

### **Replanting as emerald ash borer kills millions of ash trees**

We were instrumental in identifying and tracking the initial infestation of emerald ash borer in North America in 2002 and 2003 and have been working since then with individuals and groups as neighborhoods change from shady to sunny virtually overnight. We'd like to help you by sharing what we've learned.

**Replacement tree species.** Some commonly-available trees such as red maple, little-leaf linden, callery pear and honey locust can be planted in place of lost ash trees. However, these trees already occur in great numbers in many Midwest landscapes. If all of the millions of ash trees lost to emerald ash borer are replaced by just these few species, we will once again be in the position of risking huge numbers of trees to introduced foreign pests that focus on single species such as chestnut blight, elm disease and emerald ash borer.

There are many fine tree species which have not been heavily planted in the Midwest, not because they are not easy to grow, not because they lack beauty in form, fall color, flower or all three, but because the economies of mass production have focused the landscape industry on a limited number of species. Diversity in replanting offers beautiful variety plus some insurance that whole neighborhoods will not in the future be stripped of all trees by epidemic or insect outbreak.

Here are less-common species that can be planted to replace ashes:

#### In restricted-root spaces, less than five feet wide:

- Crabapples with known disease resistance such as 'Prairifire', 'Red Baron', 'Red Jewel', and 'Sugar Tyme'
- Hawthorns, thornless such as Washington hawthorn (*Crataegus phaenopyrum*) 'Princeton Sentry' and Crusader (*C. crusgalli inermis*)
- Japanese tree lilac (*Syringa reticulata*)
- Redbud (*Cercis canadensis*)
- Serviceberry (*Amelanchier canadensis*)
- Chinese fringe tree (*Chionanthus retusus*)
- Kousa dogwood (*Cornus kousa*)

#### For root spaces between five to ten feet wide:

- American and European hornbeam (*Carpinus betulus* and *C. caroliniana*)
- Hophornbeam or ironwood (*Ostrya virginiana*)
- Katsura (*Cercidiphyllum japonicum*)
- Mountain silverbell (*Halesia monticola*)
- Golden rain tree (*Koelreuteria paniculata*)
- Amur cork tree (*Phellodendron amurense*, fruitless varieties such as 'Shademaster' and 'His Majesty')

#### Trees for larger boulevards and islands, root space at least ten feet wide:

- Turkish filbert (*Corylus colurna*)
- Hackberry (*Celtis occidentalis*)
- Hardy rubber tree (*Eucommia ulmoides*)
- Yellowwood (*Cladrastis kentukea*)
- Ginkgo (*Ginkgo biloba*, fruitless types 'Autumn Gold' or 'Santa Cruz')

#### For areas without restriction on roots:

- Kentucky coffeetree (*Gymnocladus dioica*)
- Dawn redwood (*Metasequoia glyptostroboides*)
- Bald cypress (*Taxodium distichum*)
- Black gum (*Nyssa sylvatica*)
- Bur oak (*Quercus macrocarpa*)
- Shingle oak (*Quercus imbricaria*)
- Swamp white oak (*Quercus bicolor*)
- Sawtooth oak (*Quercus acutissima*)
- Lacebark elm (*Ulmus parvifolia*)
- American linden (*Tilia americana*)

**Trees for spaces where roots can spread just five feet wide.**

Can tolerate restricted root space: small islands and narrow strip between sidewalk and street. May need pruning to remove lower branches as they grow, as clearance for traffic.

**Chinese fringetree** (*Chionanthus retusus*) 15 - 25' tall, may be taller. Slow to grow, less than 12" per year. Often shrubby in habit, to attain tree form must have lower limbs removed as it grows. Hardy within the Detroit Metro area but may not be hardy in the colder parts of zone 5 in suburbs. Bright white confetti flowers in June. Blue-black fruit in fall is relished by birds but borne only on female trees, if a male fringetree is nearby. Fall color may be yellow. Full sun or part shade. Prefers deep, moist soil but tolerates a wide range of soil conditions.

**Crabapples** (*Malus* varieties with known disease resistance such as 'Adams', 'Prairifire', 'Red Jewel', and 'Sugar Tyme') 15' ('Red Jewel'), 18' ('Sugar Tyme'), 20' ('Prairifire'), 24' (Adams'), rounded or slightly narrower than tall. Grows about 12" per year. Flowers white ('Red Jewel'), pale pink ('Adams', 'Sugar Tyme') or dark red-purple ('Prairifire'). Fruit small, red; persists into or through winter. Birds eat the fruit by spring. Full sun, well drained soil.

**Hawthorns** (thornless types such as *Crataegus phaenopyrum* 'Princeton Sentry', Washington h., and *C. crusgalli inermis*, Crusader h.) 20 to 25' tall and wide. 12-15" growth per year. White flowers (with unpleasant odor - Crusader) come later than crabapples but help these trees masquerade as crabs. Fall color orange to red or purple. Crusader keeps its small reddish fruit into early winter, Princeton Sentry until spring; birds are attracted to both. Full sun and any type of soil so long as it is well drained.

**Japanese tree lilac** (*Syringa reticulata*) 20 to 30' tall and not quite as wide. Grows 12 to 18" per year. Creamy white fragrant flowers open in June, weeks after common lilac. No significant fall color but bright red brown bark nice in winter. Full sun. Well drained soil.

**Kousa dogwood** (*Cornus kousa*) About 20' tall and wide, can be larger. Grows about 12" per year. Often sold as a multi-stemmed or very low branched specimen but single trunk kousa dogwoods make excellent small shade trees if lower limbs are discouraged or removed. White flowers in June that persist into July. Varieties with pink flowers, larger or later blooms are available. Large rosy fruits favored by birds in late summer. Bark develops polished tricolor effect as the tree ages, very attractive in winter. Fall color may be good maroon. Part shade is best but will tolerate full sun. Moist well drained soil.

**Redbud** (*Cercis canadensis*) 20 to 30' tall and wide. Very fast growth when young, slowing to 12 to 18" per year. Flowers are tiny but numerous, red-violet nubs all along the branches in May. Fall color can be a clear yellow. Bark is near-black with crevices revealing of orange beneath. Some people object to the shaggy winter look in a year when many seed pods form. Half sun or full sun in moist, well drained soil; tolerant of shade.

**Serviceberry** (*Amelanchier* species) 25' tall, may be taller; 15-20' wide. Grows 1-2' per year. Fragrant white flowers in early May. Edible, sweet, blueberry sized fruit in midsummer loved by birds. Fall color variable each year, yellow to deep red-orange. Smooth gray bark. Best in sun or half-sun in moist well-drained soil.

**Trees for spaces between five and ten feet wide:**

**Amur cork tree** (*Phellodendron amurense*, fruitless varieties such as 'Shademaster' and 'His Majesty') 30 to 45' tall, often broader than tall. Grows 12 to 18" per year. No showy bloom. Brief yellow fall color. Very open crown provides light shade and beauty of line in winter. Handsome corky bark develops in its old age. Full sun. Most soils are okay.

**Golden rain tree** (*Koelreuteria paniculata*) 30 to 40' tall and wide. Grows 1 to 2' per year to form a round crown of widely spaced branches for light shade. Flowers are large yellow conical clusters in late June, but bloom time varies between plants; some don't flower until August. Seed pods are showy, like yellow-green Chinese lanterns draping the tree. No fall color. Full sun to part sun. Well drained soil. Tolerates high alkaline soils, drought and heat.

**Hophornbeam or ironwood** (*Ostrya virginiana*) 25 to 40' tall and wide. Grows 8 to 12" per year. No significant flower or fall color, just a dependable small shade tree. Full sun to half shade. Well drained soil.

**Hornbeam** (*Carpinus betulus*, European; *C. caroliniana*, American) 40-60' tall, 30-40' wide. 8 to 12" growth per year. American hornbeam or musclewood smaller by half and slower to grow than European. Inconspicuous flower. Fall color late, yellow, variable by year. Smooth steel gray bark fluted like a well muscled limb. Best in full sun & well-drained soil.

**Katsura** (*Cercidiphyllum japonicum*) 40' tall, may be taller; variable in width. Blue-green foliage is purple while leafing out, yellow in fall. Grows 1-2' per year. No significant flower or fruit. Best in rich, moist well drained soil in full sun.

**Mountain silverbell** (*Halesia monticola*) 60' tall by about 40' wide, upright or conical in form. Grows 12-18" per year. White or pale pink bell flowers hang from the branches in May. Fall color is not usually notable. Part sun is best. Moist, well drained soil. Tends to be low branched so may need pruning of lower limbs while young to obtain clearance for traffic in its shade.

### **Trees for spaces at least ten feet wide**

For larger boulevards and islands, where root zone is at least 10'.

**Ginkgo** (*Ginkgo biloba*, fruitless male varieties such as 'Autumn Gold' and 'Santa Cruz') 50 to 80' tall with a variable spread ('Santa Cruz' is very wide, 'Autumn Gold' just a bit more than half as wide as tall). Grows 12" or more per year in its youth, slower as it matures. Flowers are inconspicuous. Fall color can be a superb gold. Female trees are not desirable as the fallen fruit is malodorous. Full sun. Prefers deep, moist sandy soil but tolerates almost any situation.

**Hackberry** (*Celtis occidentalis*) 40 to 60' tall and wide, may be larger. Grows 1 to 2' per year. Grows in almost any soil and moisture condition, in full sun. Makes no show of flower or fall color. Hard seeded berry-like fruit loved by birds and small mammals. This is another of many native trees that are just being discovered for use in the landscape. Like the ash, it's a tree that rarely stars, always fills a supporting role. Some selections have been made, such as 'Prairie Pride' with especially lustrous leaves and a broad crown or 'Windy City' for a fast growth rate and especially wide spread reminiscent of its relative, the American elm.

**Hardy rubber tree** (*Eucommia ulmoides*) 40 to 60' tall and wide. Grows 12 to 18" per year. Lustrous dark green, pest-free foliage. Inconspicuous bloom. No fall color. Full sun and almost any type and condition of soil. This tree fits the bill for people who want a non-fussy, relatively fast growing, pest free shade tree that does not drop fruit or seeds

**Turkish filbert** (*Corylus colurna*) 40 to 50' tall and about half as wide. Grows 12-18" per year. Insignificant flowers, little fall color. Nuts ripen in fall. Dark green foliage is pest free. In full sun and well drained soil can tolerate almost any other adverse condition, including the droughty soils that cause scorch on maples.

**Yellowwood** (*Cladrastis kentuckea*) 30 to 50' tall. Wider than tall. Grows about 12" per year. Fragrant white flowers in large pendant clusters in June. Smooth gray bark. Full sun and well drained soil.

### **Trees that should not have any restriction to their roots**

These are trees that belong in back yards, parks and wide open spaces.

**American linden** (*Tilia americana*) 60 to 80' tall and 2/3 as wide. Grows 12 to 18" per year. Small white flowers in June are fragrant even at a distance and very attractive to bees -- thus called "bee tree." Fall color sometimes yellow. Full sun to half sun. Almost any soil.

**Bald cypress** (*Taxodium distichum*) 50 to 70' tall and half as wide. Pyramidal. Grows 1 to 2' per year. Fern-like foliage emerges yellow green and fades to yellow or orange-brown in fall. Attractive shaggy red-brown bark and buttressed trunk. Full sun. Moist to wet soil.

**Black gum** (*Nyssa sylvatica*) 30 to 50' tall and 2/3 as wide. Grows 12" per year. Its bloom is inconspicuous but fall color is stupendous, from yellow orange to deepest scarlet. Small fruits ripen in early fall and are eaten by birds. Full sun or part shade. Deep, moist well drained soil. Don't site it in harsh winds.

**Bur oak** (*Quercus macrocarpa*) 70 to 80' tall and wide. Can be larger. 8 to 12" growth per year. Nothing to note in terms of flower or fall color. Full sun. Most any soil. More tolerant of city conditions than almost any other oak.

**Dawn redwood** (*Metasequoia glyptostroboides*) 70 to 100' tall, 25' wide. The tree is an impressive pyramidal form. Grows 3' a year. Inconspicuous flower. Foliage is ferny, very attractive and sometimes red-orange in fall. Bark is shaggy red-brown, easy to like. Full sun. Prefers moist, well drained soil but is very tolerant of wet soil. Pest problems are very rare.

**Kentucky coffeetree** (*Gymnocladus dioica*) 60-75' tall, not as wide as tall. Can be larger. Grows about 12" per year. Flower is insignificant. Female trees can bear large, hard pods; if this is unacceptable hold out for the male variety 'Prairie Titan' or 'Stately Manor.' Fall color may be a good yellow. It can aggravate fastidious rakers since in fall the leaves, the ribs that connect the leaflets, and the seed pods drop at different times. Full sun. Deep, moist soils are best but the tree will tolerate almost any city condition.

**Lacebark elm** (*Ulmus parvifolia*) 40 to 50' tall and wide. Grows 1 to 2' per year. Inconspicuous flower. Fall color may be yellow or red-purple. Mottled, peeling bark is a plus in winter. Full sun. Moist, well drained soil is best but it tolerates many soil conditions.

**Sawtooth oak** (*Quercus acutissima*) 40 to 60' tall and wide. Grows 2' per year during its first twenty years. Golden catkin flowers in spring can be attractive. Foliage is very clean deep green in summer, often a good yellow in fall. Acorns drop early in fall. An impressive, high branched shade tree. Full sun. Well drained soil.

**Shingle oak** (*Quercus imbricaria*) 50 to 60' tall and wide. Can be larger. Grows 12 to 18" per year. Leaves unfurl red, are lustrous dark green in summer and become yellow to red-brown in fall. Full sun. Moist, well drained soil.

**Swamp white oak** (*Quercus bicolor*) 50 to 60' tall and wide. Can be larger. About 12" per year. With age, develops an impressive stout trunk and deeply furrowed bark. Fall color can range from yellow to maroon. Full sun. Moist to wet soil.