Why Do These Trees Not Have The Same Growth Habit?

How do large evergreen trees function compared with large deciduous trees?

- Similar function as main backbone / framework and permanence as deciduous counterparts
- Many are ancient evolutionarily
- Serve even greater roles in screening and wind breaks
- Huge role in wildlife habitat and food chains and ecological systems
- Extremely important to cold climate winter designs
- Many are commercially important for forestry, indigenous medicinal, maritime (past), holiday products
- Significant implications for effects of pruning and insect/disease damage – reserves in foliage

Reading Assignments

In *Landscape Plants For Texas And Environs, Third Ed.*

- Intro materials on shrubs (p. 682, 807)
- Family descriptions for:
  - Araucariaceae (p. 69), Cupressaceae (p. 78), Fagaceae (p. 82), Lauraceae (p. 86), Magnoliaceae (p. 87), Myrtaceae (p. 91), Pinaceae (p. 94), Taxodiaceae (p. 104)
- Descriptions for individual species
  See page listings on Plant List 6 Handout
  (also available under lists on course website)
**Araucaria spp. Araucaria**
- Genus of evergreen gymnosperms from South America equivalent to our pines
- Mostly tropical / subtropical, few warm temperate species hardy to protected locations in USDA z. 7
- Most commonly grown species are *A. araucana*, *A. bidwillii*, *A. heterophylla*, and *A. columnaris*

**Eucalyptus spp. Eucalyptus**
- 100's of species of trees/shrubs, most native to Australia, some naturalized (invasive?) in California and Florida
- Often confined by cold (at best zone 8, mostly z. 9 - 13) to use as suckering shrubs or herbaceous perennials in SE USA, but a few species can become large trees

**Araucaria spp. Araucaria**
- Mostly medium to large trees with conical to upright rounded crowns
  - Several over 100' at maturity in native lands, usually smaller here
  - Some with very large globose cones
- Full sun, well drained acidic soils are best, but some tolerate salt and drought well
- Important timber trees in native lands, bold ornamentals, sometimes in interiorscapes

**Eucalyptus spp. Eucalyptus**
- Valued by florists for their aromatic blue-green to silver-gray foliage, popular in cut arrangements
- Adapted to many sites, heat & drought tolerant
- Avoid alkaline or poorly drained soil, problems with *Phytophthora* infested soils
- Tend to be messy trees & bigger than anticipated
Size & Placement Are Critical

Imagine planted three feet off the corner beside your house

Melaleuca spp. Honey Myrtles
- Vigorous (sometimes invasive?) Australian genus of shrubs and medium size trees
- Most are tropical or subtropical (z. 9-13), maximum of USDA z. 8, evergreens
- Soft textured foliage and white bottle-brush-like spikes of fragrant flowers
- Many species have handsome peeling bark
- Many species are tolerant of drought, salt, and period flooding
- Melaleuca quinquenervia, Cajeput Tree or Paperbark Tree, is a federally prohibited species rarely seen along the Texas Gulf Coast; very invasive in Florida everglades

Magnolia grandiflora Southern Magnolia
- Medium/large broad-leaved southern evergreen trees
  - Pyramidal in youth, oval - rounded crown with age
  - Smaller in Central Texas than rest of SE USA
  - Hardy from z. 6b, marginal in 6a, to 9 (10)
- Large 6”-12” diameter white flowers, fragrant, legendary
  - Peak in late spring, sporadically to frost
- Best left limbed to ground as dropping leaves, fruit, & flowers are messy, requires steadily available moisture
- Trademark / signature plant of southern landscapes
**Magnolia virginiana**
Sweetbay Magnolia

- Semi-evergreen
- Small to large trees, hardy in z. 5b(5a) - 9

**Quercus virginiana**
Live Oak

- Medium/large (40'-60') evergreen shade tree, z. 7b–13
  - Picturesque spreading crown, thick trunk, drooping limbs
  - Larger south & east, hybridizes with *Q. fusiformis* in west

**Magnolia virginiana**
Sweetbay Magnolia

- Open picturesque variable habit, creamy white flowers late spring to frost, very fragrant
- Prone to chlorosis on very high pH soils, needs some steady moisture

**Quercus virginiana**
Live Oak

- A premier oak for widespread use in Texas
  - Extremely site adaptable, drought, heat, seasonal poor drainage, salt, and wind tolerant; a signature plant for the SE USA
  - One of most urban tolerant oaks available
**Quercus virginiana**
Live Oak

- Oak wilt is lethal, a major limitation in some areas
  - Similar effect as Dutch elm disease on elms, more readily spread when planted as a monoculture, a good argument for species diversity

**What’s wrong with this Live Oak?**
= Hurricane Rita survivor

**Q. virginiana / Q. fusiflormis**
Hybrid Swarm

- Opposite sides of the same road in Brazos County, Texas

**Quercus fusiformis**
Escarment Live Oak

- Very similar to Q. virginiana (Live Oak), except:
  - Shorter (30’ - 40”), more drought, limestone soil, and cold tolerant, often found in clonal mottes
  - Cold hardy to z. 7a (6b) - 13, better adapted to North & West Texas than Q. virginiana
**Quercus suber**  
*Cork Oak*  
- A medium size, 30’ to 50’, evergreen tree useful in USDA zones 8 - 13  
- Initially strongly upright, becoming spreading and rounded with time  
- Tolerant of heat and drought, withstands some soil salts and some alkalinity  
- Very handsome bark  
- Needs well drained soils, may have problems with excess rainfall / high RH  
- Source of commercial cork

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**Cinnamomum camphora**  
*Camphor Tree*  
- A medium to large evergreen Asian tree, in USDA zones 9b (9a) - 13, or dieback shrub in zones 8 - 9a  
- Typically a spreading Live Oak-like growth habit, 30’ to 40’ (50’) tall in our region  
- Vibrant green aromatic foliage  
- Cold sensitive and not for very high pH or poorly drained soils, but wind firm, heat and some drought tolerance  
- Source of commercial camphor  
- Shade, street, specimen, or park tree  
- Can be weedy, dense canopy hinders turf culture

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**So Where Would You Look For Shelter?**
**Pinaceae**  Pine Family
Probably the most important gymnosperm family in the world
- 9 or 10 genera containing 200 to 210 species
- Primary source of softwood timber, naval stores, and Christmas trees
- Invaluable ecologically and for ornament
- Males in small deciduous cones, females in spirals of woody scales subtended by the seeds resulting in a persistent cone
- Important genera include *Abies*, *Cedrus*, *Picea*, *Pinus*, *Pseudotsuga* and *Tsuga*

**Abies spp.**  Firs
- Important conical-shaped coniferous evergreen trees native to mostly high elevation cool to cold temperate regions
- Useful in USDA zones 3 - 6 (7a) which lack hot summers
- Nearly all are heat intolerant, variable in drought and soil tolerances
- Very popular as Christmas trees

**Abies spp.**  Firs
- Only *Abies concolor*, White Fir (a Rocky Mountain native), and *Abies firma*, Japanese Fir, have any potential for the coolest portions of our region
- *Abies concolor* and *Abies fraseri*, Fraser Fir, are considered premium species for use as cut Christmas trees

**Picea pungens**  Colorado Spruce
- Native to wide range in Western USA mountains
- Species is conical tree with dense evergreen needles
- Not well adapted to most of Texas, but sometimes planted in the Texas Panhandle / High Plains
- Best in z. 2-6, suffers in heat of z. 7 & warmer
- Popular northern plant, & should remain there
**Picea pungens f. glauca**
Blue Colorado Spruce
- Needles blue-green to silver-blue
- Most commonly encountered taxa in the trade

**Norway Spruce**
- European native that is second only to *P. pungens* in adaptivity among *Picea* to the Eastern USA
- Widely grown in the Midwest and Northeastern USA & into Canada
- Useful in USDA z. 3 to 7a (7b) where it has naturalized
- Potentially a large, 100’+, broadly pyramidal evergreen, smaller in the northern portions of our region
- Similar culture as *P. pungens*
- Picturesque European timber tree

**Pseudotsuga menziesii var. glauca** is native to West Texas mountains, mostly 20’ - 30’ in Texas; bluish green foliage
- Suffers in heat of z. 7, conical form, green to blue-green foliage, best on moist well drained acid to neutral soils in z. 4 - 6 with cool summers
- Popular Christmas tree

**Cedrus deodara**
Deodar Cedar
- Evergreen, 40’ - 50’ tall, blue-green needles
- Pyramidal in youth, broader, spreading, flat-topped and more picturesque with age
- Finicky as to site requirements, tends to suffer dieback from drought, cold, borers
**Cedrus deodara**  
Deodar Cedar  
- Narrow band of adaptability, suffers in heat of z. 9, but cold damaged in z. 7a  
- Intolerant of poorly drained soils  
- Limitedly effective from North, East & Central Texas to Carolinas

**Pinus taeda**  
Loblolly Pine  
- Large, 50’ - 70’ (120’), needled evergreen  
  - Pyramidal in youth, irregular upright oval with age  
  - Long straight bole in competition  
  - Dwarf forms known, but not common  
  - Prone to ice, snow, & wind damage

**Pinus taeda**  
Loblolly Pine  
- Important widely distributed timber / landscape species, useful in USDA z. 6a to 10 with proper provenance; very adaptable  
  - Widely hybridized with several other “southern yellow pine” species  
  - Major component of pine breeding programs in the Southern U.S.  
  - Tends to yellow in z. 6 & 7 winters without proper genotype selection  
  - Often intolerant of poor drainage  
- Develops chlorosis on high pH soils

**Pinus elliottii**  
Slash Pine  
- Important timber / landscape / wildlife species  
  - Somewhat coarse and rank grower  
- Best adapted “Southern Yellow Pine” for Central Texas, adapted to USDA z. 8 (7b) - 10  
  - Prefers acidic well drained sites, but takes high pH & seasonal poor drainage better than most southern U.S. pines  
- Fusiform rust, pine tip moths, and southern pine bark beetles are significant problems
**Pinus eldarica**
Afghan Pine

- Pyramidal needed evergreen tree, 35’-45’ (60’)
- Christmas tree-like conical growth form in youth, more sculpted and picturesque later in life
- Fine-textured wiry look
- Cold hardy to USDA z. 6, tolerant of z. 9 heat

**Pinus eldarica**
Afghan Pine

- Good drought, heat, salt, and high pH soil tolerance, but intolerant of poor drainage
  - One of few pines to provide soft Eastern White Pine look in Central & West Texas, widely adaptable
- Diplodia blight and tip moth can be problems

**Pinus strobus**
Eastern White Pine

- Large (60’-70’) popular timber / landscape pine
  - Premier pine in NE USA, but intolerant of high pH soils & salinity, reserve for use in NE Texas
  - Cold hardy to z. 3, not as vigorous in USDA z. 8 or warmer

**Pinus strobus**
Eastern White Pine

- Fine textured tree, tiered branching
- Pyramidal in youth, flat-top picturesque with age

Historical importance extends prior to the revolutionary war

Girdling root
**Pinus thunbergii**  
*(Pinus thunbergiana)*  
**Japanese Black Pine**

- Medium size needled evergreen tree, 20’ - 40’
- Variable species, irregular oval crown
- Tufted dark green needles; shoot tip moths
- Picturesque growth habit, frequently used in oriental style gardens, hardy to z. 6 to 9a (9b)
- Fair heat, drought, salt, & high pH soil tolerance, but needs good drainage

**Pinus nigra**  
**Austrian Pine**

- Medium / large (40’ - 60’) formal pine
  - Can be a bit stiff and inflexible in appearance
- Cold hardy to z. 5, performs poorly in z. 8+
  - Best for Midwest, NE USA, Plains, TX/OK panhandle

**Pinus nigra**  
**Austrian Pine**

- Alkaline soil tolerant, but requires good drainage
- Has problems with needle and tip blights (mostly Diplodia)

**Pinus cembroides**  
**Pinyon Pine**

- Group of taxa, small to medium trees, 20’ - 30’, with 1 to 4 evergreen needle-like leaves
  - Sometimes separated into 5 species, P. cembroides, P. remota, P. edulis, P. monophylla, P. quadrifolia
- Dense tear-drop-shaped trees, slow growers
- Need good drainage; heat, cold, drought, and limestone soil tolerant; useful USDA z. 5 - 9
- Dark green to blue-green foliage, important for wildlife cover and food, edible seeds
**Cupressaceae**  Cypress Family

- A temperate to tropical gymnosperm family
- 15 to 21 genera containing 400 to 125 species
- Mostly trees, some shrubs, often resinous, coniferous, and evergreen
- Scale-like to awl-like leaves are often aromatic

**Important Genera Include:**
- *Calocedrus*
- *Chamaecyparis*
- *Cupressus*
- *Juniperus*
- *Platycladus*
- *Thuja*
- *X Cupressocyparis leylandii*  
  - Intergeneric hybrid between the American species *Cupressus macrocarpa* and *Chamaecyparis nootkatensis* in England
- Rapid growing narrow upright columnar evergreen tree, mistaken for a shrub
- Variable foliage colors from medium to dark green or blue-green, scale-like leaves
- Best as a very large screen or tall hedge
- May attain a much greater size than anticipated by lay persons, 40' to 50' (70')
- Hardy in USDA z. 6b (6a) to 10
- Frequently inappropriately placed in designs

**Cupressus arizonica**  
Arizona Cypress

- Medium / large evergreen tree
- Attractive green to blue-green foliage
- Interesting shreddy red-brown bark
- Tolerant of hot, dry sites with alkaline soils, hardy in USDA zones 7 (6b) - 13
- Avoid poorly drained sites, susceptible to borers and spider mites
- Trunk cankers have been reported

**Cupressus sempervirens**  
Italian Cypress

- Classic spire-like silhouette, 30' to 40' tall
- Favorite for formal Mediterranean landscapes
- Alternative to Lombardy Poplar for SW USA
- Grows in most of our region, better adapted to drier portions of USDA zones 8 (7b) to 13
- Avoid poorly drained soils and high RH
- Juniper blight, spider mites, trunk cankers and root rots can be problems

**X Cupressocyparis leylandii**  
Leyland Cypress

- Intergeneric hybrid between the American species *Cupressus macrocarpa* and *Chamaecyparis nootkatensis* in England
- Rapid growing narrow upright columnar evergreen tree, mistaken for a shrub
- Variable foliage colors from medium to dark green or blue-green, scale-like leaves
- Best as a very large screen or tall hedge
- May attain a much greater size than anticipated by lay persons, 40' to 50' (70')
- Hardy in USDA z. 6b (6a) to 10
- Frequently inappropriately placed in designs
**X Cupressocyparis leylandii**

*Leyland Cypress*
- Susceptible to windthrow
- Damage from snow and ice loads can be problematic
- Prone to twig / stem blights, serious trunk cankers, bagworms
- Frequently overgrows sites
- Banned from being planted in some regions of England

**Juniperus virginiana**

*Eastern Redcedar*
- Needle or scale-like evergreen foliage, variable size and form, 4’ - 50’ tall
  - Dwarf spreading mounds to medium size trees
  - Green to blue-green foliage, habit is picturesque with age; interesting bark/trunk
  - Some female clones produce attractive gray-blue cones; tiny brown pollen cones
  - Useful USDA zones 3 – 9 (10)

**Juniperus ashei**

*Ash Juniper*
- Counterpart to *J. virginiana* in Hill Country and parts of West Texas
- Small evergreen tree, 15’ to 20’ (25’)
- Important for wildlife; Golden Cheek Warbler nesting sites
- Useful for similar purposes as *J. virginiana*, but on drier sites
- Needs well drained soils; drought and heat tolerant; hardy z. 7 (6) – 9
- Ecological controversy; Pollen @
**Juniperus scopulorum**  
Rocky Mountain Juniper

- Essentially a western counterpart to *J. virginiana*; intergrades in North Texas
- Native to high elevations of Texas Panhandle, Guadalupe Mountains, and Arizona
- Often narrower crowned and of smaller, 30' to 40', stature than *J. virginiana*
- Tolerates less heat [z. 3-7 (8)] and humidity than *J. virginiana*, but otherwise culture is similar with good drought resistance
- Narrow cultivars, such as ‘Skyrocket’ are popular in the trade

**Cryptomeria japonica**  
Japanese Cryptomeria

- Large 40' to 60' pyramidal to conical coniferous evergreen tree; USDA z.6-8(9)
- Handsome dark green to blue-green awl-shaped needles on tufted branches
- Shreddy red-brown to gray bark, pealing in strips sheets

**Cryptomeria japonica**  
Japanese Cryptomeria

- Most effective in groves or groupings
- Sometimes used as large screen
- Important timber tree in Japan where it can grow to 150' tall
- Prone to leaf blights in high relative humidity, spider mites & scales in hot summers
- Slow growing; avoid poorly drained heavy clays
- Best on acid soils; shield from cold dry winter winds; lots of old foliage in interior

**Sequoia sempervirens**  
Coast Redwood

- The world's tallest trees, 350'+, native to CA & OR coastal mountains; a national treasure
- Rapid growing, long lived, fire resistant trees
- An important timber and ecological resource
**Sequoia sempervirens**

Coast Redwood

- Cathedrals to the gods of nature?
- Frequently planted on West Coast and in England; USDA z. 7 - 10
- Less well adapted to the eastern U.S. than *S. giganteum*; intolerant of dry atmospheric conditions

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**Sequoiadendron giganteum**

Giant Sequoia

- Even more massive than, if not quite as tall as (325'), *S. sempervirens*; to walk among them is a humbling experience
- Leaves are more juniper-like, awl-shaped
- Among largest living organisms on earth

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**Sequoiadendron giganteum**

Giant Sequoia

- More potential for planting outside their native range than *S. sempervirens*
- More cold hardy (z. 6 to 10) and drought tolerant than *S. sempervirens*, but less tolerant of poorly drained soils; avoid hot summers

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**Questions / Comments?**

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