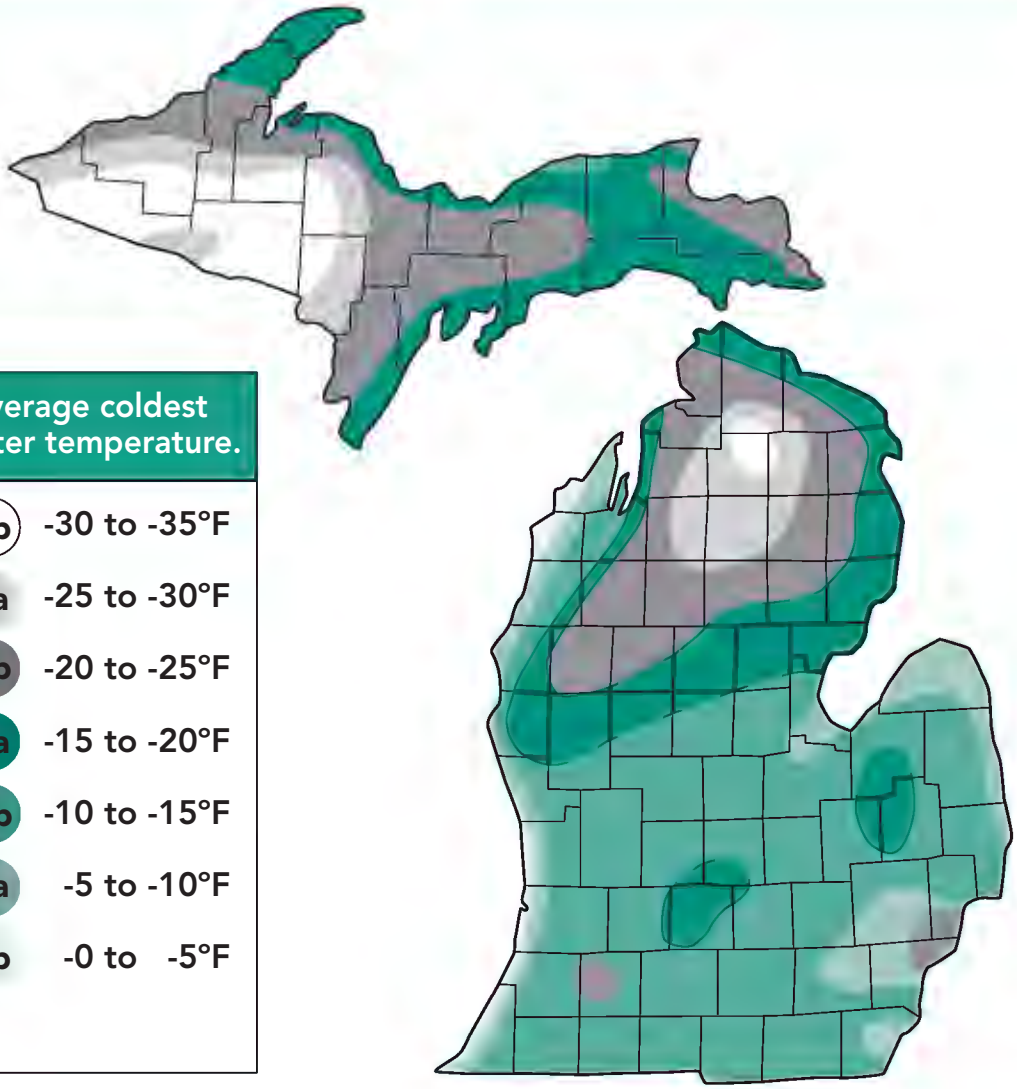
Japanese zelkova *Zelkova serrata*



Height: 50-80 ft.
Spread: 40-50 ft.
Site preferences: Zone 5. Prefers moist, well-drained soil but is drought tolerant. pH: adaptable.
Ornamental characteristics: Shape: vase-shaped. Foliage has rusty orange fall color. Flaky, attractive bark.
Insect/disease factors: None serious.
Cultivars: 'Green Vase' — fast growing, nice branching habit, good fall color.

Thanks also to Keith Warren of J. Frank Schmidt & Son Company for his expertise in developing this publication.

ZONE MAP



	Average coldest winter temperature.
3b	-30 to -35°F
4a	-25 to -30°F
4b	-20 to -25°F
5a	-15 to -20°F
5b	-10 to -15°F
6a	-5 to -10°F
6b	-0 to -5°F

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