

*Plants for Landscape Design  
Regional Considerations  
HORT 306 Fall 2011*



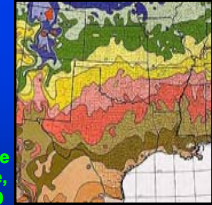
Unless otherwise noted all text and images are copyrighted by:  
Dr. Michael A. Arnold  
Dept. of Horticultural Sciences  
Texas A&M University  
College Station, TX 77843-2133  
email ma-arnold@tamu.edu

*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

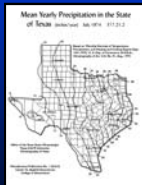


<http://www.nmra.usda.gov/Hardzone/uhkmzmap.html>



*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

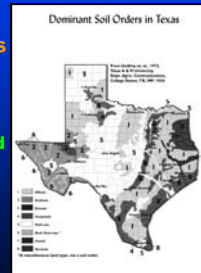


Examples:  
College Station average is @38 in./yr.,  
- But received over 16" in two days in fall 1995  
- 73 consecutive days without rain in summer 1993  
- Only 8" from December 1995 through July 1996  
- Over 50" of rain from January to August in 2007

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 zeric (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*

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

## 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

### Coastal Prairies



## Texas Regions

- 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

### East Texas (Piney Woods)



## Texas Regions

### Post Oak Savannah

- 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



## 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



## 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

### 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

Images courtesy of Dr. Cynthia McKeown

## Texas Regions

### Trans Pecos



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

## 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




## Painting With A Broader Brush, USA Regions: Midwest



- Cold winters, not 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

## Painting With A Broader Brush, USA Regions: Northeastern US

- 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



**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




**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

**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 snow fall 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





**Painting With A Broader Brush, USA Regions: Southwestern US**

- **Very hot and very dry**
  - Extended droughts any time of year
  - 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

**Painting With A Broader Brush, USA Regions: West Coast**




- Coastal temperate sub-tropical 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

**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





## *Questions / Comments?*

All material represented herein are copyrighted by the author, or otherwise as indicated, with all rights reserved.

For permission to reproduce text or images from this presentation write:

Dr. Michael A. Arnold  
Dept. of Horticultural Sciences  
Texas A&M University  
College Station, TX 77843-2133  
email [ma-arnold@tamu.edu](mailto:ma-arnold@tamu.edu)