



# Abiotic Tree Issues

A Scouting Guide

# Abiotic Tree Issues



Cultural



Soil



Biological



Weather



Animal



Mechanical



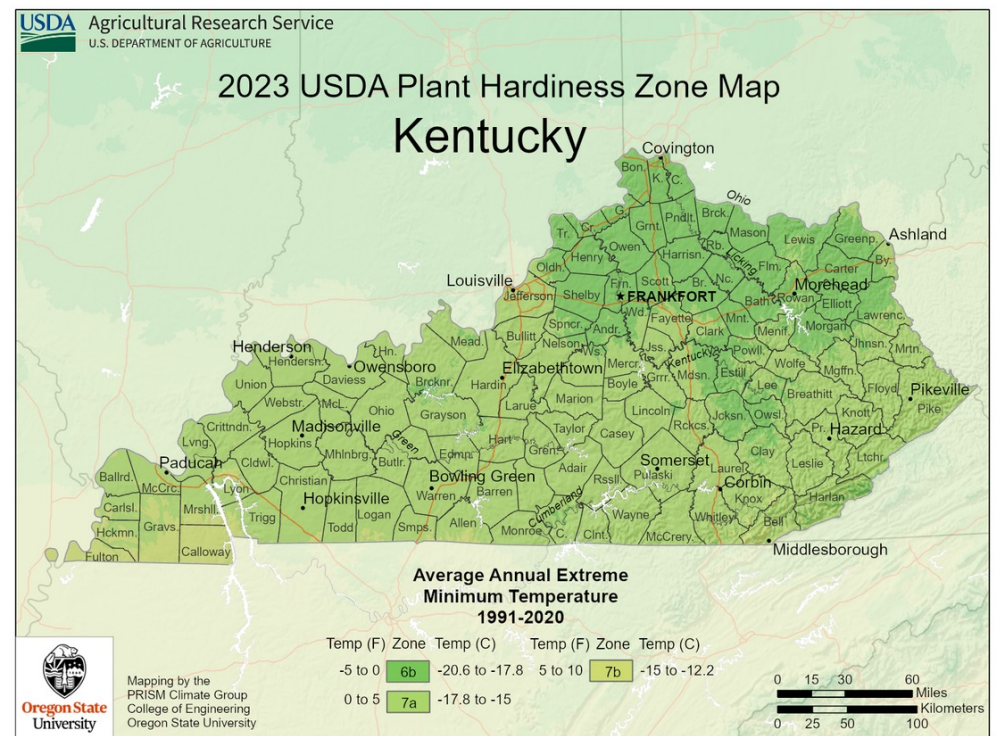
Chemical



# Cultural Conditions

## Plant Selection

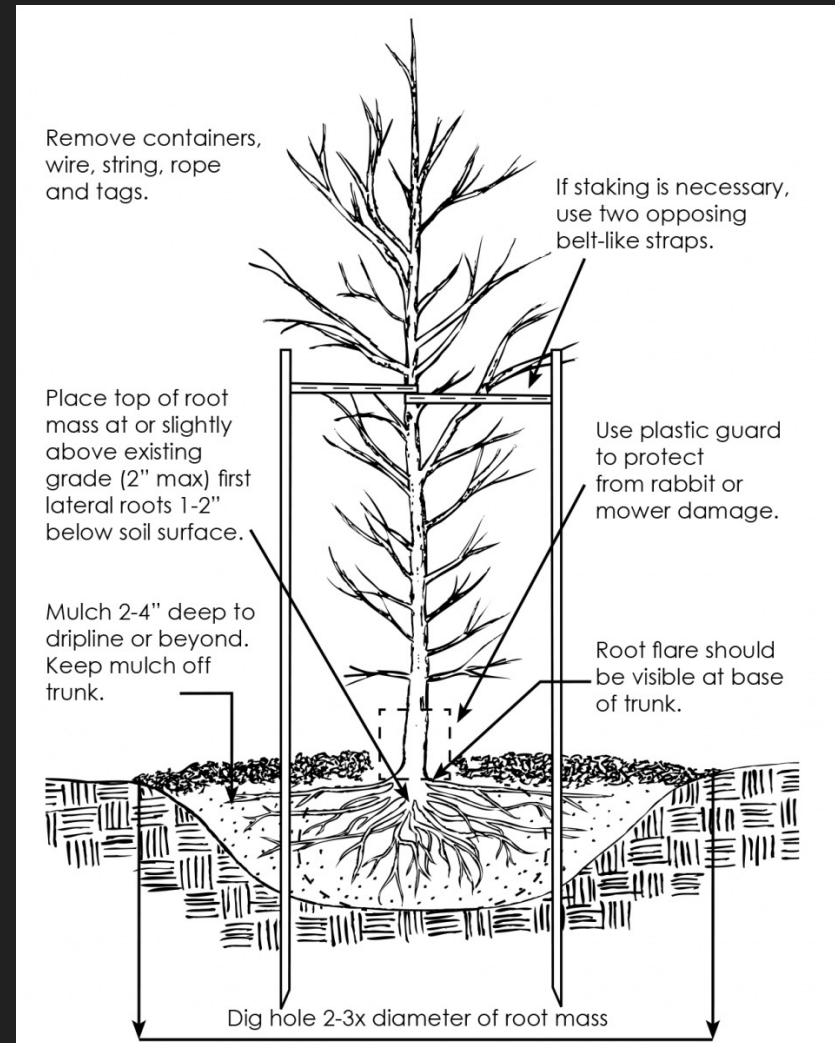
- Crape Myrtle (*Lagerstroemia* spp.)
  - Zone 7
  - Zone 6 (Tonto, Hopi, Potomac, Osage)
- Chaste Tree (*Vitex agnus-castus*)
  - Zone 7
- Boxwood, Azalea, Holly, Southern Magnolia



# Cultural Conditions

## Planting Issues

- Too Deep
- Mulch Practices
- Girdling Roots
- Irrigation





# Too Deep

- CAUSE
  - Nursery stock not checked
  - Rootball settling
- CORRECTIVE ACTIONS
  - Root collar excavation
  - Lift and replant, if possible





# Excessive Mulch

- CAUSE
  - Copycat crime
  - Lack of knowledge
- CORRECTIVE ACTIONS
  - 2-4" deep
  - Keep a gap against the trunk
  - Wider is better



# Girdling Roots

- CAUSE
  - Poor production methods
  - Poor soil conditions
  - Excessive mulch
  - Narrow hole size
- CORRECTIVE ACTIONS
  - Cut roots at planting
  - Cut roots of older trees gradually
  - Follow proper planting guidelines
  - 2 to 4" mulch





# Irrigation

- CAUSE
  - Frequent and shallow
  - Poorly drained sites
  - Location
- CORRECTIVE ACTIONS
  - Deep watering
  - Soil amending
  - Target drip line





# Soil Conditions

## Soil Type

- CAUSE
  - Most trees need soil that drains well
  - Compounds issues with drought, flooding, and nutrients
- CORRECTIVE ACTIONS
  - Amend soil with organic matter
  - Tree selection









# Soil Conditions

## Compaction

### ○ CAUSE

- greatly reduced air spaces
- drain very poorly
- lead to plant death

### ○ CORRECTIVE ACTIONS

- vertical mulching
- radial trenching
- tilling in organic matter







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# Soil Conditions

## Changes in Water Flow

- CAUSE

- Inadvertently diverting water to a tree or shrub
- Poorly draining downspout

- CORRECTIVE ACTIONS

- Look for leaking gutters and downspouts that do not empty far enough away from the building
- In some cases, a total regrading of the site may be necessary



# Soil Conditions

## Grade Changes

### ○ CAUSE

- Any changes to the original soil grade are usually very harmful to trees
- Limit change to 3 inches

### ○ CORRECTIVE ACTIONS

- Addition of 3 inches requires a tree well
- Removal of 3 inches requires a terrace

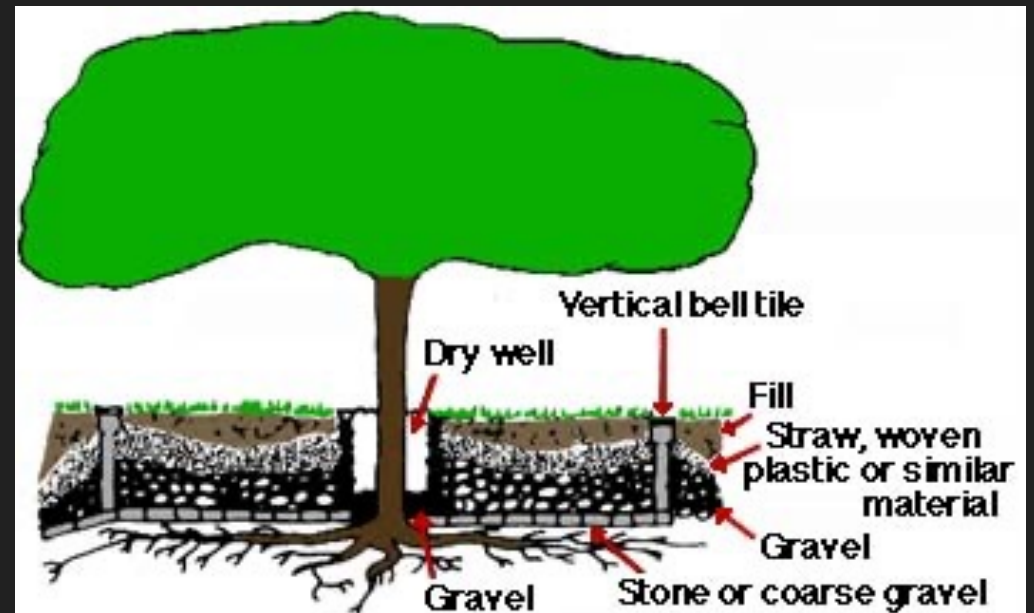


Fig 2. A cross section of a completed fill is shown around an established tree. Soil fill is placed over the ventilating tile system.











# Soil Conditions

## Nutrient Deficiency

- Trees need certain nutrients for proper growth
- Have soil and foliage analyzed. Apply the deficient elements



Magnesium  
Deficiency



Iron Deficiency



Phosphorous  
Deficiency







# Biological Conditions

## Genetic Anomalies

- CAUSE
  - Unknown
- CORRECTIVE ACTIONS
  - Prune out reversions
  - Replace the plant
  - Create a new cultivar





# Biological Conditions

## Leaf Abscission and Marcescence

- CAUSE
  - Normal tree function
  - Occurs for evergreens and deciduous
- CORRECTIVE ACTIONS
  - Recognize what is normal for your tree
  - Leaf drop or retention out of the normal time frame could indicate a pest issue





# Biological Conditions

## Galls and Burls

- CAUSE
  - Unknown
  - Sometimes triggered by insect or disease
- CORRECTIVE ACTIONS
  - Observe





# Biological Conditions

## Branch Architecture

- CAUSE
  - Genetic makeup
- CORRECTIVE ACTIONS
  - Corrective pruning
  - Cabling or bracing









# Weather Conditions

## Low Temperatures

### ○ CAUSE

- Sudden drop in temperature (chilling injury)
- Subfreezing temperatures (freezing injury)

### ○ CORRECTIVE ACTIONS

- Plant selection
- Maximize plant health
- Avoid frost pockets
- Do not use high-nitrogen fertilizer late in the growing season.





# Weather Conditions

## Winter Desiccation

- CAUSE
  - Temperature + Wind
  - A form of drought stress
- CORRECTIVE ACTIONS
  - Anti-transpirants
  - Plant selection
  - Mulch





# Weather Conditions

## Frost Heaving

- CAUSE
  - Roots exposed due to alternate freezing and thawing of soil
  - Common for late planted trees and shrubs
- CORRECTIVE ACTIONS
  - Follow good planting practices



Frost heaving is most common in small, new plantings. The danger is root exposure. Replant quickly.



# Weather Conditions

## Snow and Ice

- CAUSE
  - Excessive snow or ice
- CORRECTIVE ACTIONS
  - Carefully remove excessive snow
  - Allow ice to melt naturally
  - Corrective pruning before pre and post event





# Weather Conditions

## Sunscauld and Frost Cracking

- CAUSE
  - Temperature + Light
  - Sunscald – sunken area of cambium
  - Frost cracks – vertical splits in bark
- CORRECTIVE ACTIONS
  - Use light-colored tree wraps
  - Apply latex paint





# Weather Conditions

## Drought and Heat Stress

- CAUSE
  - Increased water loss
  - Plant Moisture Stress
- CORRECTIVE ACTIONS
  - Water
  - Plant in protected locations
  - Delay pruning





# Weather Conditions

## Flooding

- CAUSE
  - Prolonged standing water
- CORRECTIVE ACTIONS
  - Plant selection





# Weather Conditions

## Lightning

- CAUSE
  - Summer storms
  - Damage varies widely
- CORRECTIVE ACTIONS
  - Clean the damaged area
  - Irrigate
  - Fertilize





# Animal Conditions

- CAUSE
  - Food supply and demand
- CORRECTIVE ACTIONS
  - Habitat reduction
  - Caging trees
  - Wire mesh on trunks
  - Repellants (maybe)











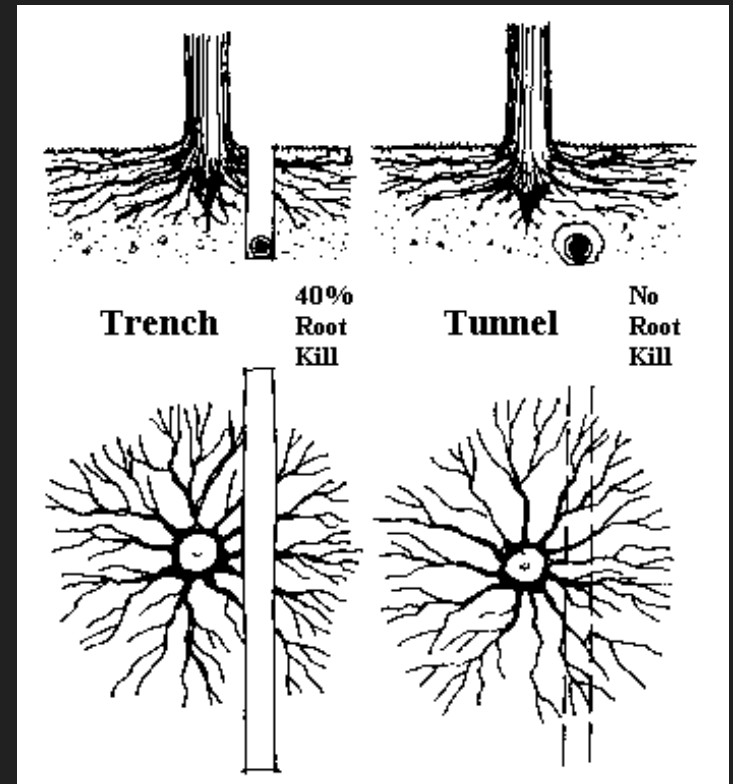
Joe Boggs, OSU Extension©



# Mechanical Conditions

## Root Damage

- CAUSE
  - Digging, trenching, and tilling in the root zone
- CORRECTIVE ACTIONS
  - Avoid
  - Tunnel utilities





# Mechanical Conditions

## Mowing Injury

- CAUSE
  - Damage to the trunk with string trimmers or mowers
- CORRECTIVE ACTIONS
  - Mulch for avoidance
  - Water
  - Fertilize





# Chemical Conditions

## Salt Injury

- CAUSE
  - Salt spray near roads
  - Salt runoff to root zone
- CORRECTIVE ACTIONS
  - Irrigate with lots of water
  - Tree selection (white oak, walnut, Ohio buckeye)
  - Use plant-friendly deicing materials





# Chemical Conditions

## Herbicide Injury

- CAUSE
  - Non-target applications direct or drift
- CORRECTIVE ACTIONS
  - Wash leaves immediately
  - Activated Charcoal (2lbs per 100sf at 6" depth)
  - Patience





# Thank you!

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