**Trees and Shrubs for Sustainable Built Environments**

**HORT 306 Fall 2018**

**Plant List 3**

**Large & Medium Deciduous Trees II**

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**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:
  - Fagaceae (p. 82), Lauraceae (p. 86), Magnoliaceae (p. 87), Rosaceae (p. 99), Sapindaceae (p. 101) & Ulmaceae (p. 106)
- Descriptions for individual species
  - See page listings on Plant List 3 Handout (also available under lists on course website)

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**Liriodendron tulipifera  Tulip Poplar**

- One of the largest trees, to 200’, in Eastern USA forests, but only 40’ – 60’ in NE Texas
- Grown in mesic parts of USDA zones 4 – 8(9); drought and salinity intolerant
- Requires rich moist acidic well drained soils
- Handsome summer foliage, orangish green tulip-like spring flowers very high in canopy
- Grows very rapidly but slow to flower

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**Liriodendron tulipifera  Tulip Poplar**

- Valued for golden yellow fall color
- Large erect oval crowns in winter landscapes
- Valuable timber
- Bark is a favorite of beavers
- Easily affected by trunk rots if bark is damaged
**Pyrus calleryana**

*Callery Pear*

- Medium deciduous tree, 30’ - 40’ tall
  - Narrow upright oval to broadly teardrop-shaped
  - Dark glossy green leathery foliage, fall color variable from green to yellow, orange, red, or maroon-purple
  - White spring fragrant / malodorous (?) flowers
  - Small pome fruits, brown, inedible, utilized by wildlife
  - Variable heat (z. 7 - 9) and cold tolerance (z. 6a - 4b)
- Adaptable to adverse sites, seasonal poor drainage
- Resistant to many diseases / pests of *Pyrus spp.* except fireblight
- Many clones have poor branching structure

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**Pyrus calleryana ‘Bradford’**

*Bradford Callery Pear*

- *P. calleryana* cultivar with teardrop shape, extremely uniform and favorite of designers, excessively formal
- High chilling requirement & tendency for summer dormancy often ruin flower effect in central/south TX
- Extremely poor branching structure, long-term liability
- Other cultivars have been selected, supposedly with better branching structure, time will tell

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**Pyrus communis**

*Common Pear*

- Medium, 20’ - 30’, deciduous tree, hardy in USDA z. 5(4)-9
- Source of commercial pears, important fruit tree
- Clones vary tremendously in adaptability to Texas regions
- Susceptible to fireblight
- Messy in manicured lawns

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**What’s wrong with this tree?**

**Scion** -- **Rootstock**
**Quercus spp. Oaks**

- Huge economic, ecological, and historical implications
- Red/black oaks vs. white oaks
- Oak wilt (*Ceratocystis fagacearum*) and sudden oak death (*Phytophthora ramorum*)
- Very promiscuous taxa

**Quercus acutissima Sawtooth Oak**

- A medium size, 35’ to 45’ (60’) tall, introduced deciduous Asian oak useful in USDA zones 6 (5b) – 9a
- Dark glossy green chestnut-like leaves, upright oval to pyramidal in youth, broader with age
- Plants tend to hold the tan brown leaves into winter, particularly when young, and can function as a screen

**Quercus acutissima Sawtooth Oak**

- Easily transplanted, drought and heat tolerant
- Mast species for wildlife
- Needs training when young, prone to chlorosis on neutral to high pH soils
- ‘Gobbler’ is a seed propagated line with rapid growth, good cold tolerance, & profuse acorn production from S.C.S.

**Quercus emoryi Water Oak**

- Large (50’ - 70+’) deciduous shade tree, hardy z. 6 – 10a
  - Pyramidal in youth
  - Round crown with age
- Bottomland species adaptable to upland sites
  - Tolerates clay soils and periodic flooding, rapid grower
  - Prone to chlorosis on high pH soils; mast species
- One of most widely used, but least desirable oaks
  - Subject to heart rots, powdery mildew, weak wooded
  - Leaves difficult to rake
  - Requires lots of “limbing-up”
  - Dense shade & surface roots hinder turf culture
**Quercus phellos**
Willow Oak

- Large (60’-80+) deciduous shade tree, hardy in USDA zones 5b – 9; can be a liability with age
  - Needs some moisture, even more prone to chlorosis on high pH soils than *Q. nigra*
  - Readily transplanted, rapid growth rate
- Attractive pyramidal form in youth, rounded form with age
  - Constant “limbing up” for clearance
  - Pruning requirements & size limit use as street tree
- Fine textured willow-like leaves, difficult to rake
- Similar uses as *Q. nigra*, but less objectionable in East Texas, more objectionable westward

**Southern Red Oak**
*Quercus falcata*

- A large deciduous bottomland tree of the Southern U.S., adapted to USDA zones 6a-9
- Dark lustrous olive green leaves, muted orange-red to red fall color

**Quercus falcata**
Southern Red Oak

- Heat tolerant, can withstand occasional poor drainage
- Intolerant of high pH soils and not overly drought tolerant, susceptible to oak wilt
- *Quercus falcata* var. *pagodifolia* (Cherrybark Oak) is a highly desirable bottomland timber tree; differs in bark and leaf shape

**Quercus macrocarpa**
Bur Oak

- Large (60’- 80’) deciduous shade tree, cold hardy to USDA z. 3 & tolerates heat of z. 9
  - Stout trunk divided into several large branches forming bulk of oval to rounded crown
  - Huge acorns
  - Pleasantly coarse textured, medium growth rate
  - Very wind firm
**Quercus macrocarpa**  
**Bur Oak**
- Very widely distributed native oak, well adapted to both warm and cold regions, variety of soils
  - Drought and limestone soil tolerant
- May be too large for residential use; excellent park / street tree where sans overhead utility lines
- Asset with age, needs a little TLC at transplant

**Quercus muehlenbergii**  
**Chinkapin Oak**
- Increasingly popular medium to large deciduous tree; needs good drainage
- Valued for its attractive disease-free foliage, pleasing growth form, and adaptability to a range of sites
- Can tolerate high pH soils and drought with correct provenance selection, moderate growth rate, useful in USDA zones 5-9

**Quercus polymorpha**  
**Monterrey Oak**
- Medium size, 35’ to 45’ (60’), upright oval crowned evergreen/semi-evergreen oak
- Highly variably lobed thick leathery dark green to blue-green leaves; from Mexico
- Only recently entering the mainstream trade; useful in USDA z. 8 (7?) - 11
- Appears adaptable to a range of conditions, including heat & drought
- Tolerates higher relative humidity than many xeric climate oaks making it useful further into SE USA, increasingly popular

**Quercus shumardii**  
**Shumard Oak**
- Large (50’-60’) deciduous shade tree, oval to rounded
- With proper provenance selection can be used on higher pH soils, adapted to USDA z. 4 – 9a, Texas native
- Attractive “Red Oak” shaped-leaves, good red fall color with some genotypes in right environments
**Quercus shumardii**
*Shumard Oak*
- Some tolerance to soil salts, but intolerant of foliar salts and poor drainage
- Probably the best of red oak group for widespread use in Texas; important mast species for wildlife
- Provenance selection is critical for sustainable use

**Quercus buckleyi**
*Texas Red Oak*
- Formerly *Quercus texana*, used in zones 6 to 9a (9b)
- A medium to large, 30’ to 50’ (70’), deciduous tree very closely related to *Q. shumardii*
- Somewhat smaller of leaf and plant size and more drought and high pH soil tolerant than *Q. shumardii*
- Lustrous dark green summer foliage, red-orange to bronze-red fall color is possible
- Avoid poorly drained sites, susceptible to oak wilt

**Quercus rubra**
*Northern Red Oak*
- Northern counterpart to *Q. falcata*
- A large deciduous forest and landscape tree from the Eastern U.S., popular in USDA zones 3 – 8a
- Long straight boles on forest trees, spreading upright oval crowns when open grown
- Poor performer in droughty alkaline soils and hot summers, only useful in NE portion of our region

**Quercus palustris**
*Pin Oak*
- Important landscape/forest tree of East/Central USA
- Maybe most widely planted landscape oak in USA, easy to transplant, handsome habit, occasional red fall color, pyramidal form, USDA z. 5 (4b) – 8
- Constant pruning of lower limbs, drooping and swooping / chlorosis limits Texas use
**Quercus stellata**  
*Post Oak*

- Medium / large (40’ - 60’) deciduous shade tree
  - Best substitute for White Oak (*Q. alba*) in much of Texas
- Dominant tree in post oak savannah region
  - Important native landscape tree in Central Texas
  - USDA z. 5-9, of minor importance outside Texas/Oklahoma
  - Very slow grower; essentially old growth forests

**Quercus alba versus Quercus stellata**

**Quercus alba**  
*White Oak*

- Large important landscape / timber / mast tree of eastern USA, East Texas native, useful on mesic sites with acidic soils in USDA z. 4 (3) – 8 (9a)
- Beautiful form, foliage, fall color, but needs moist acidic soils, has extensive taproot system, and is extremely sensitive to root disturbance / compaction
**Quercus laceyi**
Lacey Oak

- Picturesque handsome small to medium tree
- Blue-gray foliage, new growth pink
- USDA zones 7(6b)-9b
- Heat, drought, alkaline soil tolerant
- High humidity and heavy soils are a problem in Southeast Texas, best I-35 west

**Sapindus drummondii**
Western Soapberry

- Medium, 30’ - 40’, deciduous tree native to western USA, with upright oval crown, useful in USDA z. 6 (5b) - 9
- Creamy white late spring/early summer flowers
- Yellow fruit in late summer/fall on female trees, *poisonous*, asset in summer/fall, liability by late winter, can be weedy

**Sapindus drummondii**
Western Soapberry

- Clean summer foliage, often a good yellow fall color
- Any moderately well-drained soil, tolerates heat, cold, drought, salt, high pH soils, very durable
- Probably under-utilized in Texas landscapes
- New borer might be a brewing problem

**Sassafras albidum**
Sassafras

- A medium to large, 30’ to 60’ tall, deciduous tree of Eastern North America, including East Texas
- Handsome aromatic summer foliage is followed by yellow, orange, and / or red fall color
- Blue-black fruit and pink-red pedicels are mildly showy
**Sassafras albidum**

**Sassafras**

- Sympodial branch structure and corky bark are interesting
- A pioneer species that is site responsive, may develop chlorosis on high pH soils, has suckering tendencies
- Intolerant of foliar salt exposure, but heat and cold tolerant
- Naturalizing, shade tree, bank or slope stabilization

**Ulmus alata**

**Winged Elm**

- Medium deciduous native shade tree
- Variable in height, 30’ to 60’ depending on location and genotype, USDA z. 6 – 9 (10a)
  - Irregularly vase-shaped to oval crown
- Durable adaptable species, rapid grower
- Numerous elm diseases, powdery mildew and Dutch elm disease are most troublesome
  - Perhaps more DED resistant than *U. americana*, but still susceptible
  - Inferior tree to *U. crassifolia*, less refined, weedy

**Ulmus americana**

**American Elm**

- Large 60’ - 80’+ deciduous native tree, zones 3 to 9 (10a)
  - Famous for cathedral lined streets of vase-shaped trees
  - Also upright oval to broad spreading oak-like forms
  - Very urban tolerant

**Ulmus plagued with Diseases / Pests / Liabilities but still beloved**

- Bacterial blight
- Slime flux
- Elm leaf beetle
- Weak wood
- Splitting

- DED

- Probably more DED resistant than *U. americana*, but still susceptible
  - Inferior tree to *U. crassifolia*, less refined, weedy
**Ulmus americana**

**American Elm**

- Steeped in American folk lore, victim of DED
  - Despite architecturally unmatched vase-shaped habit, they are subject to numerous insect and disease pests
  - DED, phloem necrosis, wet wood, bark beetles, cotton root rot, and elm leaf beetle to name the serious ones
- Very adaptable, former favorite for difficult urban sites
- Breeding for disease resistance progresses, DED resistant clones are available, but vary in chilling requirements

**Ulmus crassifolia**

**Cedar Elm**

- Medium to large deciduous shade tree
- Typical rounded to oval form, sometimes vase-shaped, zones 6 to 9 (10a)
- One of best elms for regional landscapes
  - Good outline, refined growth habits
  - Good resistance to most elm diseases
    - Moderately resistant to DED and cotton root rot, but poor branch angles in youth
    - Moderately susceptible to powdery mildew, especially in high humidity; elm leaf beetle
  - Fairly site adaptable, good urban tolerance
- Underutilized; some splitting in high winds

**Ulmus parvifolia**

**Lacebark Elm**

- Semi-evergreen to deciduous medium (30’ - 50’) tree, use temperate to tropics
  - Variable cold tolerance (cold as z. 5b to only surviving z. 8 winters), semi-evergreen types are less cold hardy
  - Fine textured dark glossy green foliage
  - Sometimes develops a good red to red-purple fall color
- Fairly disease/pest resistant, susceptible to mistletoe, cotton root rot, and elm leaf spot, DED resistant
- Unfortunately confused with inferior *U. pumila*
- Can be very weedy & is starting to escape cultivation
- Prone to ice damage

**Ulmus parvifolia**

**Lacebark Elm**

- Outstanding to interesting bark, highly variable
  - Smooth gray plating tan / brown to mottled flaky brown bark
- Fairly disease/pest resistant, susceptible to mistletoe, cotton root rot, and elm leaf spot, DED resistant
- Unfortunately confused with inferior *U. pumila*
- Can be very weedy & is starting to escape cultivation
- Prone to ice damage
Questions / Comments?

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Can a plant be too well adapted?

Ulmus parvifolia
Lacebark Elm

• Medium (50' - 60') vase-shaped deciduous tree
• When open grown has a short stout trunk, numerous upward arching branches
• Highly resistant to DED, possible U. americana substitute, used widely in Upper South / Midwest
• Adaptability to Texas somewhat variable, needs irrigation, USDA z. 6 (6g) – 8(9a)

Zelkova serrata
Japanese Zelkova

• Medium (50' - 60') vase-shaped deciduous tree
• When open grown has a short stout trunk, numerous upward arching branches
• Highly resistant to DED, possible U. americana substitute, used widely in Upper South / Midwest
• Adaptability to Texas somewhat variable, needs irrigation, USDA z. 6 (6g) – 8(9a)