

Tennessee Tough Tree Team

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Urban trees are a great asset. They improve health, social behavior, work output, learning, and property values. Not just any tree will do, however.

We see millions of dollars wasted every year on dead trees and property damage. What should have been an asset becomes a waste or liability. Some of this is due to poor planting and care. But mostly it is due to the fact that

- 1. many species just can't take our tough urban conditions. Examples include dogwood, white pine, and sugar maple in many parts of the state**
- 2. we plant species that get too large for the space available. This can cause severe problems of buckled streets and sidewalks, and damaged houses. Example include yellow poplar, sycamore, and red maple.**
- 3. Some species are very susceptibility to diseases. Example: Leyland cypress.**

We carefully evaluated all species based on the following important criteria.

1. Drought tolerance
2. Reflected heat tolerance
3. Compaction tolerance
4. Longevity
5. Pest resistance
6. Easy of transplanting
7. Availability
8. Growth rate
9. Pruning needs
10. Cost
11. Appearance

Few trees met all or most of these criteria. Many species are not well suited – or suited at all – to tough urban situations. Any tree not included on this list had some major drawback.

We have divided trees into three size classes:

- Small – 15 to 25 feet tall
- Medium – 25 to 45 feet tall
- Large – more than 45 feet tall

Welcome to the “Tree Survival Bowl!”

Small Tree League

First string Small Trees

American smoke tree, *Cotinus obovatus*

- + extremely drought tolerant
- + easy to transplant
- + largely pest free
- + hazy clusters of tiny flowers
- + foliage is attractive in summer and brilliant in fall

- - often needs formative pruning
- - grows slowly on poor sites, but surprisingly fast on good ones.

American smoke is perfect except for initial pruning need, which is not difficult. Can get Verticillium wilt. Should be planted more.

Crape myrtle, *Lagerstroemia persica*

- + very tough
- + long lived
- + pest free
- + easy to transplant
- + beautiful all summer
- + does not interfere with traffic

- - often requires skilled formative pruning
- - victim of mindless control-freak topping

The best tree, along with wireless zelkova, for under low powerlines and close to streets

Small Trees Second String

Chinese fringe tree, *Chionanthus retusus*

- + unmatched spring flowers
- + pretty good drought and heat tolerance
- + pest free
- + good yellow fall color
- + sun or shade

- - a little hard to transplant
- - usually requires pruning to attain single trunk

Beautiful tree. Only possible drawback is that it is not as drought tolerant as others listed here. However, Michael Dirr reports it did well in Wichita KS.

Redbud *Cercis canadensis* (Eastern redbud) or *Cercis reniformis* (Oklahoma redbud) C. reniformis var "Red Sunset" is toughest and very beautiful

- + Tough
- + Easy to transplant
- + popular flowers
- + fast initial growth

- - short lived
- - no fall color

A great popular tree. If it dies after 25 years, just replant and fast growth soon gives you a new tree

Crabapple *Malus* species

- + showy flowers
- + good form
- + easy to transplant
- + fairly drought tolerant

- - short lived
- - fruit
- - diseases in non-resistant varieties

Main problem is short life

Top draft choices Small Trees

Amur maackia, *Maackia amurensis*

- + extremely tough
- + pest free
- + very long lived
- + transplants well
- + single trunk, perfect shape
- + June flower spikes

- - hard to find
- - slow growth

- - can eventually get a little too big to qualify as a small tree
- - cost
- - no fall color

A near-perfect tree if it were just more available. A few nurserymen are starting to notice it

Dwarf ginkgo, *Ginkgo biloba* var “WB” and others

- + perfect formal lollipop shape
- + takes the worst urban conditions
- + very long lived
- + pest free

- - expensive
- - hard to find

Just the tree for formal look on drive entrances.

Wireless zelkova *Zelkova serrata* var “Schmidtlow”

- + perfect flat crown
- + very drought tolerant
- + nearly pest free
- + transplants well

- - available only from Schmidt Nursery in Boring Oregon
- - expensive

This is the perfect small tree, except for shipping and price. Available from Schmidt Nursery in Oregon.

Medium-sized League

Mid-sized trees should be planted a lot more. They are big enough to provide usable shade, but not big enough to fall on houses. Their roots don't require the large areas that big trees do, and so they have a lot more applications. We don't have many mid-sized natives, so I draw heavily on imports.

First String Mid-Sized Trees

Chinese Pistache *Pistache chinensis*

- + Extremely drought and heat resistant
- + Easy to transplant
- + Pest free
- + Very long lived
- + Strong limbs
- + Grows fairly fast (over three feet per year in our experience)
- + Good shape
- + Fall color like a sugar maple

- Can be leggy and awkward when small
- May require initial selective pruning to provide a more attractive branching pattern. Easily done, though.

This staff, this may be the best mid-sized tree. It is so tough, it is commonly used in Dallas Texas! It is picking up in popularity in the nursery trade, and it should. This tree should be used almost as commonly as red maple is now.

Persian Parrotia *Parrotia persica*

- Very tough and drought resistant
- Pest free, except for Japanese beetles
- Long lived
- Strong
- Wonderful red fall color

A little slow growing, (moderate growth rate – perhaps 1 ½ to 2 feet per year) but other than that it is perfect. Some horticulturalists rate this tree at the top of its size class. The “plain” species is bushy; variety. Variety “Vanessa” is more tree-like, and “Ruby vase” has a narrow form.

Lacebark elm *Ulmus parvifolia*

- + tough
- + tolerates compaction and wetness

- + trim form
- + beautiful bark
- + relatively pest free
- + grows fairly fast
- - branches sometimes sag and need crown raising

A popular standard, and it should be. Variety 'Alee' is best suited for traffic areas.

American persimmon *Diospora virginiana*

- + takes drought
- + tolerates compaction well
- + long-lived
- + strong
- + interesting bark, glossy leaves
- + fruit, if you like fruit.
- - can get bigger than mid-sized on good sites
- - fruit can be messy

This is probably the most under-planted native tree. Deserves a lot more use. If you don't like fruit, get a male tree.

Overcup oak *Quercus lyrata*

- + takes drought and wetness well
- + tolerates compaction well for an oak
- + strong
- + long lived
- + good for wildlife
- - hosts a number of insects, as do all oaks, but these are seldom a problem. Gypsy moth will be a problem
- - on good site can get a bit bigger than mid-sized
- - like all oaks, can be a little difficult to transplant

A great native that is fast gaining popularity among landscape architects. Bugs it hosts make it great for birds but very seldom harm the tree. Hopefully we see a lot more of overcup oak.

American hophornbeam *Ostrya virginiana*

- + very tolerant of drought
- + strong

- + pest free
- + long lived
- + very trim dense form
- + attractive winter twigs
- + yellow fall color

- - slow growing

This is a wonderful, durable native with sculpted looks. Only problem is slow growth.

Goldenrain tree *Koelrueteria panniculata*

- + tough
- + easy to transplant
- + pest free
- + yellow flowers

- - leaves sometimes crinkle and brown toward the end of a dry summer

Quite serviceable and has no real drawbacks. Do not confuse with golden chain tree, which can be slightly invasive

Top Draft Choices Mid-Sized Trees

Hedge maple *Acre campestre*

- + Very drought and hear tolerant
- + Good fall color

- - usually requires some early pruning
- - not commonly available

Want a tough maple? This one from the Mediterranean and North Africa is it.

Chalk maple *Acre luecoderma*

- + drought tolerant
- + takes sun or shade
- + good fall color

- - not available

This is a great Piedmont native. Why don't we use it?

Turkish filbert *Corylus colurna*

- + Exceedingly drought tolerant
- + Bright dark green even in severe drought
- + upright, sculpted, dense form
- + edible nuts
- + pest free

- - not available locally

This is a fabulous landscape tree. Why is it only grown up north?

Mancana ash (Manchurian ash) *Fraxinus mandshurica* var. 'Mancana'

A possible replacement for green ash? This is not available in the mid-South right now, but is widely planted up north in some parts of the arid west. Beautiful sculpted oval, borer resistant. It does well into zone six. But we might be zone seven now.

Tree Big League

Large trees should be planted only in large spaces. They look fine in a small space when young, but when they outgrow the space they can become a danger to houses and be expensive to remove.

First String Large Trees

American elm variety Princeton *Ulmus American* var 'Princeton'

- + drought and wet tolerant
- + tolerates compacted soil
- + grows fast
- + disease resistant
- + unmatched vase shaped crown

- - *a little expensive*

*If you are old enough, you can remember huge umbrellas of elm crowns arching over streets. That American icon was lost with the arrival of Dutch elm disease, but now it's back! You really can't beat this tree. An actual spreading **shade** tree, not one of those narrow- and/or compact crowned specimen trees that are overly popular now.*

There are several varieties of disease-resistant elm now, but the consensus in the tree trade is that Princeton is best suited to Tennessee.

Swamp white oak *Quercus bicolor*

- + tolerates drought, wetness, and compaction
- + very strong
- + very long lived
- + beautiful foliage
- + great for wildlife

- - can be slow growing on poor sites. But on good sites it will surprise you
- - like all white oaks, can be a little difficult to transplant, especially the large calipers
- - like all oaks, hosts a large number of insects, but they are seldom a problem. Gypsy moth will be a problem

Beautiful white oak. White oak is under-planted because of two above drawbacks, but should be planted much more, especially where long-term benefits are intended. Foliage is dark glossy green on top and silver on the bottom.

Bur oak *Quercus macrocarpa*

- + long lived
- + strong
- + takes moderate wetness and compaction
- + great for wildlife

- - like all oaks, hosts a large number of insects, but they are seldom a problem

A great long-term investment for a big place

Willow oak *Quercus phellos*

- + all the advantages of other oaks
- + small leaves make for less litter

A widely-used classic. Root rot is starting to be a problem with this species in some situations

Ginkgo *Ginkgo biloba*

- Very drought tolerant
- Very tolerant of compaction
- Very tolerant of air pollution
- Strong
- Long lived
- Pest free
- Electrifying bright yellow fall foliage

This is the ultimate urban tree. Can't beat it. Just be sure to plant a male, as females bear stinky fruit.

Baldcypress *Taxodium distichum*

- The most tolerant tree of wet soil
- Tolerates dry soil
- No pests
- Very long lived
- Nice narrow conical form

No disadvantages, except that it is a specimen tree and really doesn't provide a lot of "sit under" shade. .

Japanese Zelkova *Zelkova serrata*

- + highly drought tolerant
- + nearly pest free
- + good spreading shape
- + fall color

A Japanese relative of elm, smaller than our elm. Varieties “Green vase”, “Village Green”, and” Halka” are good varieties. Becoming popular with landscape architects.

Kentucky coffee tree *Gymnocladus dioicus*

- + exceedingly drought resistant once established
- + pest free
- + strong
- + beautiful doubly compound leaves

- - a little difficult to transplant, especially in large sizes
- - slow growing – one foot per year
- - females bear large bean pods
- - sometimes sprouts from roots in wild

Rare in the wild. An individualistic tree – each has a unique winter form.

Thornless honeylocust *Gleditsia triachanthos*

- + drought tolerant
- + tolerates compaction
- + fast growing
- + good form
- + light filtered shade

- - has some pest problems that become especially serious when overplanted
- - wood is not weak, but not exceptionally strong

*This is a **great** shade tree that in the past has on occasion developed some pest problems when too much is planted to close together. One of the rare trees that casts a light filtered shade. If not overused, it belongs on “First String.”*

Large trees: second string

Blackgum *Nyssa silvatica*

- + elegant tree with very deep crown
- + long lived
- + strong wood and form
- + pretty much disease free

- + unmatched early fall scarlet leaves
- + birds like fruit
- + one of the few large-maturing landscape trees that can grow in the shade.
- - somewhat hard to transplant
- - needs some TLC to get established
- - grows slowly

This relative of the dogwood is a beautiful tree. We should plant it more. A great advantage is that it can be planted in the shade of other trees, and will serve as their replacement eventually.

Top Draft Picks Large Trees

Hardy rubber tree *Eucommia ulmoides*

- + very drought tolerant
- + pest free
- + long lived
- + leaves are always glossy and green
- + dense shade, if that is your preference
- - slow growing
- - some people are allergic to the latex in the leaf
- - no fall color
- - difficult but not impossible to find

Very tough tree that never gets leaf scorch and is always dark green. Deserves to be planted more. Planted with great success by the City of Cleveland TN.

Black maple and Florida maple, *Acer nigrum* and *Acer barbatum*

More drought-tolerant than sugar maple. Black maple is native to middle Tennessee, where it grows even on the driest rocky ridges. Black maple is not grown commercially in Tennessee. WHY? Southern sugar maple (Florida maple) is a slightly smaller version of northern sugar maple. It is, native further south..

Team Evergreen

First String Evergreens

Eastern redcedar *Juniperus virginiana*

- + Extremely drought tolerant
- + Tolerant of shallow poor soil
- + Native
- + Easy to transplant
- + Many cultivars with various shapes and colors

Chinese Juniper *Juniperus chinensis* var“Hetzii”

- + Very drought tolerant
- + Grows fairly fast at first, until it “tops out” at about 15 to 18 feet

Cedrus atlantica “Glauca”

- + Beautiful color and form
- + Loves our humidity and heat
- + Grow like a weed

Yellow pines *Pinus taeda* (loblolly) *Pinus echinata* (shortleaf)

- + Grow fast and tall
- +Cast light shade, if that is desired
- + Very inexpensive

- - Foliage thins as it matures, reducing its usefulness as a screen

- - Can gets pine beetle
- - Doesn't do so well on shallow limey soil

Cryptomeria

- + Beautiful dense foliage

- - Not as tolerant of heat as cedar, for instance, but in most cases quite serviceable
- - Expensive

Oriental spruce *Picea orientalis*

- + Most drought resistant of the spruces that grow here
- + Trim conical form, short needles

Being Scouted – Top Team Evergreen Contender:

Arizona Cypress *Cupressus arizonica*

- + Beautiful
- + Fast growing here
- + Extremely drought tolerant

- - Gets Serridium canker, but not nearly to the extent that Leyland cypress does

Arizona cypress may be a good replacement for Leyland cypress, but it we have not seen it perform enough to make a recommendation yet. We welcome comments.

“Cheerleaders” - Some great trees that aren’t tough

- Sugar maple
- White pine
- Yellowwood Tennessee Endangered Tree. Beautiful. Needs good soil and protection
- Serviceberry (*Amelanchier larae*is “Snowcloud” has best tree form)
- Dogwood, varieties like “Cherokee Princess” that resist powdery mildew and rust
- Paw paw (Great foliage, tasty fruit)
- Tall Stewartia (dogwood-like flowers, cinnamon bark)
- Beech
- Linden or basswood (used in surprisingly tough urban applications, though)

Wash-outs

Bradford pear (aka “Badford pear”)

- Weak wood
- Very poor branch structure
- Very short life span
- Stinky flowers
- *Invasive*

Leyland cypress.

- **Highly susceptible to** cancer diseases and always dies within 10 or 15 years of planting.

Silver maple

- Weak wood
- Twigs break off and litter ground
- Surface roots
- No fall color

Ready to retire? (Think before you plant these)

Red maple

- Not notably drought tolerant
- Gets sun scald
- Weak wood, breakage
- Shallow roots
- Way overplanted

Pin oak

- Especially susceptible to disease (oak wilt, bacterial leaf scorch)
- Susceptible to chlorosis (iron deficiency) on high pH soils
- Overplanted

Ornamental cherry

- Not highly drought tolerant
- Susceptible to many pests
- Relatively short lived

Benched (in town anyway)-

Tulip tree

- Weak wood, breakage
- NOT drought tolerant

- Intolerant of compaction
- Gets collar rot in many yard soils
- TOO BIG for most yards

Sycamore

- Gets anthracnose to the point of being a real problem
- Big, tough, hairy leaves
- Invasive roots
- Grows quickly to a huge size