Plants for Sustainable Landscapes
Plants for Landscape Design II
HORT 308 / 609 Spring 2020
Regional Considerations

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Reading Assignments

Pages 54 - 57
Plus Corresponding Color Plates in
Landscape Plants For
Texas And Environs, Third Edition
Texas Regional Conditions

- **Winter temperatures**
  - Subtropical in Rio Grande Valley to cool/cold temperate (USDA zone 6) in Panhandle, most of population in z. 7 - 9

- **Summer temperatures**
  - HOT, HOT, and HOTTER
  - Extreme daily highs & little cooling at night
  - Wide fluctuations in higher West Texas elevations

http://planthardiness.ars.usda.gov/PHZMWeb/Maps.aspx
Texas Regional Conditions

- Precipitation
  - Yearly averages in Texas range from 60 in./yr. in Beaumont to 8 in./yr. in El Paso areas
  - Averages do not reflect distribution through the year

Examples:
College Station average is @38 in./yr.,
- But received over 16” in two days in fall 1995
- 73 consecutive days without rain in summer 1993
- Only 8” from December 1995 through July 1996
- Over 50” of rain from January to August in 2007
- 2008 to 2013 B/CS/Houston officially country’s most anomalous climate region
Severe extended floods in El Paso, summer 2006
Texas Regional Conditions

Natural Climatic Zones, Soils, & Vegetation Types

- Extremely variable soils
- Transition zone from mesic to xeric (E to W)
- Nearly tropical to cool/cold temperate (S to N)
- Temperate mixed conifer/hardwood forests, savannahs, grasslands, scrub, to desert (E to W)
## Variation in Texas Weather

<table>
<thead>
<tr>
<th></th>
<th>First / Low</th>
<th>Last / High</th>
</tr>
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<tbody>
<tr>
<td>USDA hardiness zone</td>
<td>6a</td>
<td>9b / 10a</td>
</tr>
<tr>
<td>Number 32 F days</td>
<td>&lt; 10</td>
<td>&gt; 125</td>
</tr>
<tr>
<td>Date 1st frost</td>
<td>Oct. 1</td>
<td>Dec. 7 or later</td>
</tr>
<tr>
<td>Date last frost</td>
<td>Feb. 15</td>
<td>Apr. 15</td>
</tr>
<tr>
<td>Days &gt; 90 F</td>
<td>&lt; 40</td>
<td>&gt; 180</td>
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<tr>
<td>Precipitation (in./yr.)</td>
<td>&lt; 8</td>
<td>&gt; 60</td>
</tr>
<tr>
<td>Pan evaporation over</td>
<td>&lt; 0</td>
<td>&gt; 68</td>
</tr>
<tr>
<td>precipitation (in./yr.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RH at noon in July (%)</td>
<td>&lt; 40</td>
<td>&gt; 70</td>
</tr>
<tr>
<td>Max. 100 yr. wind</td>
<td>&lt; 70</td>
<td>&gt; 110</td>
</tr>
<tr>
<td>(miles/hr.)</td>
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</tbody>
</table>
Texas Regions

East Texas (Piney Woods)

- Southwest tip of pine/hardwood forest of SE USA
- Gently rolling to slightly hilly
- Mostly acidic well drained soils
- Sands, sandy-loams, clay-loams, to clay soils
- Hot summers, range of winter temperatures
Northeast Texas & Midwest/NE U.S.

This region includes several Texas cities including Texarkana, Paris, Mount Pleasant, Gilmer, portions northeastern Metroplex, and many major cities in the Midwest and Northeastern U.S.

Transition area overlapping in north with boreal species, in the west with Plains plants, in south with Southeastern U.S. flora and to the southwest with Central Texas flora.
Painting With A Broader Brush, USA Regions: Midwest

- Cold winters, hot humid summers
- Variable soil pH, but generally fertile and arable
- Extended droughts rare in east, increasing in frequency in the west
- Precipitation is fairly uniform through the year
- Originally predominantly prairies, with eastern portions part of the savanna and deciduous forest
  - Prairies now invaded by trees/shrubs
- Cold is primary limiting factor to woody plant growth
• Cold winters, summer hot to mild
• Soils predominantly acidic
• Rainfall generally uniform and extended droughts are rare
• Elevation and maritime influences are important in local climate
• Cold is the predominantly limiting factor to landscape plant utilization
• Deciduous to mixed deciduous/coniferous forests
Texas Regions

- Flat, poorly drained, tends to be swampy
- Moderate rainfall, fairly even distribution
- Prairie plants now invaded by trees
- Heavy gumbo clays
- Mild winters, steamy summers
- Significant maritime influences
- Near sea level
Southeast Texas and Southern U.S.

Several Texas cities including Madisonville, Huntsville, Crockett, Nacogdoches, Tyler, Longview, Lufkin, northern parts of Houston and Beaumont, etc.

Transition area overlapping in northwest with Southern Plains plants, in north with Midwest flora and in the Northeast with New England flora, and to the south with the subtropical gulf coast plants.
Painting With A Broader Brush, USA Regions: Southeastern US

- Long hot humid summers except mountains, winters variable from mild to cold
- Rainfall rather uniform and extended droughts are unusual
- Soils are predominantly acidic (signature red clays), with some higher pH soils in the uplands
- Site and soil drainage is variable, but often acceptable
- Elevation and terrain varies from mountainous to sea level
  - Piedmont has rolling hills, coastal plain is flatter
- Heat and cold can limit landscape plant selection
Texas Regions

- Drainage mix of fair to poor
  - Problems with internal and surface drainage
- Gently rolling to slightly hilly
- Mix of slightly acidic sands to slightly alkaline black or gray clays
  - Soil pH often higher when irrigated with alkaline water
- Rainfall (E - W) & low temperatures (S - N) vary greatly
Texas Regions

- Calcareous soils (alkaline)
- Mostly heavy clays, drainage variable
- Moderate rainfall
- Frequent summer drought
- Hot summers, range of winter lows

Blacklands
Central and North Central Texas

Many important Texas cities including Austin, Bryan / College Station, San Antonio, San Marcos, Dallas / Fort Worth, Round Rock, Waco, etc.

Transition area overlapping in north with Southern Plains / Prairie plants, in east with Southeastern U.S. flora, in South with Coastal Plains plants, and in the west with Southwestern U.S. flora.

Painting With A Broader Brush, USA Regions: Central Plains

- Rich agricultural lands
  - Soils deep & fertile, mostly well drained, acidic to alkaline
- Rainfall decreasing from east to west
  - Summer droughts common, hot summers, cold to mild winters
- Native vegetation, tall and short grass prairies with savannah and cross timber in southeast
- Elevation generally increasing to north and west
- Cold, heat, and drought often limiting to plants
Southwestern Flavor
Texas Regions

West Texas

- Little precipitation, peak late summer to fall
- Trees only near water
- Extreme summer heat
- Drying winds
- Range of winter temperatures
- Some sands, lots of caliche clays, mountain rubble

Image courtesy of Dr. Geoff Denny
Texas Regions

Trans Pecos

- Wide range of elevations, 2500 to 8500 ft.
- Well drained soils, some caliche
- Little rain, mostly late summer / fall (monsoonal)
- Winter lows & summer heat are elevation dependent
Texas Regions

Hill Country

- Moderately rugged terrain
- Caliche slopes, limestone escarpment, thin rocky clays
- Rainfall, 15 - 35 in./yr.
- Frequent summer droughts
- Mild to cold winters
- Mostly good drainage
West Texas & Southwestern U.S.


Overlaps in north with Intermountain West & West Coast plants, in east with semi-arid Hill Country and Southern Plains flora.
Painting With A Broader Brush, USA Regions: Southwestern US

- Very hot and very dry
  - Extended droughts any time of year, maybe for years
  - Chihuahuan, Mojave, & Sonoran Deserts
  - One to two peaks of precipitation

- Mountainous to flat basins
  - Terrain plays an important role in local climate
- Soils variable, but alkaline / pans problematic
- Heat, drought, soils, salts, high irradiance, and cold can all be limiting
Texas Regions

High & Rolling Plains

- Clays and sands over caliche
- Few woody plants
- Rain (10 - 20 in.) mostly May - June
- Coldest region of Texas
- Summers still hot, but cooler than all but Trans Pecos mountains
- Wind / hail can be very damaging

Images courtesy of Dr. Cynthia McKenney
Northwest Texas, Central Plains, and Intermountain Western U.S.

Transition area overlapping in the north with boreal species, in the north, in the west with West Coast plants, in the south with Southeastern U.S. flora and to the east with Midwestern and eastern U.S. flora.

This region includes several Texas cities such as Lubbock, Amarillo, Dalhart, and Dumas and many major cities in the Central and Intermountain USA.
Painting With A Broader Brush, USA Regions: Intermountain West

- Elevation, prevailing winds, and continental effects dominate climate
- Series of mountains, plateaus and basins
- Highly variable winter and summer temperatures
- Rainfall impacted by mountainous terrain and wind patterns, winter snowfall is important to vegetation
- Much of the region is drought prone, water issues dominate landscaping
- Soils variable from acidic to basic
- Fires & winter desiccation can be problems
“Aruba, Jamaica, oh I wanna take yah... to Bermuda, Bahamas, ...”
Texas Regions

Southern Rio Grande Valley

- Warm temperate to subtropical
- Little rain (18 - 27 in./yr.), long droughts
- Sands to heavy clays
- Irrigation waters with high salinity
- Drought deciduous not cold deciduous plants
- Chaparral or brush country
Texas Regions

Southern Gulf Coastal Plains

- Mild winters
- Rainfall becomes limiting (25 - 30 in/yr)
- Flat and often poorly drained
- Alkaline clay, caliche, sand
- Summers hot, winters mild
- Strong storms
South Texas & Immediate Gulf Coast

Protected locations in San Antonio, South Houston, Galveston, Corpus Christi, Brownsville, McAllen, South Padre, coastal developments from Texas to LA and in FL Panhandle, further inland in Central – South FL.

Overlaps in west with xeric Southwestern U.S. plants, in east with mesic SE U.S. plants.
Painting With A Broader Brush,
USA Regions:
Subtropical / Tropical Regions

• Encompasses portions of other regions:
  – Much of Florida
  – Immediate Gulf Coast MS, LA, TX
  – Lower Rio Grande Valley
  – Parts of Desert Southwest
  – Portions of Coastal California, Interior Valley of California, and Hawaii

• Salinity and wind tolerance important

• Local climates are hard to generalize, but cold is less of a limiting factor than in other US regions
Transition area overlapping in north with boreal species, in the north, west with Intermountain West flora and in the south with Southwestern U.S. and tropical flora.

This region includes numerous major cities along the West Coast of USA.
Painting With A Broader Brush, USA

Regions: West Coast

- Coastal temperate rainforest to dry Mediterranean climates
- Elevation and location relative to mountain ranges and ocean are important climatic factors
- Winter temperatures vary from subtropical to cold temperate
- Fog belts important for some ecosystems
- Wildfires are seasonal problem
- Soils are highly variable, but often fertile
Questions / Comments?

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