Trees and Shrubs for Sustainable Built Environments
HORT 306 Fall 2018

Plant List 2
Large & Medium Deciduous Trees I

Reading Assignments
In Landscape Plants For Texas And Environs, Third Ed.

- Intro materials on trees (p. 681, 997) and shrubs (p. 682, 807)
- Family descriptions for:
  - Aceraceae (p. 65), Anacardiaceae (p. 67), Betulaceae (p. 71), Bignoniaceae (p. 71), Boraginaceae (p.72), Ebenaceae (p. 80), Fagaceae (p. 82), Ginkgoaceae (p. 84), Hamamelidaceae (p. 84), Hippocastanaceae (p. 84), Juglandaceae (p. 85), Platanaceae (p. 95), Salicaceae (p. 100), Sapindaceae (p. 101), Taxodiaceae (p. 104)
- Descriptions for individual species
  See page listings on Plant List 2 Handout
  (also available under lists on course website)

Parklands & Naturalizing

Large trees (ex. Platanus occidentalis) in excess of 50’ typically exceed site requirements for urban / suburban plantings

Urban / Suburban Lawn and Street Trees

Medium trees, 25’ to 50’ or so, fit much more effectively with most urban and suburban applications
**Growth Habit Matters**

Growth habit or canopy form can be critical to design function and maintenance goals in urban/suburban locations.

- *Quercus virginiana*
- *Ulmus americana ‘Princeton’*

**Specking the Right Size Avoids Maintenance Issues**

- “Crapemurder” is not just for Crapemyrtles
- Pruning to fit can cause maintenance problems, plant health issues, and liability concerns

**Ecosystem Services & Economic Contributions of Large Trees in Built Environments**

- Energy conservation – winter wind reduction, wind breaks, summer shade
- Carbon sequestration (storage)
- Biofiltration of water
- Biofiltration of air pollutants
- Reduction in storm water runoff & erosion control
- Supports wildlife / pollinators
- Social benefits – decreased healing times, improved mental health, better working environment (job satisfaction), potential crime reduction
- Increased property values by as much as 20%
- Economic multipliers for installation / maintenance expenditures (employment, taxes, etc.)

**What Is The Value Of These Trees On The National Mall?**
Ecological and Economic Costs of Large Trees in Built Environments

- Purchase and installation costs
- Costs of pruning, leaf removal, eventual tree removal
- Irrigation requirements of the trees
- Impacts on irrigation of surrounding plants
- Fertilizer / pesticide costs & ecological contamination
- Liability for fallen limbs/trees
- Storm damage to structures / debris removal
- Damage to foundations / sidewalks / drives other infrastructure
- Attracts all types of wildlife, not just desirable species
- Hiding places for criminals
- Wildfire potential
- Reduced summer air movement, negative impacts of shade

Acer rubrum
Red Maple

- Large, 40'-70' (100') tall, deciduous forest / shade tree
  - Larger in Eastern USA, variable hardiness by provenance, USDA z. 3 - 10
- Use clonal selections for reliable fall color: yellow, red, orange
- Rapid grower, but has pest / disease / physiological problems
  - Susceptible to salt and physiological leaf scorch,
    Mn chlorosis on high pH soils, dense shade & surface roots hinder turfgrasses,
    weak wood, weedy, graft incompatibility

Acer rubrum var. drummondii
Drummond Red Maple

- Better tolerance to heat and higher pH soils
- Good red flowers and fruit, can be weedy
- Native Texas variety, smaller in our region than species type; USDA zones 7 to 9
- Less cold tolerant than species type, but requires fewer chilling hours for budbreak

Acer buergerianum
Trident Maple

- Medium size deciduous Asian tree, 40' to 50' tall with an upright oval to rounded crown; fairly slow grower
- Three-lobed green summer leaves with variable fall color
- Handsome flaky pealing bark
- Once established, more heat, drought, and high pH soil tolerant than most maples
- Useful in USDA zones 6 to 9a
- Recommended in the Texas Panhandle since 1930’s
- Street tree, parking lots, size fits with smaller lots
**Acer truncatum**  
**Shantung Maple**  
- Small to medium, 30’ to 50’ tall, deciduous maple with an upright oval to round headed canopy  
- Clean five-lobed truncate leaves with sometimes good yellow to red fall colors, mostly in cooler regions  
- Asian native useful in USDA z. 6(5b) to 8 where it is moderately heat & drought tolerant  
- Susceptible to foliar salt damage  
- Designated a Texas Superstar® but better in the northern half of the state than in southern half

**Acer saccharum**  
**Sugar Maple**  
- Medium to large, 60’ to 80’ (120’), deciduous tree of the Eastern USA forests, including East Texas (subspecies)  
- Original source of maple syrup, important timber tree  
- Valued for dark green summer and vibrant fall foliage

**Acer saccharum**  
**Sugar Maple**  
- More widely utilized in cooler climates, USDA z. 3b-7b as shade or park tree  
- Prone to problems with compacted soils, root disturbance, and reflected heat  
- A sugar maple leaf is the national symbol of Canada

**Aesculus hippocastanum**  
**European Horsechestnut**  
- Important timber and landscape tree in Europe  
- Reaches 60’ to 70’ in Northeastern and Northwestern USA, USDA zones 5 to 7(8)  
- Valued for late spring creamy white flowers  
- Fruit are not edible  
- Poor performer in our region, prone to powdery mildew, leaf scorch and leaf spot diseases
**Betula nigra**

- **River Birch**
- Medium / large, 40’ - 60’, deciduous tree, z. 4-8 (9)
- Only *Betula spp.* widely adapted to the Deep South
- Pyramidal habit becoming irregular oval, fine textured
- Super exfoliating cinnamon to very light brown bark
- Rapid grower; needs moisture; avoid high pH soils, salty irrigation water, late winter / spring pruning
- Moderately resistant to bronze birch borers

**Betula papyrifera**

- **Paper Birch**
- Has super white bark, but is poorly adapted to the southern USA
- No reliable white-bark birches for the Deep South
- Ecologically important in northern climates

**Carya illinoinensis**

- **Pecan**
- Texas state tree!
- Large 70’ - 80’ (100’) tall deciduous shade or orchard tree; z. 6(5b)-9
  - Excessively large for contemporary urban / suburban lots
  - Better landscape tree for Western half of state
- Very messy landscape tree, drops leaves, catkins, fruit, & limbs
- Long-lived, but prone to numerous foliar & fruit diseases / insect problems; needs deep soils
- Important commercial nut and timber species
- Contact your local extension agent or certified nursery professional to suggest the best cultivars for your region
**Carya ovata**

*Shagbark Hickory*

- A large deciduous tree of Eastern North American forests, USDA zones 5 (4b) – 8 (9a)
- Picturesque shaggy bark in recurved strips
- Long straight bole; wood for tools
- Beautiful golden yellow fall color
- Edible meat in hickory nuts
- Very, very slow grower, coarse taproot hinders transplant
- Preserve *in situ* trees, possibly for wildlife and naturalized plantings

**Juglans nigra**

*Black Walnut*

- Medium to large, 50' to 60' (120') tall, deciduous tree of Eastern North America, including East Texas
- Thick stout trunk and crown when open-grown, long straight bole in competition
- Handsome fissured blocky bark with age
- Produces edible walnuts in fleshy husk

**Juglans nigra**

*Black Walnut*

- Best on deep rich alluvial soils with alkaline to neutral pH, slower grower in shallower or acidic soils; USDA z.4b-9
- Very valuable as veneer wood, walnut rustlers!!!
- Allelopathic (juglone) to some plants, awfully coarse winter texture, premature defoliation due to anthracnose, webworms can be problematic; taprooted

**Juglans regia**

*English Walnut*

- English Walnuts are the classic walnuts of commerce
- Important commercial European nut, shade, and timber tree
- Grown in USDA zones 7 - 9, Carpathian strain to zone 6
- Grown in commercial orchards on the West Coast where cultivars are grafted on *J. regia*, *J. hindsii*, or *J. regia × J. hindsii* seedlings
- Finer textured than *J. nigra*
- Not widely encountered in our region
The Truth Is Out There.....

Fagus grandifolia
American Beech

• An important large, 60’ – 70’ (120’) tall, deciduous climax tree of the eastern North American forests, USDA zones 4 (3) – 9a
• Beautiful smooth light gray bark, dark glossy leaves, nice tan to brown fall colors, edible beech nuts

Some Species Are Prone To Trunk Rots, Is This Bad?

Fagus grandifolia
American Beech

• Chlorosis on high pH soils, intolerant of compaction or poorly drained soils
• Casts a dense shade which hinders turf culture
• Young trees for screening, naturalizing, wildlife, specimen
• Very, very slow grower
• Wildlife: mast, shelter, & browse
• Often a bark vandalism victim
**Fagus sylvatica**
European Beech

- European counterpart to *F. grandifolia*, USDA z. 4 - 8
- Large tree, 50’ to 60’, more in some sites
- Similar landscape attributes as American Beech, but wider of array of cultivars are available
  - Fastigiate, weeping, contorted, cutleaf and bronze foliage cultivars
- Not recommended for widespread use in our region, even less tolerant than *F. grandifolia* to drought and environmental stresses

**Castanea dentata**
American Chestnut

- Chestnut blight (*Cryphonectria parasitica*) = tragic tale of the slaying of the “queen of the eastern forests”
- Prior to blight one of largest trees in the eastern forests, up to 120’ tall with 7’ diameter trunks, hardy in USDA zones 4 - 9
- Now stump and root sprouts in its former range, once one-third of the forest canopy

- It’s loss had huge ecological & economic consequences; intolerant of salt exposure
- Recurrent backcross programs to breed blight resistant trees are in progress!
**Castanea mollissima**
**Chinese Chestnut**
- Introduced medium size, 30’ – 40’ tall, deciduous shade or orchard tree, USDA zones 5 (4b) – 9a
- More apple tree growth habit
- Showy male catkins in spring
- Self-sterile, need two different genotypes for good fruit set
- Intolerant of high pH soils, soil or foliar salts, or root zone disturbance
- Resistant to chestnut blight, but susceptible to oak wilt
- Messy burs in lawns

**Catalpa bignonioides**
**Southern Catalpa**
- Medium/large tree with irregularly spreading crown, USDA z. 5b - 9
- Pleasantly coarse in summer, harsh habit in winter
- Decidedly tropical in appearance, large heart-shaped leaves
- Very tough, any soil that is not extremely wet or dry
- Drought tolerant, but copes by dropping leaves
- Major limitations are *Verticillium* wilt, powdery mildew, & catalpa sphinx
- Plants tend to be messy on manicured lawns
- White 1” - 2” flowers with purple splotches, late spring, pods resemble greenbeans on steroids (but not edible)
**Catalpa speciosa**
Northern Catalpa

- Similar to *Catalpa bignonioides* except;
  - Larger, 50' - 60' tall, with upright oval crown
  - Even coarser textured, but better timber tree / posts
  - Blooms a few weeks earlier than *C. bignonioides*
  - Flowers slightly less effective than *C. bignonioides*
  - More cold hardy, z. 5a (4b) to 9
- Wood of *Catalpa spp.* is hard and durable in contact with soil once cured, but warps badly

**Diospyros virginiana**
Common Persimmon

- Medium / large tree, pyramidal, later upright oval
- Dark glossy green foliage turning varying combinations of yellow, orange, red, or maroon in autumn
- Female trees with interesting edible orange fruit

**Ehretia anacua**
Sandpaper Tree

- A native shrub or tree from South Texas & NE Mexico, USDA zones 8 (7b) to 13
  - Common in Hill Country
- Upright to spreading, 15' to 25' (50') tall
- Semi-evergreen dark glossy scabrous leaves
- Showy star-shaped spring flowers, sporadic fall/winter
- Tough shade tree for South Texas landscapes
**Ehretia anacua**  
**Sandpaper Tree**
- Handsome yellow-orange to red-orange fruit are quickly taken by birds, can be messy & weedy, a la hackberry
- Drought, heat, wind, & some salt tolerance, best in higher pH soils
- Avoid poorly drained sites, but trees are cotton root rot resistant

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**Koelreuteria paniculata**  
**Panicled Goldenraintree**
- Medium, 20' - 30', deciduous tree, hardy USDA z. 5 - 8
  - Typically umbrella-shaped canopy, gangly when young
- Multiple seasons of interest
  - Medium coarse summer foliage, yellow - orange fall color
  - Late spring / early summer yellow flowers
  - Lantern-like seed capsules, green / tan, late summer / fall

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**Koelreuteria bipinnata**  
**Bougainvillea Goldenraintree**  
- Similar to *K. paniculata* except;
  - Less cold hardy, z. 9 when young, older plants z. 8
  - More heat tolerant, requires less winter chilling
  - More irregular upright oval growth form, taller
  - Coarser textured foliage
  - More showy, later summer yellow flowers
  - More attractive tan to pinkish seed capsules
  - Smooth gray bark, less corky
- Best to use *K. bipinnata* in USDA z. 8b and warmer, *K. paniculata* in z. 8a to 5

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**Koelreuteria paniculata**  
**Panicled Goldenraintree**
- Soile adaptable, drought, wind, air pollution tolerant
- More cold hardy, less heat tolerant than *K. bipinnata*
- Needs training in youth, requires 4-5 yr. to flower
**Liquidambar styraciflua**  
American Sweetgum

- Medium / large deciduous native tree, 40' - 60' (120')
  - Dark glossy green leaves turn yellow, orange, red in fall
  - Crown upright oval, long clear bole in competition
  - Native to a variety of upland & bottomland sites

- Needs some moisture, tolerates various soils if not high in pH
  - Variable hardiness by provenance, z. 6(5)-9
    - *L. styraciflua* 'Moraine' is more cold hardy
  - Can become weedy; ball-like woody capsules can be very messy
  - High pH soils result in chlorosis

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**Pistacia chinensis**  
Chinese Pistachio

- Deciduous medium tree, broad spreading crown
- Excellent shade, street, specimen or patio tree
- Disease/pest-free foliage, attractive fruit on female trees, often excellent red/orange/yellow fall color
  - One of most reliable trees for fall color in Texas

- Very adaptable; tolerates heavy clay soils, alkaline soil; takes heat, drought, & salty irrigation water
- Slow to establish; sparse in youth; fruit can be messy; can escape cultivation; useful z. 7 (6b) - 9
**Platanus occidentalis**  
*Sycamore*

- Massive deciduous native forest / shade tree, z. 3 - 9
  - Upright oval to broadly rounded crown
  - Massive trunk, large thick horizontal branches
- Numerous landscape positive features; coarse maple-like leaves, majestic form, white, tan, brown mottled bark, wide site adaptability, beautiful tree

**Unfortunately also numerous landscape liabilities:**
- too large for most urban / suburban sites or street tree plantings, constant litter, leaves, twigs, fruit, number of insect / disease problems (anthracnose, fastidious xylem inhabiting bacteria, lace bug)

**Platanus × acerifolia**  
*London Planetree*

- Very similar in landscape use to *Platanus occidentalis* except;
  - Slightly smaller, but still a very large massive tree
  - Somewhat less cold hardy, to z. 4 - 9
  - Resistant to anthracnose but susceptible to lethal canker stain and sycamore lace bug
  - Bark less attractive than *Platanus occidentalis*, green instead of white under bark
**Platanus × acerifolia**  
**London Planetree**

- Perhaps somewhat more urban tolerant than *Platanus occidentalis*, but ornamentally inferior
- Sometimes pollarded in Europe

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**Populus deltoides**  
**Eastern Cottonwood**

- Large native deciduous tree along stream / river courses
- Irregular upright oval to vase-shaped crown composed of 3 or 4 main branches; very rapid growth rate; does not age well
- Coarse in leaf and winter habit, picturesque in native habitat, best left in large naturalistic planting sites, park areas, 60’ - 80’ tall common, 100’ possible

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**Populus deltoides**  
**Eastern Cottonwood**

- Wind flutters leaves
- Extremely cold hardy, z. 2 – 9 (10)
- Numerous problems, many common to most poplars;
  - Messy (leaves, fruit, twigs), weak wood, invasive roots, debilitating cankers, drop leaves in drought, weediness

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**Populus deltoides**  
**Eastern Cottonwood**

Large surface roots can be problem in turfgrasses
**Populus tremuloides**
*Quaking Aspen*
- Medium to large upright deciduous trees from high elevations or latitudes
- Hardy in USDA z. 2 (1) - 6 (7); intolerant of heat
- Extremely important ecologically & economically in cold temperate North America
- Also native to a few mountain tops in West Texas, but only suited to high elevation landscapes in our region

**Ginkgo biloba**
*Ginkgo*
- Large deciduous broad-leaved conifer, hardy z. 4-8 (9)
- Tendency to gangliness in youth, later becomes attractive and picturesque as trees mature
  - Unique bi-lobed leaves, turn golden yellow in autumn
  - Trunk becomes gnarled and bark corky with age

**Ginkgo biloba**
*Ginkgo*
- Adaptable to most urban sites, but less vigorous in USDA z. 8 & 9 than in cooler climates
- Fruit (nut) on female trees is edible, but coating is malodorous; long juvenility period, so pick male clone
- Supposedly saved from extinction by Buddhist monks

**Taxodiaceae - Taxodium Family**
*A small, but very important, gymnosperm family (sometimes included in Cupressaceae)*
- Also known as Baldcypress or Redwood Family
- 10 to 12 genera containing 15 or so species
- Coniferous needle-like evergreen to deciduous trees or shrubs
- Monoecious, males in deciduous sporangia, females form small 2 to 9 seeded woody cones
- Important genera include Cryptomeria, Cunninghamia, Metasequoia, Sciadopitys, Sequoia, Sequoiadendron, and Taxodium
**Taxodium distichum**

Common Baldcypress

- Deciduous conifer with soft textured needle-like foliage in layers of horizontal branchlets, good bronze fall color
- “Knees” develop from roots on wet sites; USDA z. 5 (4)-10

**Taxodium distichum var. imbricarium**

(syn. *Taxodium ascendens*)

Pond Baldcypress

- Adapted to similar uses & sites as *T. distichum*, but narrower of crown, possessing ascending awl-like needles, and perhaps lesser tendency to develop knees
- Useful USDA z. 5 - 9 (10); tolerates standing water
- Sometimes considered to be a separate species

**Taxodium distichum var. distichum**

Common Baldcypress

- Rapid grower, wind firm, heat tolerant, can grow in standing water or dry site once established (but may defoliate)
- Tendency for chlorosis on high pH soils, may tolerate root zone salts but variable with foliage
- Bagworms, spider mites, Cercospora-like leaf spots

**Taxodium distichum var. mexicanum**

(syn. *Taxodium mucronatum*)

Montezuma Cypress

- Tardily deciduous to evergreen coniferous tree that is now considered a variety of *T. distichum*; useful USDA z. 8 (7) - 13
- Even more rapid growing than *T. distichum*, but less uniform in growth habit; sometimes more blue-green in foliage color
- Sometimes thought to be a separate species
- Tolerates drier more alkaline soils than type
**Metasequoia glyptostroboides**

**Dawn Redwood**

- Very handsome large 70' to 80' tall deciduous conifer closely related to *Taxodium spp.*
- Needles a bit larger and opposite compared to *Taxodium spp.*; native to China
- Feathery dark green foliage, pyramidal form, fluted trunk and russet fall color are assets

- Not tolerant of drought, low relative humidity, salt, nor high pH soil, but is a rapid grower
- Much less urban tolerant than *T. distichum*
- Known only from fossils until late 1940's
- Does not develop knees; peeling bark; USDA z. 5 – 8 (9), best used in NE portion of our region

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**Questions / Comments?**

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