Ashes To Ashes: Alternative Tree Species to Use in the Aftermath of Emerald Ash Borer

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Background

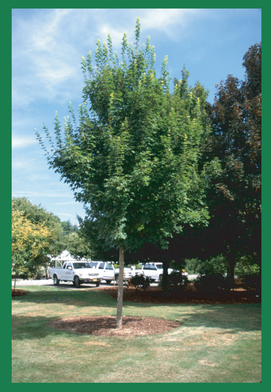
Emerald ash borer (EAB) (*Agrilus planipennis*) is an insect native to eastern Asia. It was first identified in the United States in southeast Michigan in 2002. The insect likely arrived on wood packing material from Asia. Adult insects are dark metallic-green and 1/2" long. EAB has spread to nearby states and Ontario, Canada, with smaller infestations in Virginia and Maryland. Larvae feed under bark, cutting off water and nutrient flow resulting in the death of infested trees within 2-4 years. Over 20 million native and exotic ash trees have died, devastating urban forests, natural forests, and woodlots. The insect is primarily moved by transportation of infested firewood, nursery stock, or ash logs. There are no known natural enemies of EAB in North America.

Why Did This Happen?

With increasing trade in the global market, exotic invasive species are becoming more problematic. These pests are nearly always introduced along with the products, containers, and packing materials of international trade, including lumber, shipping pallets, plants, and produce. Once a pest establishes itself, it can quickly devastate a host species. For example, Dutch elm disease (*Ophiostoma ulmi* and *O. novo-ulmi*) has devastated the urban forests of American elm (*Ulmus americana*). This was the predominant species used in many parts of the U.S. just as green ash (*Fraxinus pennsylvanica*) and white ash (*Fraxinus americana*) are today. Ashes were planted extensively as a replacement for American elm. They are readily available in the trade, easy to grow, have desirable ornamental characteristics and are tough, urban tolerant trees that withstand poor drainage and aeration, soil compaction, high pH and low fertility, drought, heat, deicing salts, restricted rooting area, and air pollution. However, tree cultivars including ash are propagated vegetatively (cuttings, budding), and therefore have little genetic diversity compared to seed propagated material. These monocultures of a few species or cultivars lead to increased pest susceptibility.

Examples Of Under Used, Urban Tolerant Alternatives To Ash

Acer × *freemanii*
Freeman maple



Acer miyabei 'Morton' State Street® miyabe maple

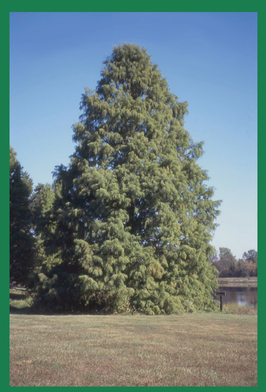
Ginkgo biloba
Ginkgo (use male cultivars only)

Gymnocladus dioica
Kentucky coffeetree

Maackia amurensis
Amur maackia

Phellodendron lavallei 'Longenecker' Eyestopper® corktree

Quercus muehlenbergii
chinkapin oak



Taxodium distichum
Baldcypress

Ulmus 'Morton Glossy' Triumph™ elm

How can we prevent this in the future?

Regrettably, it may not be possible to assure that this scenario does not occur again, but there are ways to decrease the risks. Increasing the diversity of species in the urban landscape will be crucial, but merely increasing the diversity is not enough... it also needs to be done carefully. Trees such as Norway maple (*Acer platanoides*), Amur maple (*Acer tataricum* subsp. *ginnala*), and black locust (*Robinia pseudoacacia*) are urban tolerant species, but are very invasive and should not be a choice for planting near natural areas. Native tree species can be used but are often not suitable for urban sites where soils are usually quite poor and trees are subjected to significant stress. Replacement of large quantities of one species by another single species is clearly not the answer either. A wide variety of urban tolerant, pest resistant, native and exotic species should be used to guard against the possibility of large-scale devastation by pests. The selection of widely available species is limited however, and the nursery and landscape industry will need to increase production and use of alternative tree species.

Santamour (1990) established tree planting guidelines that cities should plant no more than 30% of any family, 20% of any genus, and 10% of any species. For example, a city should not have more than 30% of its trees in the olive family (Oleaceae), 20% ashes (the genus *Fraxinus*), with only 10% of the species being green ash (*Fraxinus pennsylvanica*). Ideally, individual species should be scattered throughout the city to achieve both spatial and biological diversity. Age diversity is also important so a situation where all of the trees in an urban forest are the same age should be avoided. Unfortunately, the average life expectancy for urban trees is only 10-25 years (depending on species) (Urban 1989) and that of downtown trees is only 7 years. In general, a common sense approach of planting the right trees in the right places is key to avoiding widespread pest outbreaks.

Santamour, F.S., Jr. 1990. Trees for urban planting: Diversity, uniformity, and common sense. Proc. 7th Metropolitan Tree Improvement Alliance Conf., Lisle, IL.

Urban, J.R. 1989. Evaluation of tree planting practices in the urban landscape, pp. 119-127. *In*: Make our cities safe for trees: Proc. 4th Urban Forestry Conf. The American Forestry Assoc., Washington, D.C.