Alternatives for Invasive Landscape Trees in Georgia:

A Guide for Homeowners and Community Tree Managers
Contents

Introduction ..................................................................................................................................................................1
What is the Danger of Invasive Species? ................................................................................................................1
The Benefits of Going Native .................................................................................................................................2
Coder Planting Zone Map for the State of Georgia ..................................................................................................2
Right Tree Right Place .............................................................................................................................................3

Invasive or Non-native Trees

Acer palmatum (Japanese maple)
Ailanthus altissima (tree-of-heaven)
Albizia julibrissin (mimosa)
Broussonetia papyrifera (paper-mulberry)
Cinnamomum camphora (camphor tree)
Citrus trifoliata (trifoliate orange)
Cornus kousa (Chinese dogwood)
Cunninghamia lanceolata (Chinese fir)
Firmiana simplex (Chinese parasol tree)
Koelreuteria paniculata (goldenrain tree)
Lagerstroemia indica (crape myrtle)
Melia azedarach (china berry)
Morus alba (white mulberry)
Paulownia tomentosa (royal paulownia or princestree)
Phellodendron amurense (amur cork tree)
Pyrus calleryana (callery pear cultivars)
Quercus acutissima (sawtooth oak)
Robinia pseudoacacia (black locust)
Salix babylonica (weeping willow)
Triadica sebifera (Chinese tallowtree)
Ulmus parvifolia (Chinese or lacebark elm)
Vitex agnus-castus (lilac chaste tree)

Native Alternatives

Acer floridanum (Florida maple or Southern sugar maple)
Ailanthus serrulata (hazel alder)
Betula nigra (river birch)
Carpinus caroliniana (American hornbeam)
Cercis canadensis (Eastern redbud)
Celtis laevigata (sugarberry)
Cledastris kentukea (yellowwood)
Cornus florida (flowering dogwood)
Cretaegus viridis (green hawthorn)
Diospyros virginiana (persimmon)
Gleditsia triacanthos (honeylocust)
Helispa diptera (two-winged silverbell)
Ilex opaca (American holly)
Ilex vomitoria (yaupon)
Juniperus virginiana (Eastern redcedar)
Liriodendron tulipifera (tulip poplar or yellow-poplar)
Magnolia virginiana (sweetbay magnolia)
Morus rubra (red mulberry)
Nyssa sylvatica (black gum)
Ostrya virginiana (Eastern hop hornbeam)
Pinus echinata (short leaf pine)
Pinus taeda (loblolly pine)
Platanus occidentalis (American sycamore)
Prunus serotina (black cherry)
Quercus alba (white oak)
Quercus falcata (Southern red oak)
Quercus lyrata (overcup oak)
Quercus michauxii (swamp chestnut oak)
Quercus phellos (willow oak)
Quercus shumardii (Shumard oak)

References .................................................................................................................................................................25
Introduction

Homeowners and community tree managers are on the forefront of a fight against introduction of invasive species. Every landscape decision has a direct impact on surrounding ecosystems, so citizens must be aware of introducing invasive plants into urban landscapes near natural areas.

Shade and street trees are an indispensable component of any landscape planting, especially in the South where they provide relief from summer sun and heat. These urban trees also contribute other “ecosystem services” like adding monetary value to properties, softening harsh urban hardscapes, providing psychological relief, and reducing heating and cooling costs, as well as reducing soil erosion, controlling and filtering storm water, and providing wildlife habitat and food.

What is the danger of invasive species?

Invasive species are not native to an ecosystem and live free from natural predators, parasites, and competitors. As a result, their populations may increase rapidly, causing harm to the economy, environment and human health. Native trees can be weedy, but introduction of exotic tree species has potential to cause greater damage due to a lack of effective biological and climatic control factors. Invasive species can out-compete, displace or kill native species and disrupt vital ecosystem functions such as wildlife food and habitat, water flow, nutrient cycling and soil health.

Desirable traits of urban and suburban trees are fast growth— to provide quick shade and visual impact— small to medium mature size— to accommodate small urban spaces— and aesthetics— canopy shape, showy flowers, etc. Unfortunately, many fast-growing species could also be non-native or even invasive, and uninformed homeowners and landscape designers may choose such invasive species based on the aforementioned desired qualities, not knowing the ecological dangers of their decision.

Planting certain species of trees also invites disaster in the form of invasive insects or diseases for which these particular species may serve as habitat, food or host. For instance, tree-of-heaven (Ailanthus altissima) is a preferred reproductive host for an invasive agricultural pest known as brown marmorated stink bug (Halyomorpha halys). Even some native species such as ash (Fraxinus spp.) should be avoided due to the danger of the invasive emerald ash borer beetle (Agrilus planipennis), and non-resistant cultivars of American elm (Ulmus americana) due to the danger of Dutch elm disease (caused by fungal pathogen Ophiostoma spp.).

Figure 1: Callery pear cultivars (Pyrus calleryana), a favorite among homeowners and landscapers, are known for spreading along roadsides and other disturbed areas.

Figure 2: Chinaberry (Melia azedarach) was a popular imported ornamental in the mid-1800s and now outcompetes native trees and vegetation on disturbed sites.
Image: D. Moorhead, University of Georgia, Bugwood.org.
Benefits of Going Native

Native species of trees are adapted to their ecosystem. They have had millennia to develop alongside fellow species, and have their ecological niche and role to play in wildlife habitat and the food net. Native trees frequently have comparable characteristics to invasives, without the danger of ecosystem damage. They are well-suited for the local climate of their geographical region and benefit native animals.

With urban areas expanding at an unprecedented rate, and the introduction of invasive and/or non-native plant species in landscaping of new developments, local ecosystems can use all the help they can get from citizens. It is extremely important to mimic natural landscapes in our green spaces so as to preserve local ecosystems.

The native trees suggested for planting in this publication will do well in the state of Georgia, according to the planting zone map below. However, this does not guarantee success. Use of local genetic planting stock (“provenance”) is your best bet. Be sure to work with your local nursery, ask about the source of their stock, and request locally-adapted trees. If you can find trees genetically adapted to your local climatic region, you will maximize growth and vigor, and minimize heat stress, winterkill, frost damage, and insect and disease problems.

It is also important to select the proper native tree species to fill a particular planting spot, taking into consideration: above- and below-ground space, light levels, soil moisture/drainage, rooting space, and other potential conflicts. A tree may be suited to the local climate, but still not thrive due to issues with where it is planted. The most expensive planting is a failed planting—perhaps a tree that does not survive to maturity to provide full ecosystem benefits, or a mature tree causing significant infrastructure damage as it grows in size.

Right Tree Right Place

Figures 4 & 5: The structure of these trees has been compromised due to extensive pruning, which could have been avoided had such large trees been placed away from overhead utilities. These trees will not provide full ecosystem benefits due to missing canopy, and hazardous decaying branches may develop over time from many pruning wounds. Images: Stephen F. Austin State University, Bugwood.org

Figures 6-9 (clockwise from above): Trees not given enough rooting space will be stressed and can become hazards as their size increases; improperly placed trees can cause significant infrastructure damage; trees can also engulf obstructions, which can compromise their structural stability. Images: R. Cyr, Greentree; J. O’Brien, USDA Forest Service; W. Fountain, University of Kentucky; J. LaForest, University of Georgia, Bugwood.org
After selecting the proper location and the proper tree, the next most important step is proper planting. This will give your carefully-selected tree a leg up in the competitive urban environment. Proper planting is conducive to root growth and establishment, which ensures your tree will get enough essential elements and water.

First, the planting hole should be wider than it is deep, at least 1 to 2 feet wider than the root ball, and no deeper (Figure 8). The bottom of the hole should be firm so that the root collar (flared section) of the tree does not settle below the ground line after planting, and the soil around the hole can be loosened to promote root growth. Allow for a slow taper. Any native soil that is removed should be cleared of sod and needs no amendments before backfilling.

Ensure that your tree is upright and straight before backfilling only up to the root flare. Gently and firmly tamp the backfilled soil around the root ball with your foot, but do not compact the soil. The purpose is to reduce air pockets but allow for root penetration. Gently watering after planting should get rid of any smaller air pockets and allow soil to settle. Never pile dirt or mulch around the base of the tree. You should be able to see the root flare above the ground.

Most trees do not require staking unless they are located in a windy area or on a slope. Letting a new stem sway in the breeze allows for the development of proper stem taper and strengthens the root system. If staking is required, stake on opposite sides at mid-height on the tree (Figure 9) and remove any implements after a year to prevent the tree from growing over them (Figure 10). A mulch ring 2-3 inches deep and larger than the size of the planting hole should be installed to maintain soil moisture around the root ball (Figure 11); never pile mulch up against the trunk (Figure 12), as this holds moisture against the tree's root flare, providing an environment for fungus and pests to thrive.
**Non-native or Potentially Invasive Trees**

**Firmiana simplex**  
Chinese parasoltree  
- Invasive  
- Spreads by prolific seeding (self-fertilizes)

**Morus alba**  
white mulberry  
- Invasive  
- Messy fruit  
- Spreads by prolific seeding and hybridizing with native species

**Koelreuteria paniculata**  
goldenrain tree  
- Non-native  
- Invasive potential  
- Spreads by planting

**Lagerstroemia indica**  
crapemyrtle  
- Non-native  
- Spreads by over-planting, prolific seeding and sprouting  
- Invasive potential

**Paulownia tomentosa**  
royal paulownia (princesstree)  
- Invasive  
- Colonizes marginal habitats  
- Extremely fast-growing  
- Spreads by prolific seeding and sprouting

**Melia azedarach**  
chinaberry  
- Invasive  
- Poisonous seeds  
- Releases chemical that prevents growth of other plant species (allelopathy)  
- Spreads by prolific seeding and forming thickets

**Phellodendron amurense**  
amur corktree  
- Invasive potential  
- Inhibits oak regeneration  
- Spreads by over-planting and prolific seeding

**Pyrus calleryana**  
callery pear  
(many cultivars)  
- Invasive  
- Poor structure  
- Susceptible to storm damage  
- Spreads by over-planting and prolific seeding
**Quercus acutissima**  
**sawtooth oak**  
- Invasive potential  
- Spreads by over-planting and prolific seeding

**Robinia pseudoacacia**  
**black locust**  
- Weedy native  
- Short life span  
- Many insect and disease issues  
- Brittle wood  
- Susceptible to storm damage  
- Spreads by prolific seeding

**Salix babylonica**  
**weeping willow**  
- Non-native  
- Brittle wood; susceptible to storm damage  
- Aggressive rooting behavior; disrupts and damages stream health  
- Spreads by sprouting and seeding

**Triadica sebifera**  
**Chinese tallowtree**  
- Invasive  
- Spreads by prolific seeding  
- Fallen leaves release chemicals that inhibit growth of native plants

**Ulmus parvifolia**  
**Chinese (lacebark) elm**  
(many cultivars)  
- Invasive potential  
- Spreads by over-planting and prolific seeding  
- Brittle wood  
- Poor structure  
- Susceptible to storm damage

**Vitex agnus-castus**  
**lilac chastetree**  
- Non-native  
- Invasive potential  
- Spreads by seeding and over-planting

**Zelkova serrata**  
**Japanese zelkova**  
- Invasive  
- Over-planted  
- Poor structure  
- Susceptible to storm damage
**Acer floridanum**  
Florida maple (Southern sugar maple)

**Pros**  
- Tolerates drought once established  
- No serious pest or disease issues  
- Easily found in nurseries  
- Beautiful fall color

**Cons**  
- Messy - sheds bark

**Site**  
- Full sun to partial shade  
- GA planting zones: 1-7

---

**Betula nigra**  
river birch

**Pros**  
- Easily found in nurseries  
- Winter interest  
- Tolerates drought once established

**Cons**  
- Messy - sheds bark

**Site**  
- Full sun to partial shade  
- Tolerates moist to dry soils  
- GA planting zones: 1-7

---

**Carpinus caroliniana**  
American hornbeam

**Pros**  
- No serious insect or disease issues

**Cons**  
- Slow-growing

**Site**  
- Shade  
- Prefers moist soils  
- GA planting zones: 1-7

---

**Alnus serrulata**  
hazel alder

**Pros**  
- No serious insect or disease issues  
- Attracts wildlife  
- Tolerates poor soils

**Cons**  
- Weak wood  
- Multi-stemmed; needs pruning for form

**Site**  
- Full sun to partial shade  
- Prefers moist soils  
- Good for stream rehabilitation  
- GA planting zones: 1-7
**Native Alternatives**

### Celtis laevigata
**sugarberry**

**Pros**
- Tolerates drought once established
- Attracts wildlife
- Tolerates air pollution, flooding and poor soils
- Fast-growing

**Cons**
- May self-seed and become weedy
- Surface roots
- Weak wood

**Site**
- Full sun to partial shade
- GA planting zones: 1-7

### Cladrastis kentukea
**yellowwood**

**Pros**
- Tolerates dry soils once established
- Showy flowers

**Cons**
- Susceptible to sunscald
- Fragile branches

**Site**
- Full sun
- GA planting zones: 1-6

### Cercis canadensis
**Eastern redbud**

**Pros**
- Showy flowers
- Small size
- Easy to find in nurseries

**Cons**
- Prone to cankers, wilts and diebacks
- May self-seed
- Messy seed pods

**Site**
- Full sun to partial shade
- GA planting zones: 1-7

### Celtis laevigata
**sugarberry**

**Pros**
- Tolerates drought once established
- Attracts wildlife
- Tolerates air pollution, flooding and poor soils
- Fast-growing

**Cons**
- May self-seed and become weedy
- Surface roots
- Weak wood

**Site**
- Full sun to partial shade
- GA planting zones: 1-7

### Cladrastis kentukea
**yellowwood**

**Pros**
- Tolerates dry soils once established
- Showy flowers

**Cons**
- Susceptible to sunscald
- Fragile branches

**Site**
- Full sun
- GA planting zones: 1-6

### Cercis canadensis
**Eastern redbud**

**Pros**
- Showy flowers
- Small size
- Easy to find in nurseries

**Cons**
- Prone to cankers, wilts and diebacks
- May self-seed
- Messy seed pods

**Site**
- Full sun to partial shade
- GA planting zones: 1-7

### Cornus florida
**flowering dogwood (many cultivars)**

**Pros**
- Showy flowers
- Small size
- Easy to find in nurseries

**Cons**
- Prone to anthracnose
- Intolerant of heat and drought

**Site**
- Must be planted in partial shade
- Requires moist, well-drained soil
- GA planting zones: 1-7
### Native Alternatives

#### Crataegus viridis
- **green hawthorn**

**Pros**
- Attracts wildlife
- Small size
- Tolerates drought, dry soils and pollution
- ‘Winter King’ variety easy to find in nurseries

**Cons**
- Messy fruit
- Thorns
- Insect and disease issues similar to apple trees

**Site**
- Sun to partial shade
- GA planting zones: 1-4

#### Gleditsia triacanthos
- **honeylocust**

**Pros**
- Tolerates drought, rocky soils and pollution
- Easy to find in nurseries - choose thornless varieties
- Winter interest
- Showy flowers

**Cons**
- Susceptible to pests and disease, locust leafminer
- Messy seed pods, may become weedy
- Over-planted in the past

**Site**
- Full sun
- Wide crown best-suited for large lawns
- GA planting zones: 1-6

#### Diospyros virginiana
- **persimmon**

**Pros**
- Tolerates drought, rocky soils and pollution
- Edible fruit
- No serious insect or disease issues
- Easy to find in nurseries
- Attracts wildlife
- Winter interest

**Cons**
- Dioecious - female *and* male trees needed for fruit

**Site**
- Full sun to partial shade
- GA planting zones: 1-7

#### Halesia diptera
- **two-winged silverbell**

**Pros**
- Showy flowers
- Small size
- No insect or disease issues

**Cons**
- May be difficult to find in nurseries
- Multi-stemmed; needs pruning for shape/structure

**Site**
- Partial sun to partial shade
- Prefers moist soil
- GA planting zones: 1-7
**Native Alternatives**

**Ilex opaca**
*American holly*

**Pros**
- Evergreen
- Attracts wildlife
- Easily found in nurseries

**Cons**
- Slow-growing
- Dioecious - needs female and male trees for fruit

**Site**
- Sun to partial shade
- Needs moist soil and shade in hot climates
- GA planting zones: 1-7

**Ilex vomitoria**
*Yaupon holly*

**Pros**
- Winter interest
- Attracts wildlife
- Tolerates drought once established
- Good screen
- Smaller size (up to 25 ft tall)

**Cons**
- May self-seed or sprout
- Dioecious - needs female and male trees for fruit

**Site**
- Full sun to partial shade
- GA planting zones: 1-7

**Juniperus virginiana**
*Eastern redcedar*

**Pros**
- Tolerates drought and heat
- Good for screens
- Evergreen
- Easy to find in nurseries

**Cons**
- Rust diseases, bagworms
- Allergy issues for certain people
- Dioecious - needs female and male trees for fruit

**Site**
- Full sun
- GA planting zones: 1-7

**Liriodendron tulipifera**
*Tulip- or yellow-poplar*

**Pros**
- Showy flowers
- Fast-growing
- Attracts wildlife

**Cons**
- Intolerant of hot, dry sites

**Site**
- Full sun
- Prefers moist, organically rich soil
- Large tree best-suited for large lawns
- GA planting zones: 1-7
**Native Alternatives**

**Magnolia virginiana**  
**sweetbay magnolia**

**Pros**
- Showy flowers  
- Attracts wildlife  
- Leaves have a pleasant lemon scent when crushed

**Cons**
- Does not tolerate colder winter temperatures

**Site**
- Partial Shade  
- Prefers moist soil  
- GA planting zones: 1-7

**Nyssa sylvatica**  
**black gum**

**Pros**
- Tolerates extremes of soil moisture  
- Attracts wildlife  
- No serious insect or disease issues  
- Beautiful fall color

**Cons**
- Slow-growing  
- Dioecious—female and male trees needed for fruit

**Site**
- Full sun to partial shade  
- Prefers moist to wet soils  
- GA planting zones: 1-7

**Morus rubra**  
**red mulberry**

**Pros**
- Tolerates drought and air pollution  
- No serious insect or disease issues  
- Attracts wildlife—edible fruits

**Cons**
- May self-seed  
- Messy fruit (avoid females)  
- Male trees can cause allergy issues for certain people

**Site**
- Full sun to partial shade  
- Prefers moist, well-drained soils  
- GA planting zones: 1-7

**Ostrya virginiana**  
**Eastern hop hornbeam**

**Pros**
- Tolerates drought once established  
- No serious insect or disease issues  
- Medium-sized tree for smaller spaces  
- Winter interest

**Cons**
- Slow-growing  
- Slow to establish following transplanting  
- May be difficult to find in nurseries

**Site**
- Full sun to shade  
- GA planting zones: 1-7
**Native Alternatives**

### Pinus echinata
*shortleaf pine*

**Pros**
- Tolerates drought and dry soil
- Fast-growing
- Good screen
- Evergreen

**Cons**
- Messy pollen, needles and cones

**Site**
- Full sun to partial shade
- GA planting zones: 1-7

### Pinus taeda
*loblolly pine*

**Pros**
- Tolerates drought and dry soil
- Fast-growing
- Good screen—evergreen

**Cons**
- Messy pollen, needles and cones
- Surface roots
- Susceptible to fusiform rust and pine beetles

**Site**
- Full sun
- Good for areas with drainage problems
- GA planting zones: 1-7

### Prunus serotina
*black cherry*

**Pros**
- Showy flowers
- Attracts wildlife
- Fast-growing

**Cons**
- Susceptible to several pests and diseases
- Foliage is poisonous if eaten in large quantities
- Messy fruit

**Site**
- Full sun
- Large tree best-suited for large lawns
- GA planting zones: 1-7

### Platanus occidentalis
*American sycamore*

**Pros**
- Fast-growing
- Tolerates flooding and some drought
- Winter interest

**Cons**
- Messy leaves, bark and fruit; surface roots
- Allergy issues for certain people

**Site**
- Full sun to partial shade
- Prefers moist soils
- Large tree best-suited for large lawns
- GA planting zones: 1-7

---

*Images: R. Routledge, Sault College; R. Webb; A. Bridgman, SC Department of Natural Resources; T. Davis Sydnor, The Ohio State University, Bugwood.org*
Native Alternatives

**Quercus alba**
white oak

**Pros**
- No serious pest issues
- Attracts wildlife
- Tolerates drought once established

**Cons**
- Slow-growing
- Anthracnose and oak leaf blister
- Messy fruit litter

**Site**
- Full sun to partial shade
- Moist to dry soils
- Large tree best-suited for large lawns
- GA planting zones: 1-7

**Quercus lyrata**
overcup oak

**Pros**
- Attracts wildlife
- No serious pest or disease issues

**Cons**
- Slow-growing
- Messy fruit litter

**Site**
- Full sun to partial shade
- Prefers moist soil; good for areas with drainage problems
- GA planting zones: 1-7

**Quercus falcata**
southern red oak

**Pros**
- Attracts wildlife
- No serious pest or disease issues
- Drought tolerant once established

**Cons**
- Messy fruit litter
- May need pruning for form

**Site**
- Full sun
- Tolerates dry soils
- Large tree best-suited for large lawns
- GA planting zones: 1-7

**Quercus michauxii**
swamp chestnut oak

**Pros**
- Tolerates drought once established
- Showy bark and fall color
- Attracts wildlife
- No serious insect or disease issues

**Cons**
- May take 20-25 years to produce Acorns
- Messy fruit

**Site**
- Full sun to partial shade
- Tolerates wet soils
- Large tree best-suited for large lawns
- GA planting zones: 1-7
Native Alternatives

**Quercus phellos**
*willow oak*

**Pros**
- Fast-growing
- Tolerates pollution
- Attracts wildlife
- Good pest resistance

**Cons**
- Chestnut blight, anthracnose, oak leaf blister, cankers
- Messy fruit litter

**Site**
- Full sun to partial shade
- Prefers moist to wet soil
- Large tree best-suited for large lawns
- GA planting zones: 1-7

**Quercus shumardii**
*Shumard oak*

**Pros**
- Attracts wildlife
- No serious pest or disease issues
- Fast-growing
- Tolerates drought once established

**Cons**
- May need pruning for form
- Messy fruit litter

**Site**
- Full sun to partial shade
- Tolerates a variety of soil conditions
- GA planting zones: 1-7

References


