

Irrigating Urban Trees During Drought

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Irrigating Urban Trees During Drought

- What's the problem?
- Water stress symptoms and effects
- Water use
- Irrigating trees

Prioritizing Plants to Irrigate

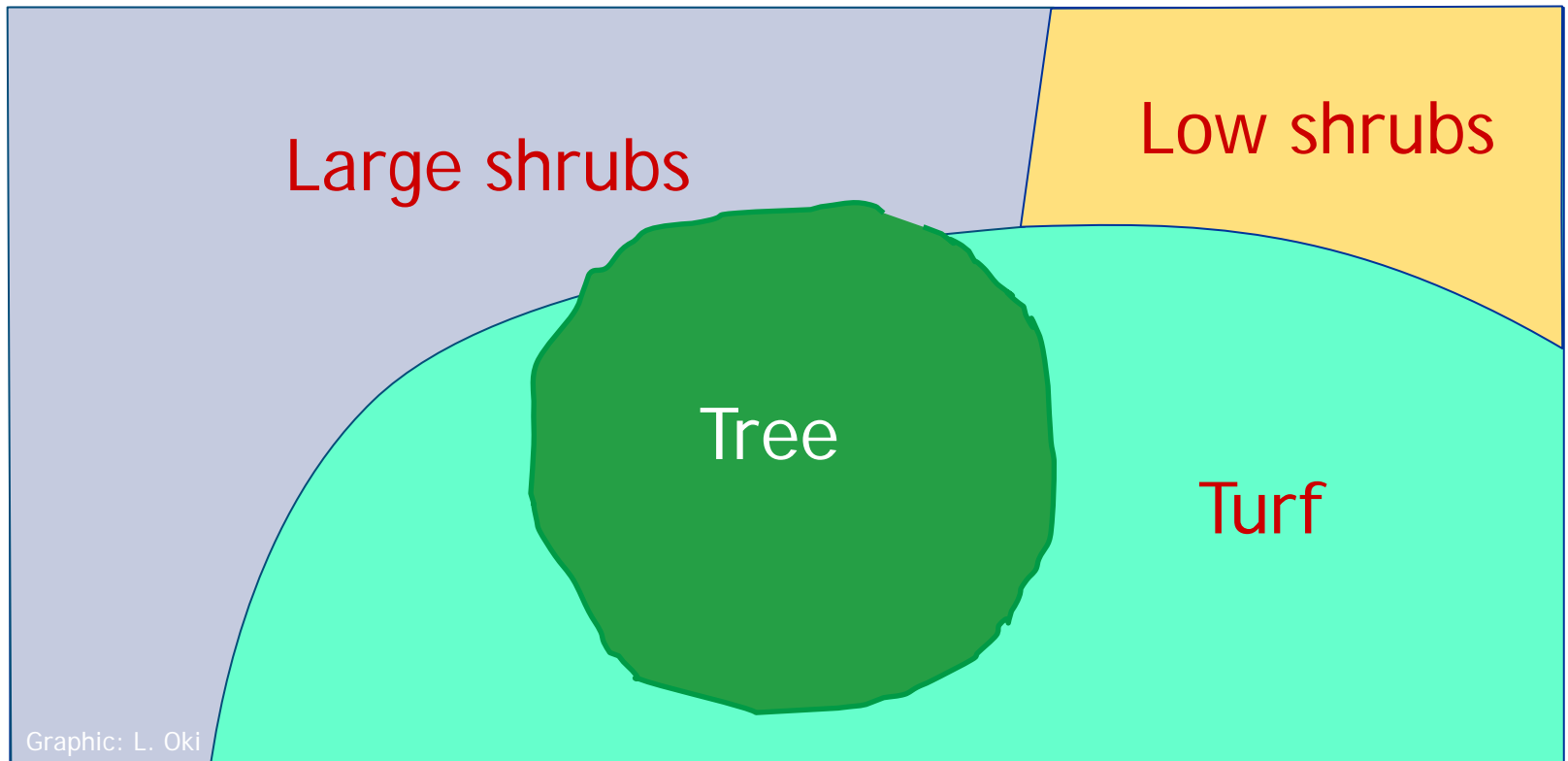
Considerations:

- Cost of replacement
- Beneficial use
 - Example: City of Folsom
 1. Top Priority: Maintain trees
 2. Active sports fields
 3. Ornamental plantings
 4. Non-active or ornamental turfgrass

Trees in lawns

What's the problem?

- Mixed species planting



Trees in lawns

What's the problem?

- Improper tree selection
- Poor irrigation management
- Shallow roots



Photo: J. Borneman

A Common Sight in 2014



Photos: C. Ingels



Recognize water stress

- Incipient
 - Color change to bluish or grayish green
- Temporary
 - Flagging, wilting
- Permanent wilting
 - Desiccation, drying
 - Nonrecoverable



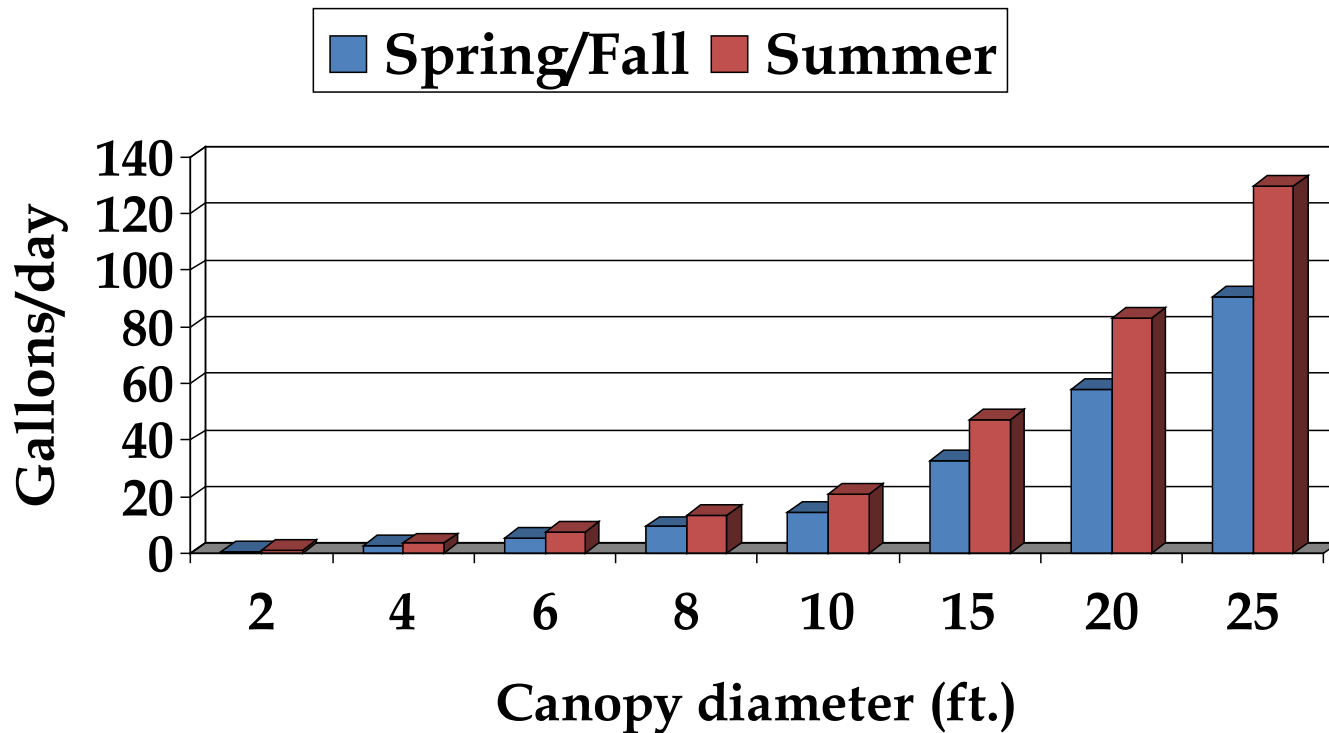
Secondary effects

- Susceptibility to:
 - Insects
 - e.g., Borers
 - ambrosia beetles
 - longhorned eucalyptus borers
 - Diseases
 - e.g., Root rots
 - *Phytophthora* and Oak root fungus
 - *Armillaria*



Photos: S. Swain & J. Kabashima

Fruit Tree Water Use Central Valley Relative to Tree Size



Water use is related to canopy density & size

Larger canopy
(Uses more water)



Photos: C. Ingels

Smaller canopy
(Uses less water)



Things that increase water use

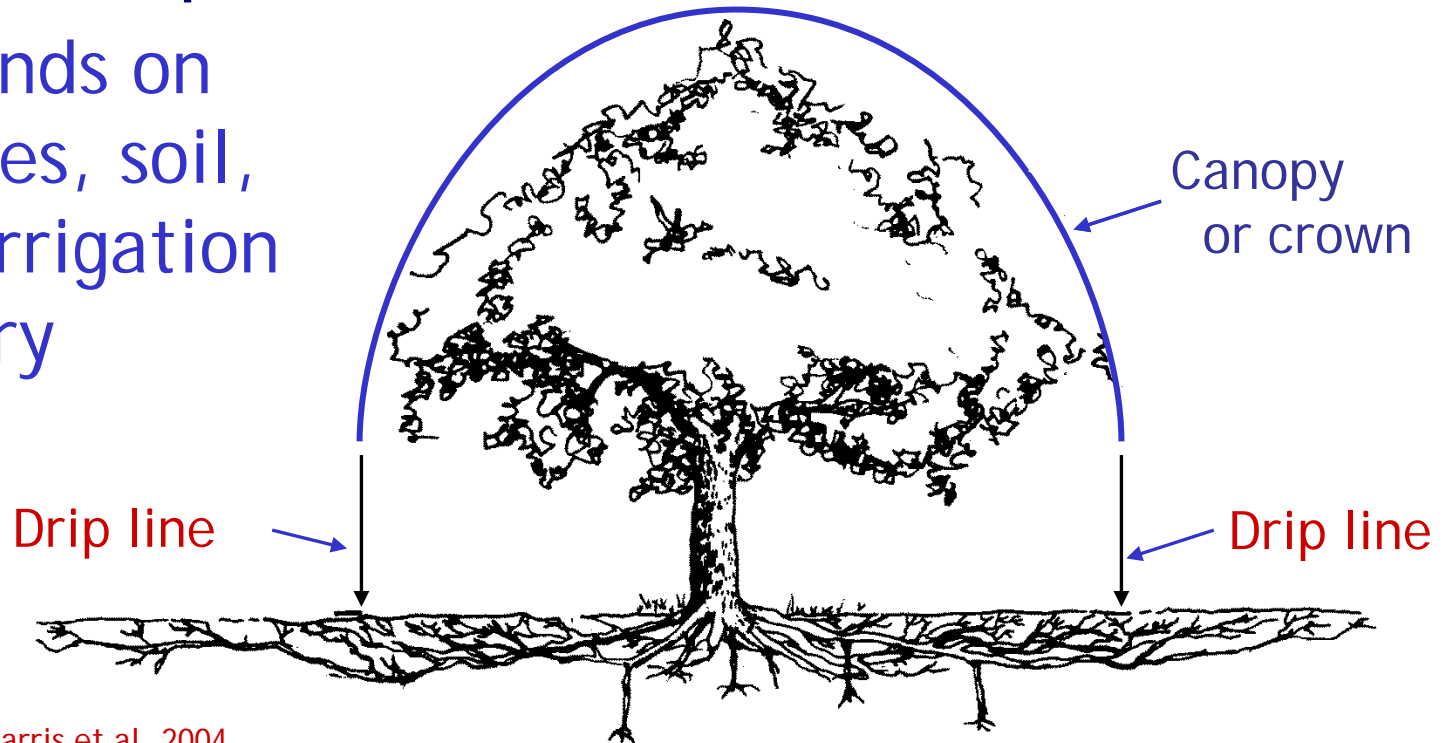
- Heat absorbing or reflecting surfaces
 - Parking lots
 - Large concrete/asphalt surfaces
 - West and south facing walls
- Wind
- Low humidity



Photo: L. Oki

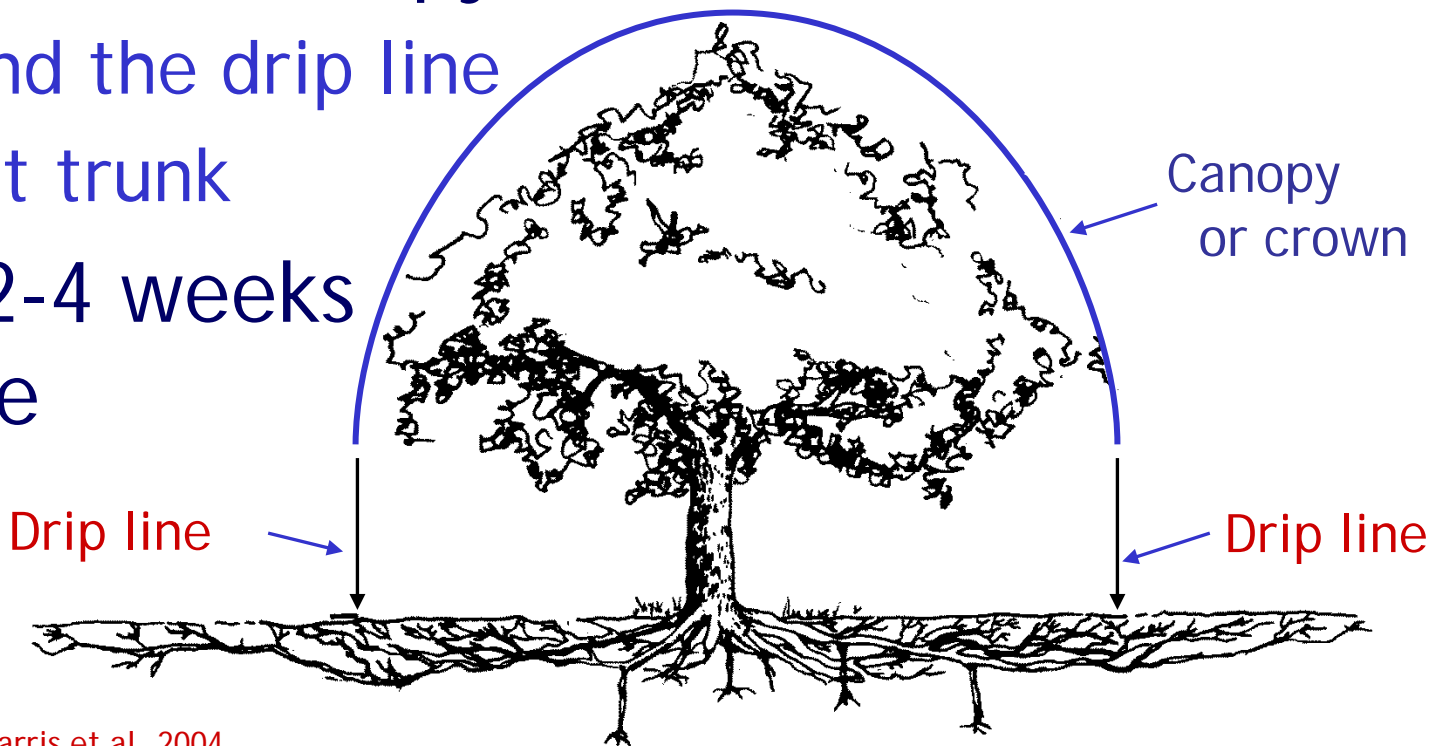
Tree roots

- Relationship to canopy
- May be deep
 - Depends on species, soil, and irrigation history



Where to Irrigate

- Deep to 2 -3 feet
- Beneath the canopy
 - Beyond the drip line
 - Not at trunk
- Every 2-4 weeks or more



Mature Ginkgo Tree

Considered Deep Rooted





Tree Ring Irrigation Contraption

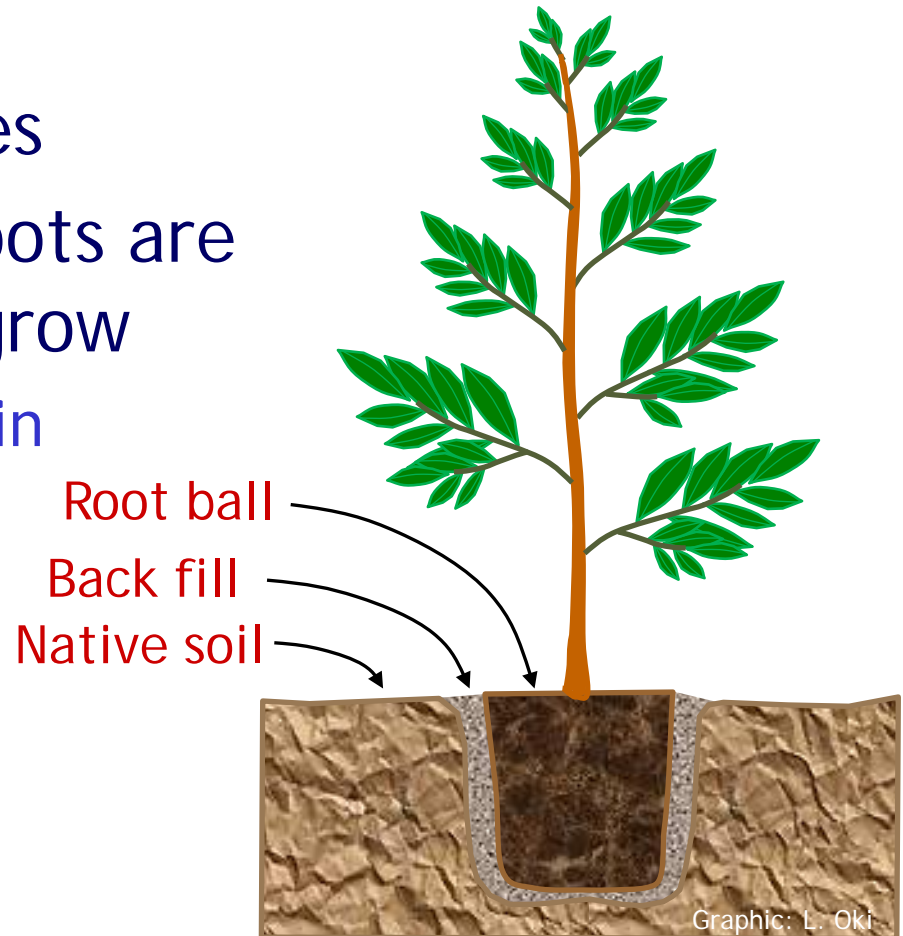
Loren Oki and Dave Fujino

- Calculates run time to wet soil to 36" deep
- Input info for 1' spacing:
 - Canopy radius, soil type, no. of 100' drip lengths (Netafim)
- <http://ccuh.ucdavis.edu/>
 - Search: CCUH TRIC

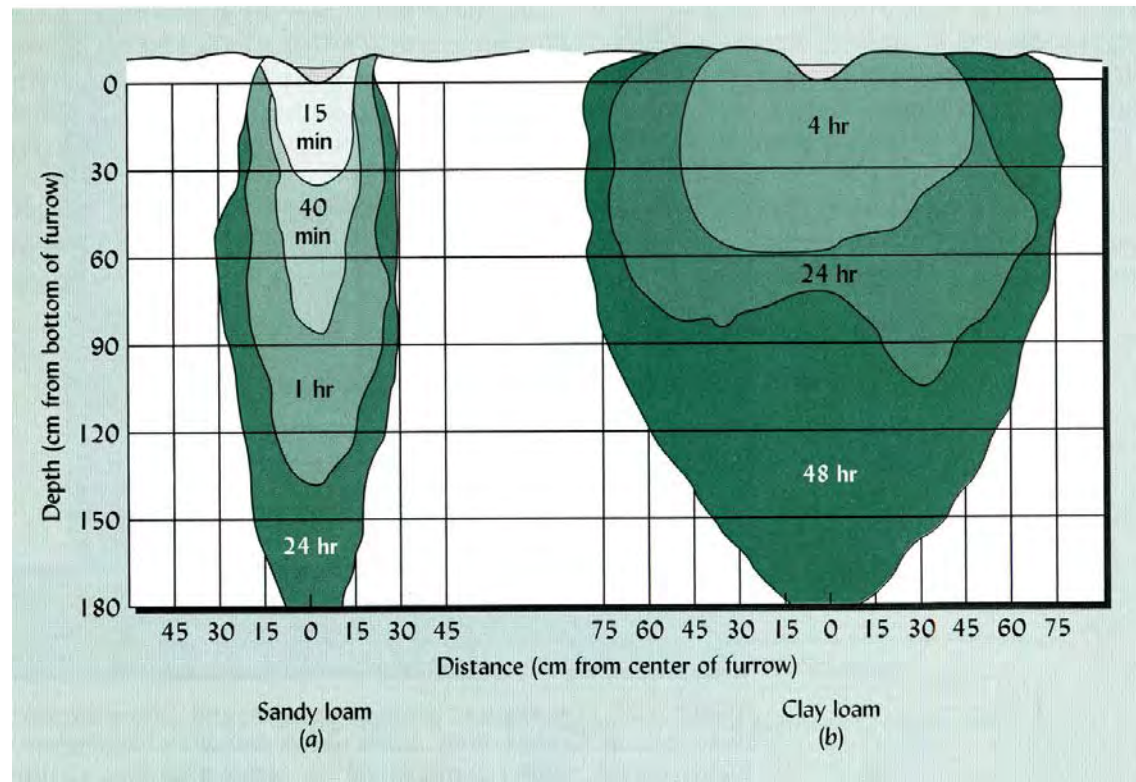


Tree roots

- Recently planted trees
- Apply water where roots are and where they will grow
 - Roots are mostly within the container soil ball
 - Roots may be just entering native soil
 - Will take several years to fully establish



Soil Texture Affects Soil Moisture



Sandy: Apply small amounts frequently

Clay: Apply larger amounts slowly, less often

Adjust Tree Water Irrigation

- Light pruning to reduce leaf area
 - DO NOT prune heavily
- Change irrigation schedule SLOWLY
EXAMPLE:
 - 3x per week- original schedule
 - 2x per week for 2 weeks
 - 1x per week for 2 weeks
 - 1x per 2 weeks
- Watch for water stress symptoms
 - Adjust accordingly

Adjust Program

- Adjust irrigation to seasonal weather
 - Look for water stress symptoms
- Interval vs. duration
 - Adjust interval between irrigations
 - 3 days per week to 2 days = 33% reduction
 - DO NOT change duration (run time)
 - Affects wetting depth

Mulching

- Acts like a blanket over the soil
- Reduces
 - Direct evaporation
 - Soil temperatures
- 2-4 inch layer



Photo: L. Oki

Use Compost

- Adds organic matter
- Improves
 - Texture and structure
 - Water infiltration
 - Water holding capacity
 - Biological activity



Irrigating with Limited Water

- Irrigate deep & not too often
- Use water conservation practices
- Prioritize plants that receive water
- Know water stress symptoms
- Precondition to enhance survival
- Manage salinity



Thank you
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