



# Top 10 Abiotic Diseases -Woody Ornamentals-

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# Plant Diseases

Disease – *anything that affects the normal function of the plant.*

- Biotic – caused by living organisms
  - Bacteria
  - Viruses
  - Fungi
  - Nematodes
- Abiotic – caused by non-living stresses
  - Environmental / temperature extremes
  - Soil properties / pH
  - Chemical damage / salt injury
  - Mechanical damage



# Field Observation

- Ask a lot of questions
- Pay attention to environmental queues
- Take note of site history.
  - Biotic Diseases
    - Usually are scattered or randomly distributed.
  - Abiotic Diseases
    - Typically appear in patterns or display uniformity



Poor sprinkler coverage

Ground sterilant damaging trees



# 3 Steps in Diagnosing Diseases...

- 1- Know the plant affected.
- 2- Know the reported diseases.
- 3- Know that it can be difficult.



# USU Extension - Helps



- Utah Plant Pest Diagnostic Lab (UPPDL)
  - Located on Logan campus
- Sample submission is only \$5.<sup>00</sup>
  - Insect pest identification
  - Plant diseases identification

<http://utahpests.usu.edu>

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# Symptoms vs. Signs



**Symptom** - plants response to stress.

- patches, rings
- wilting, die-back
- yellowing

**Sign** - evidence of the causal agent.

- fruiting structures
- mycelium
- mold
- people
- packaging material



# Top 10 Abiotic Diseases

- Iron chlorosis
- Planting depth
- Girdling roots
- Mechanical damage
- Packaging material
- Excessive irrigation
- Summer scorch
- Herbicide damage
- Winter damage
- Salt damage

# Iron Chlorosis

## Symptoms:

- interveinal yellow tissue
- green veins
- current seasons growth
- marginal burning

## Causes:

- alkaline soils
- soil compaction
- saturated soils

## Remedies:

- Avoid sensitive plant species
- Aerate compacted sites
- Avoid water saturated soil conditions
- Apply chelated iron (FeEDDHA) in early spring before growth begins



# Planting Depth

## Symptoms:

- slow growth rate
- thinning tree canopy
- early die-back
- lack of visible root flare
- trunk decay



## Causes:

- re-potted nursery stock
- depth of planting hole – too deep
- buried root flare on B&B trees

## Remedies:

- Select high quality nursery stock
- Examine planting depth before purchase
- Look for voids around the tree trunk in container
- Plant root flare at final soil grade



# Circling / Girdling Roots

## Symptoms:

- overlapping roots visible
- progressive thinning of tree canopy
- branch die-back
- early tree death

## Causes:

- root circling induced by containers
- width of planting hole - too narrow
- root bound nursery stock

## Remedies:

- Purchase healthy nursery stock
  - not root bound
  - less than 2 years in original container
- Scoring or “teasing” roots apart is typically not recommended with woody plants
- Dig planting hole 2-3 times wider than root ball



# Mechanical Damage

## Symptoms:

- slow growth rate
- die-back above damaged area
- sunken or sloughing bark
- signs of visible damage

## Causes:

- improper pruning practices
- lawn care equipment damage
- animal damage (deer, rodents, cats)
- negligent acts (vandalism)

## Remedies:

- Choose the right size of plant for the area
- Keep turfgrass and lawn care equipment away from tree trunks
- Avoid “topping” trees when pruning



# Packaging Material

## Symptoms:

- slow growth rate
- gradual decline in health of the plant
- signs of visible packaging material
- may eventually cause death

## Causes:

- nursery tags, wire baskets, twine, staking materials, and even containers are left on the plant, usually at the time of planting.

## Remedies:

- Remove all packaging materials at the time of planting
- Carefully avoid disturbing the root ball when planting
- Carefully remove packaging on B&B plants after placing them in the planting hole



# Excessive Irrigation

## Symptoms:

- poor root establishment
- gradual decline in health of the plant
- iron chlorosis
- root rot problems
- weak or stunted growth
- can mimic drought-stress symptoms

## Causes:

- excess irrigation
- compacted or heavy clay soils
- poor drainage

## Remedies:

- Reduce irrigation.
- Water deep and infrequently
- Improve soil drainage
- Plant in raised beds



# Summer Scorch

## Symptoms:

- browning of the leaf margins
- reduced vigor - late season
- damage increases with heat
- may cause brown inter-veinal spotting
- target rings

## Causes:

- hot, dry summer winds
- more problematic on larger leaves
- poorly watered trees
- some plants are just prone to damage

## Remedies:

- Water deep during summer heat
- Reduce spring fertilization
- Use mulches at tree base
- Improve soils water-holding capacity





# Herbicide Damage

## Symptoms:

- curling or cupping leaves
- prominent veins
- inter-veinal discoloration
- elongated stem growth
- may eventually cause death

## Causes:

- broadleaf weed killer misuse
- soil sterilant damage

## Remedies:

- Use all herbicides according to label
- Avoid soil sterilants in the vicinity of desirable plants
- Keep damaged trees as healthy as possible



# Winter Damage

## Symptoms:

- brown needles or leaves in spring
- excessive needle drop
- dieback of twigs and small branches
- southern exposed bark damaged

## Causes:

- dry winter winds
- inadequate soil moisture for evergreens
- young thin bark subject to freezing temperature fluctuations

## Remedies:

- Insure sufficient soil moisture in fall and winter.
- Protect young trunks
- Place plant in proper exposure



# Salt Damage

## Symptoms:

- brown needles on new growth
- drought stress in appearance
- leaves scorch as they emerge in spring



## Causes:

- heavy native salts in soils
- excess salts from de-icing materials
- over-fertilization



## Remedies:

- Use low salt de-icing materials
- Fertilize properly (consider soil testing before applying fertilizer)
- Water deeply to leach excess salts from soils
- Use salt tolerant plants in vulnerable locations





# Questions?

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