Recommended Alternatives to Ash Trees for Michigan's Lower Peninsula

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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.
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### 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.

### 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.

### 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.

### 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 hippocastanea*

- **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. “Muscle” 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.

Horse chestnut  *Aesculus hippocastanea*

- **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. “Muscle” 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.
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**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.
- **Cultivars:** ‘Prairie Titan’ — nice branching habit and blue-green summer foliage. ‘Espresso’ — seedless, good form.
- **Insect/disease factors:** None serious.

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.
- **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.

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**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.

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**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.

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**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 hop hornbeam** *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.

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**Amur corktree** *Phellodendron amurense*

Height: 30-45 ft.
Spread: 40-50 ft.


*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’

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**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.

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**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.

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.

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.

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.
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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-9a. Prefers moist soil but will tolerate intermittent 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.

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**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.
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ZONE MAP

Average coldest winter temperature.

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<thead>
<tr>
<th>Zone</th>
<th>Temperature</th>
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<tbody>
<tr>
<td>3b</td>
<td>-30 to -35°F</td>
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<tr>
<td>4a</td>
<td>-25 to -30°F</td>
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<td>6b</td>
<td>-0 to -5°F</td>
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