



Trees to Avoid Planting in the Midwest and Some Excellent Alternatives – Part 1

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Trees provide us with many environmental, aesthetic, functional, and economic benefits. Tree selection is one of the most important considerations when a homeowner, nurseryman, or landscaper is deciding what species to grow or plant. Many questions need to be answered including size, location, site characteristics, aesthetic features, pest susceptibility, hardiness, and maintenance considerations. Some trees can become a maintenance headache due to their inherent pest problems or lack of structural integrity.

The trees represented in this story have not generally performed well in urban and suburban areas of the Midwest. Some are susceptible to insects and diseases, and some have severe structural problems such as being weak-wooded or prone to girdling roots or included bark formation. Others have cultural problems such as

Wisconsin DNR guidelines for tree planting within a city:

Plant no more than 20% of a family: i.e., *Betulaceae*, *Aceraceae*, *Oleaceae*, etc.

Plant no more than 10% of a genus within a family: i.e., within the birch family: *Betula lenta*, *Ostrya virginiana*, *Carpinus caroliniana*, *Corylus colurna*, *Alnus*, etc.

Plant no more than 5% of a species within a genus: i.e., *Betula lenta*, *Betula nigra*, *Betula papyrifera*, or *Betula populifolia*

intolerance to high pH, road salt, drought, and poor drainage. A few tree species are invasive and should be avoided near sensitive areas or where seed dispersal into woodlands could occur.

Some of these trees may do quite well in other parts of the U.S., so my intention is

not to apply a blanket statement for all these trees to all situations. Invasiveness and pest susceptibility can vary geographically. The article is based on more than 25 years of field experience and data collected from numerous states' plant disease and insect diagnostic clinics, and conversations with arborists, nursery growers, landscapers, and Extension personnel. There are alternative species that can be used and are mentioned in Part 2. These alternative tree species have performed well in USDA Cold Hardiness Zone 4b.

U.S.D.A. Cold Hardiness Zones

Zone 3a (cold hardy to –35 to –40°F)
 Zone 3b (cold hardy to –30 to –35°F)
 Zone 4a (cold hardy to –25 to –30°F)
 Zone 4b (cold hardy to –20 to –25°F)
 Zone 5a (cold hardy to –15 to –20°F)
 Zone 5b (cold hardy to –10 to –15°F)

Trees to Avoid for the Midwest Urban Landscape

1) *Acer platanoides* (Norway maple)

Abiotic or structural problems: poor structure, tight branching, often forms double leaders due to its opposite branching, girdling roots, shallow root system, leaf scorch, frost crack and sunscald on young trees, intolerant to poor drainage

Insects and mites: Japanese beetles, cottony maple scale

Diseases: Verticillium wilt, basal/crown rot near the soil line and decline due to deep planting, Eutypella and Nectria cankers, internal decay when older, root rot

Invasiveness: very invasive, especially in woods and natural areas due to production of lots of fruit/seed that creates a litter mess

2) *Fraxinus* spp. (ashes)

Abiotic or structural problems: girdling roots, subject to storm damage, poor form (green ash), often forms double leaders due to its opposite branching, greater maintenance pruning required, leaf drop in late spring, especially on green ash, bark splitting, white ash intolerant to poor drainage

Insects and mites: emerald ash borer (major pest), native ash borers, oystershell scale, ash plant bug, ash flower gall mite, sawflies

Diseases: anthracnose, Verticillium wilt, ash yellows, basal rot (white ash) due to deep planting, leaf spot, cankers

Fruit: female trees produce large amounts of unsightly fruit in large clusters that create a litter mess, can reseed

3) *Tilia cordata*, especially 'Greenspire'

(Greenspire littleleaf linden)

Abiotic or structural problems: tight branching, often develops multiple leaders, narrow branch

crotch angles leading to included bark formation, requiring lots of training pruning, basal suckering, girdling roots, decline due to deep planting, subject to storm damage, sunscald on trunk, sensitive to road salt and juglone, leaf scorch, intolerant to poor drainage

Insects and mites: Japanese beetles, linden borer, gypsy moth, some leaf galls, spider mites, scale

Diseases: basal/crown rot due to deep planting, root rot, Nectria canker, Verticillium wilt, anthracnose

4) *Malus* spp. disease susceptible cultivars

(flowering crabapple)

Abiotic or structural problems: basal suckering from rootstock, watersprouts on branches, poor form and tight branching (some cultivars), sensitive to juglone, intolerant to poor drainage

Insects and mites: Japanese beetles, spider mites, eastern tent caterpillar, gypsy moth, aphids, leaf rollers, borers, fall webworm, cankerworms, scale

Diseases: susceptibility to diseases varies across the country, apple scab, frog-eye leaf spot, fireblight, cedar-apple rust, powdery mildew, cankers, root rot

Fruit: some cultivars produce either large or non-persistent fruit that falls and creates a litter mess; some cultivars are alternate bearing (fruit heavily every other year)

Animals: subject to rabbit and vole injury at base of trunk, deer browse the fruit

Crabs to avoid in Midwest due to scab, frog-eye leaf spot and/or fireblight susceptibility, or forms watersprouts, alternate flower bearing, or produces large, messy fruit:

'Adams,' 'Amberina,' 'Amerspirzam' (American Spirit®), 'Amertrizam' (American Triumph™),

'Amsalzam' (American Salute™), 'Beverly,' 'Birdland,' 'Bob White,' 'Branzam' (Brandywine®), 'Centennial,' 'Centzam' (Centurion®), 'Cinzam' (Cinderella®), 'David,' 'Donald Wyman,' 'Doubloons,' 'Hargozam' (Harvest Gold®), 'Hopa,' 'Huber' (Royal Fountain®), 'Indian Magic,' 'Indian Summer,' 'Jewelberry,' 'Katherine,' 'Kelsey,' 'Leprechaun,' 'Liset,' 'Manzam' (Madonna®), 'Mary Potter,' 'Pink Dawn,' 'Pink Satin,' 'Pink Spires,' 'Professor Sprenger,' 'Profusion,' 'Radiant,' 'Ralph Shay,' 'Red Barron,' 'Red Jade,' 'Red Splendor,' 'Red Swan,' 'Robinson,' 'Royalty,' 'Selkirk,' 'Sentinel,' 'Silver Drift,' 'Snowcap,' 'Snowdrift,' 'Spring Snow,' 'Schmidcutleaf' (Golden Raindrops® due to fireblight), 'Strawberry Parfait®,' 'Thunderchild,' 'Van Eseltine,' 'Velvetcole' (Velvet Pillar™), 'Weepczam' (Weeping Candied Apple®), 'White Cascade®,' 'Winter Gold,' 'Zumi Wooster' also *Malus baccata* 'Gracilis' and 'Columnaris,' *M. floribunda*, *M. ioensis*, *M. ioensis* 'Klehm's Improved Bechtel' and 'Prairie Rose,' *M. tschonoskii*, *M. x zumi* 'Winter Gem'

Despite the problems listed above, there are some excellent, disease resistant crabapple cultivars

5) *Acer saccharinum* (silver maple)

Abiotic or structural problems: poor structural form, narrow branch crotch angles leading to included bark formation, weak-wooded, subject to storm damage, watersprouts on branches, shallow surface roots, girdling roots, aggressive root system can ruin foundations and sewer pipes, can get chlorotic at very high pH, sensitive to juglone, leaf scorch, frost crack and sunscald on young trees, thin bark easily damaged due to mechanical injury

- Insects and mites: Eriophyid gall mites (causes bladder, ermineum, and spindle galls), cottony maple scale, borers
- Diseases: anthracnose, bacterial wetwood, Verticillium wilt, internal trunk decay, cankers, tar spot, Venturia leaf blotch
- Fruit: female trees produce large amounts of unsightly fruit in large clusters that create a litter mess, reseeds
- 6) White barked birches:** *Betula papyrifera* (paper birch, canoe birch), especially the Renaissance Series 'Cenci' (Renaissance Compact®), 'Oenci' (Renaissance Oasis®), 'Renci' (Renaissance Reflection®), 'Uenci' (Renaissance Upright®) 'Varen' (Prairie Dream®), *Betula pendula* (European white birch), *Betula* 'Madison' (White Satin™), *Betula* 'Avalzam' (Avalanche®), *Betula platyphylla* (Asian white birch), *Betula platyphylla* var. *japonica* (Japanese white birch), *Betula* 'Crimson Frost,' *Betula* 'Penci-2' (Royal Frost®), *Betula utilis* var. *jacquemontii* (white-barked Himalayan birch), *Betula maximowicziana* (Monarch birch), *Betula populifolia* 'Whitespire' (Whitespire gray birch, 'Whitespire Series' is less susceptible to borers and is only asexually propagated via tissue culture)
- Abiotic or structural problems: intolerant to heavy clay soils or poor drainage, road salt and drought intolerant, sensitive to juglone, not heat tolerant, shallow roots, susceptible to storm injury
- Insects and mites: very susceptible to bronze birch borer, birch leaf miner, Japanese beetles, gypsy moth, sawflies
- Diseases: anthracnose, cankers, leaf spot
- 7) Poplars, willows, and their hybrids:** *Populus deltoides* (eastern cottonwood), *Populus alba* (white poplar, very invasive), *Salix x sepulcralis* var. *chrysocoma* (golden weeping willow) and *Salix matsudana* x *Salix alba* (Austree® willow)
- Abiotic or structural problems: weak-wooded, fast growing, very susceptible to storm damage due to brittle branches, roots very aggressive and can ruin foundations and clog sewer pipes, messy tree (consistent fruit, leaf and branch litter problems), a number of municipalities have ordinances against planting some of these trees
- Insects and mites: willow leaf beetle, borers, Japanese beetles (willows), elm sawfly (willows), aphids, fall webworm, gypsy moth, scale
- Diseases: leaf spot, leaf rust, many stem and trunk cankers, bacterial wetwood, leaf and shoot blight, anthracnose
- Fruit: female poplar and willow trees produce large amounts of cottony seeds that create a litter mess, can reseed; hybrids are mainly male so no seeds
- 8) Some cherries and plums:** *Prunus virginiana* 'Schubert' or 'Canada Red' (Canada Red chokecherry), *Prunus serotina* (black cherry) *Prunus* 'Newport' (Newport plum), *Prunus nigra* 'Princess Kay' (Princess Kay Canadian plum), *Prunus padus* (European bird cherry), *Prunus pensylvanica* (pin cherry, fire cherry), *Prunus americana* (American plum, wild plum), *Prunus cerasifera* (purpleleaf plum), *Prunus x cistena* 'Schmidtciis' (Big Cis®, tree form)
- Abiotic or structural problems: weak-wooded, susceptible to storm injury (black cherry), intolerant to heavy clay, poorly drained soils, short-lived trees, narrow branch crotch angles leading to included bark formation, girdling roots, leaves, twigs, and seeds are poisonous, especially to livestock
- Insects and mites: shothole borers, eastern tent caterpillar, Japanese beetles, scale, fall webworm, pear slug, gypsy moth, cankerworms, spider mites
- Diseases: very susceptible to black knot, bacterial canker, brown rot, internal decay, viruses, root/crown rot, cherry leaf spot, plum pox, root rot
- Fruit: messy fruit that stains sidewalks, reseeds readily (black cherry); "mummy" shriveled fruit on plums
- Animals: subject to rabbit and vole injury at base of trunk
- 9) Mountainashes:** *Sorbus aucuparia* (European mountainash), *Sorbus americana* (American mountainash), *Sorbus decora* (showy mountainash), *Sorbus alniifolia* (Korean mountainash)
- Abiotic or structural problems: narrow branch crotch angles leading to included bark formation, sunscald on trunk, intolerant to heavy clay, poorly drained soils, not heat tolerant, intolerant to wet soils, road salt, drought, and air pollution
- Insects and mites: mountainash sawfly, borers, leafhoppers, Japanese beetles, aphids, gypsy moth, spider mites, fall webworm, oystershell scale, gall mites
- Diseases: very susceptible to fireblight, stem cankers, apple scab on fruit and leaves, leaf rust, root rot
- Fruit: European mountainash fruit can shrivel on plant and be full of disease
- 10) Some hawthorns:** *Crataegus laevigata* 'Crimson Cloud' ('Superba'), 'Paul's Scarlet,' (Crimson Cloud and Paul's Scarlet English hawthorns), *Crataegus* 'Vaughn' (Vaughn hawthorn), *Crataegus x mordenensis* 'Snowbird' and 'Toba' (Snowbird and Toba Morden hawthorns), *Crataegus mollis* (downy hawthorn), *Crataegus ambigua* (Russian hawthorn), and *Crataegus punctata* 'Ohio Pioneer' (Ohio Pioneer thicket or dotted hawthorn)
- Abiotic or structural problems: intolerant to road salt and wet soils, very sharp thorns, narrow branch crotch angles leading to included bark formation, fruit on some hawthorns can create a litter mess, difficult to transplant
- Insects and mites: hawthorn leaf miner, woolly aphids, lacebugs, borers, gypsy moth, spider mites, scale, aphids
- Diseases: very susceptible to cedar-apple/hawthorn/quince rust on leaves, twigs and fruit (rust can defoliate the trees by midsummer), fireblight, powdery mildew, leaf spot, leaf blight, stem cankers
- 11) Tree species requiring acid soils, but placed into alkaline soils:** *Acer rubrum* (red maple), *Quercus palustris* (pin oak), *Quercus coccinea* (scarlet oak), *Quercus rubra* (northern red oak), *Quercus alba* (white oak), *Betula nigra* (river birch), *Fagus grandifolia* (American beech), *Amelanchier* spp. (serviceberries), *Larix* spp. (larches), all are great species, but ONLY if the soil pH is conducive to their growth (acid soils, below 7.0 pH).
- 12) Picea pungens** (Colorado blue spruce)
- Abiotic or structural problems: sensitive to juglone, intolerant to wet soils, intolerant to heat, pollution or high humidity, short-lived tree and often looks unsightly with age due to absence of lower branches
- Insects and mites: Cooley spruce gall adelgids, eastern spruce gall adelgids, spruce budworm, spider mites, borers, spruce bud scale
- Diseases: very susceptible to Cytospora canker, Rhizosphaera needle cast, root rot, Weir's cushion rust, spruce needle drop, often full of dead branches due to diseases
- 13) Pinus nigra** (Austrian pine)
- Abiotic or structural problems: sensitive to juglone, intolerant to wet soils, short-lived tree due to pests
- Insects and mites: European pine shoot moth, Zimmerman pine moth, European pine sawfly, bark beetles, borers, pine needle scale
- Diseases: very susceptible to Diplodia tip blight, pine wilt nematode, Dothistroma needle blight, Lophodermium needle cast, root rot
- 14) Pinus sylvestris** (Scots pine, Scotch pine)
- Abiotic or structural problems: sensitive to juglone, intolerant to wet soils, short-lived tree due to pests, prone to limb breakage due to snow and ice loads
- Insects and mites: European pine shoot moth, Zimmerman pine moth, European pine sawfly, bark beetles, borers, pine needle scale
- Diseases: very susceptible to Diplodia tip blight, pine wilt nematode, Dothistroma needle blight, Lophodermium needle cast, brown spot, root rot
- Invasiveness: invasive, especially in woods and natural areas, but is easily controlled as stumps do not resprout and no root suckers
- 15) Juniperus scopulorum** (Rocky Mountain juniper)
- Abiotic or structural problems: gets leggy and ratty if in shade, not heat tolerant, intolerant to high humidity or poorly drained soils, short-lived tree/shrub due to pests, prone to limb breakage due to snow and ice loads
- Insects and mites: bagworms, spider mites, scale
- Diseases: very susceptible to Phomopsis tip blight and other cankers leading to extensive death of branches, cedar-apple/hawthorn/quince rust, root rot, cankers
- 16) Invasive tree species:**
- Acer campestre* (hedge maple): has become invasive out east and in the south, marginally hardy here, susceptible to Verticillium wilt, can reseed, can get aphids, scale, borers, canker and dieback due to lack of cold hardiness in zone 5
- Acer negundo* (boxelder): native, but reseeds and root sprouts quite readily, weak-wooded, prone to storm injury, breeds populations of boxelder bugs that enter homes in late fall, trunk decay, Verticillium wilt
- Acer platanoides* (Norway maple): see above
- Acer tataricum* subsp. *ginnala* (Amur maple): reseeds readily, very susceptible to Verticillium wilt, stem cankers
- Ailanthus altissima* (tree-of-heaven): reseeds and root sprouts, weak-wooded, narrow branch crotches and included bark, prone to storm injury, suckers readily, fruit makes a mess, Verticillium wilt, on NR-40 Restricted plant list (can not transport, transfer, or introduce this species as it is already established in Wisconsin and is very invasive; you can possess this plant)
- Alnus glutinosa* (European black alder): sensitive to juglone, intolerant to drought, susceptible to woolly alder aphids, sooty mold on leaves, leaf miners, borers, powdery mildew, Japanese beetle
- Elaeagnus angustifolia* (Russian-olive): reseeds and root sprouts, very susceptible to Phomopsis canker, Verticillium wilt, scale, retains old, dead branches, produces lots of watersprouts, short-lived, has thorns, on NR-40 Restricted plant list (can not transport, transfer, or introduce this species as it is already established in Wisconsin and is very

invasive; you can possess this plant)

Kalopanax septemlobus (formerly *K. pictus*)
(Castor-aralia): sharp prickles on stems and bark, reseeds readily, very invasive

Morus alba (white mulberry): reseeds and root sprouts very easily, weak-wooded, produces lots of root suckers, susceptible to storm injury, aggressive root system, fruit litter stains sidewalks, leaf spot, stem cankers, powdery mildew, bacterial blight, scale, spider mites

Paulownia tomentosa (royal empress tree, princess tree): reseeds and root sprouts, fruit litter, weak-wooded, subject to storm injury, root suckers, borers, not reliably hardy in zone 4 and will winter kill back to ground, on NR-40 Prohibited plant list (can not transport, possess, transfer, or introduce this species to Wisconsin)

Phellodendron amurense (females ONLY are invasive) (Amur corktree): females produce lots of black fruit in large clusters that stain sidewalks and reseed readily; plant male cultivars only as they are not invasive

Populus alba (white poplar): reseeds and root sprouts very easily, fruit litter, root suckers and forms colonies, roots very aggressive and can ruin foundations and sewer pipes, weak-wooded, prone to storm injury, very susceptible to stem cankers, aphids, borers, messy tree dropping seeds, twigs, leaves and branches

Robinia pseudoacacia (black locust): weak-wooded, susceptible to storm injury, root suckers and reseeds profusely, susceptible to black locust borer, stem cankers, powdery mildew

Ulmus pumila (Siberian elm): reseeds, very weak-wooded, poor form, drops twigs and branches often, susceptible to elm leaf miner, elm leaf beetle, elm flea weevil, Japanese beetles, cankerworms, gypsy moth, bacterial wetwood, Verticillium wilt