Plants for Landscape Design
HORT 608
Fall 2018

Disease, Pest, and Cultural Practices Impact
Landscape Design Sustainability

Required Reading
- There is no formal required reading with this lecture, but remember that many of the terms covered in this lecture are in the glossary of your text and you should look them up if you are not familiar with them.
- Also color images of some pest, disease, and cultural conditions referenced in this section are provided in the first color plate section of your text.

90 / 10 Rule
- Thousands of potential pathogens / pests
- A few common diseases and pests account for many of our landscape problems
- Separate pest, disease, and mechanical damage
- Important to recognize pathogen / pest damage from physiological disorders / deficiencies
- Often a complex of causal factors are the culprit
- Cultural conditions interact with all of the above and the plants

Susceptible host
Favorable Environment
Virulent pathogen

Physiological Disorders
- Mineral nutrient deficiencies/toxicities
- Physiological leaf scorch
- Spray injuries
  - Intentional sprays or unintentional drift
- Lightening strike
- Mechanical injuries
- Chemical injuries
- Sun scald
- Winter injury
- Circling roots
- Inadequate chilling
Susceptibility to physiological problems vary within a species

Provenance versus seed source!

What’s Causing This Damage?

Site Interacts With Disorders/Disease

Common Pests

- Insects
  - Chewing
    - (grasshoppers, Japanese Beetles, caterpillars, borers, bagworms, leaf miners, ants, termites)
  - Raspining
    - (thrips)
  - Piercing/sucking
    - (aphids, weevils, mealy bugs, scales, whiteflies, leafhoppers, sharpshooters)
Common & Uncommon Pests

• Arachnida (spiders, spider mites, scorpions)
• Mollusca (slugs / snails with slim trails)

Common Disease Problems

• Bacterial
  – Angular lesions, often near veins
  – Leaf spots (zinnia, Xanthomonas on geraniums)
  – Twig dieback, cankers (fire blight)
  – Phloem infections (wetwood / slime flux)
  – Xylella fastidiosa (fastidious xylem inhabiting bacteria)
  – Crown gall (Agrobacterium tumefaciens)

• Fungal
  – Circular lesions / spores
  – Root rots (cotton root rot)
  – Foliar diseases (sooty mold, Entomosporium leaf spot, black spot, powdery mildew)
  – Xylem clogging (Dutch elm disease, Verticillium wilt, Fusarium wilt, oak wilt)
  – Cankers (chestnut blight)
  – Twig dieback (juniper blight, anthracnose)
  – Damping-off (Pythium, water molds)
**Common Disease Problems**

- **Viral** (yellow mottle & bud drop of *Camellia*, tulip breaking virus, rose rosette virus)
- **Mycoplasma-like** (lethal yellows of palms)
- **Viroids** (chrysanthemum yellows)
- **Nematodes / Nemas** (root knot nematodes, microscopic eelworms)

**Cultural Conditions Are Often To Blame**

- Weedeater / lawn mower blights
- Construction damage
- Poor site prep / design / installation
- Shade / sun patterns
- Poor maintenance practices
  - Irrigation practices
  - Fertility
  - Pruning
  - Staking
  - Mulching
  - Planting

**Other cultural practices**

- Exposed Roots
- Windthrow from roots only in mulches
- Fill Soil & Compaction
- Graft incompatibility
- Graft incompatibility
Establishment Practices Are Critical

Avoid planting too deep!

![Graph showing survival after 3 years vs. planting depth](image)

**Firewood Landscapes**

![Image of a firewood landscape](image)

**Be Sparing On Pine Bark Mulch**

![Graph showing survival vs. pine bark mulch thickness](image)

**Irrigation issues**

- Zoning plants
  - Keeping the bank account in the black
  - Quantity & quality
- Salinity / pH concerns
- Subcanopy applications are critical for our region
- Interactions with soil conditions

![Images of irrigation and plant health](image)
Cost-benefits to site modifications

- Soil replacements
- Soil amendments

Typical home site in Central Texas

Traits To Consider When Selecting Adapted Plants For Our Region

- Specific challenges in our region
  - High day & night temperatures
  - Poor internal drainage in many soils
  - High salts / bicarbonates in irrigation water
  - High pH soils in many locations
  - Widely fluctuating winter temperatures
  - Thin rocky soils or heavy clays

Be Cognizant of Hazardous Plants

- Salt crust from irrigation
- Limestone soil
- Expansive clays

- Cactus 1: boy 0 (as in ouch!)
Design Solution to Leaf Raking?

Image Courtesy of a former student

Questions / Comments?

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