

Top Ten Abiotic Disorders and Cultural Problems of Woody Ornamentals

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Abiotic diseases are the result of non-living influences which have a negative effect on the normal growth and function of plants. These problems consist of environmental stresses, temperature extremes, and physical, mechanical or chemical damage. Many of these negative influences can occur simultaneously on plants and can be prevented by proper plant selection and maintenance practices. Because symptoms are a plant's general response to stress, and may appear similar to other problems, correct diagnosis can be difficult. Incorrect diagnosis can lead to unnecessary applications of pesticides. Overuse of pesticides is not helpful and may harm the environment.

Circling/Girdling Roots

Constricting roots that reduce proper flow of water and nutrients

Symptoms

- Visible overlapping roots
- Progressive thinning of tree canopy
- Branch dieback
- 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
- Dig planting hole 2-3 times wider than root ball



Iron Chlorosis

A common nutrient deficiency in alkaline soils

Symptoms

- Interveinal yellow leaf tissue
- Veins remain green
- Occurs on current season's growth
- Marginal burning

Causes

- Alkaline soils
- Soil compaction
- Saturated soils

Remedies

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



Mechanical Damage

Practices that result in physical damage of plant tissue

Symptoms

- Slow growth rate of tissues
- Dieback 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



Excessive Irrigation

Practices that deplete oxygen from the root zone

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
- Poor drainage

Remedies

- Reduce irrigation
- Water deep and infrequently
- Improve soil drainage
- Plant in raised beds
- Aerate compacted soils



Planting Depth

Planting too deep reduces available oxygen to the roots & causes trunk decay

Symptoms

- Slow growth rate
- Thinning tree canopy
- Early dieback
- 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 or above final soil grade



Packaging Material

Foreign materials left on plants that ultimately restrict growth

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 plants, 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 they have been placed in the planting hole



Herbicide Damage

Practices that cause spray or drift that damages non-target plants

Symptoms

- Curling or cupping leaves
- Prominent veins
- Interveinal discoloration
- Elongated stem growth
- May eventually cause death

Causes

- Misuse of broadleaf weed killers
- 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



Summer Scorch

When plants cannot physically translocate enough water to leaf margins

Symptoms

- Browning of the leaf margins
- Reduced late season vigor
- Damage increases with heat
- May cause brown interveinal leaf spotting
- Concentric rings on leaves

Causes

- Hot dry summer winds
- Larger leaves are more prone to damage
- Some plants scorch more readily

Remedies

- Water deep during summer heat
- Reduce spring fertilization
- Use mulches at tree base



Salt Damage

High levels of salt reduce the plant's ability to uptake water (chemical drought)

Symptoms

- Brown needles
- Symptoms similar to drought stress
- Leaves scorch as they emerge in spring

Causes

- Excess salts in native soils
- Excess salts from de-icing materials
- Over-fertilization

Remedies

- Use low salt de-icing materials.
- Fertilize properly (consider soil tests before fertilization)
- Deep water to leach excess salts from soils
- Use salt-tolerant plants in vulnerable locations



Winter Damage

Fluctuations in temperatures that ultimately damage plant tissues

Symptoms

- Brown needles or leaves in spring
- Excessive needle drop
- Dieback of twigs and small branches
- Southern exposed bark damaged

Causes

- Dry fall and winter winds
- Inadequate soil moisture for evergreens
- Young thin bark subject to temperature fluctuations

Remedies

- Insure sufficient soil moisture in fall and winter
- Protect young trunks with white reflective wrap
- Proper site selection for plants



For more information, go to
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