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

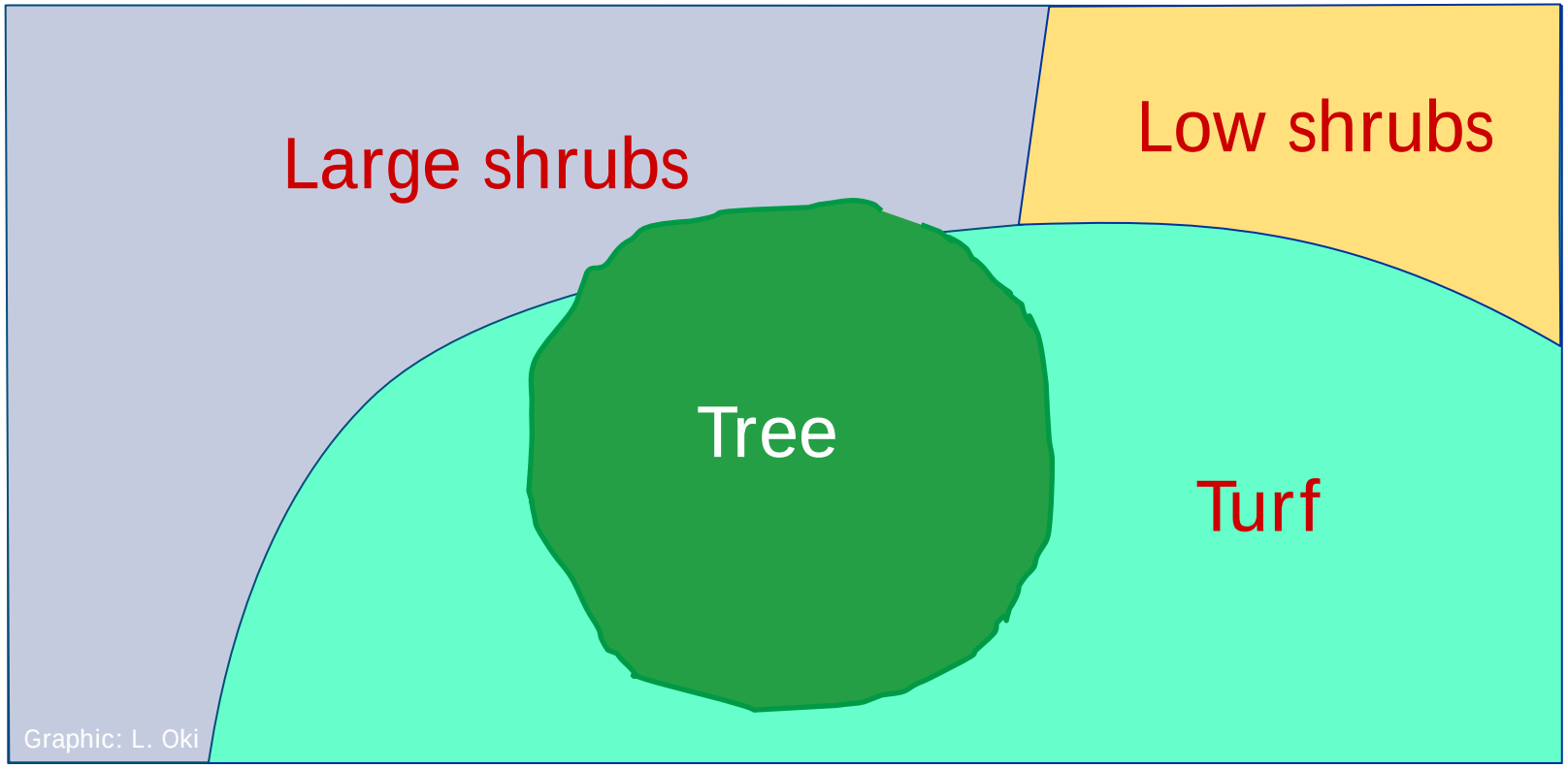
Considerations:

- 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?

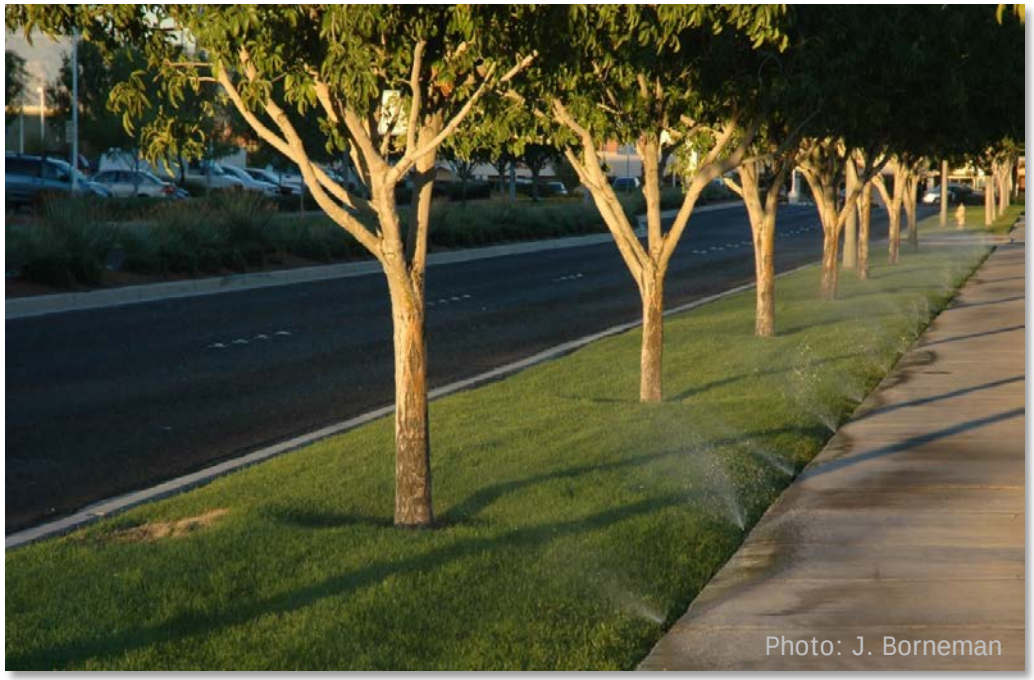
- Mixed species planting



Trees in lawns

What's the problem?

- Improper tree selection
- Poor irrigation management
- Shallow roots



A Common Sight

Photos: C. Ingels

Recognize water stress

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

Secondary effects

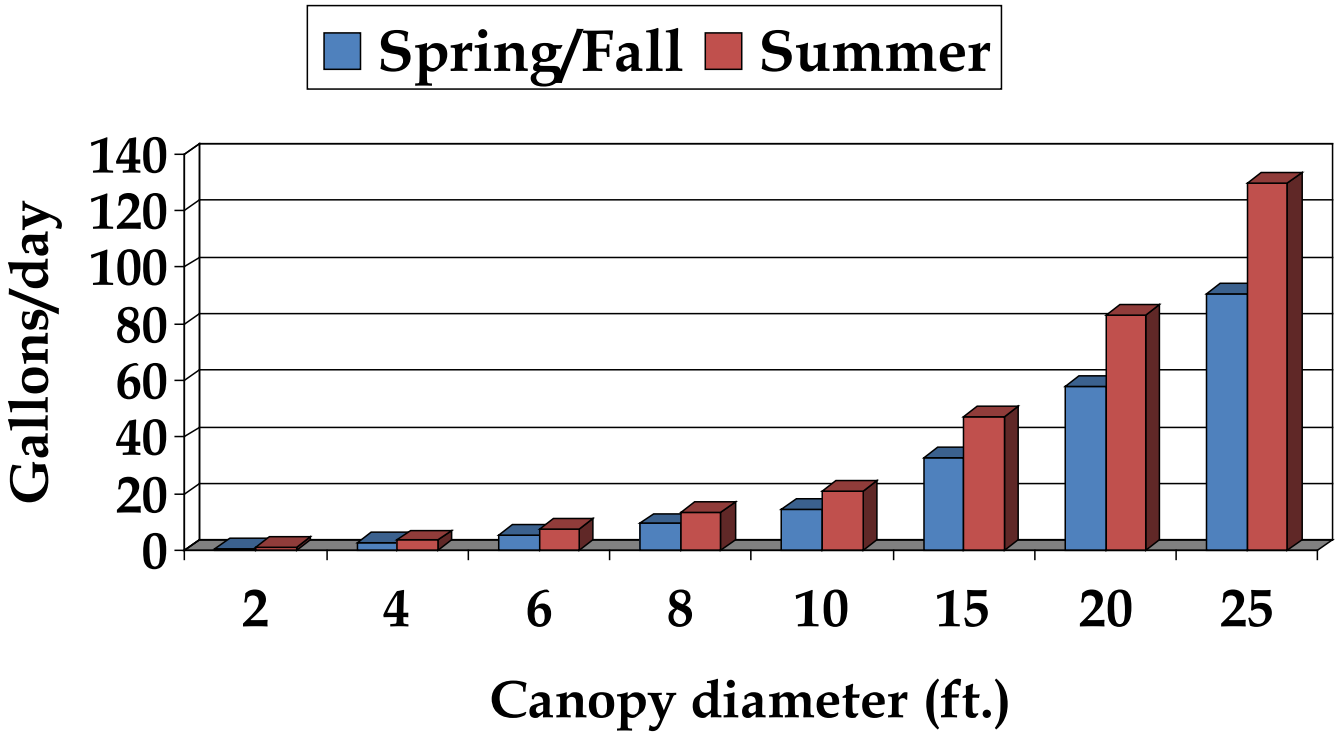
- Susceptibility to:
  - Insects

    e.g., Borers
    - ambrosia beetles
    - longhorned eucalyptus borers
  - Diseases

    e.g., Root rots
    - *Phytophthora*

    and Oak root fungus
    - *Armillaria*

Fruit Tree Water Use
Central Valley
Relative to Tree Size



Source: The Home Orchard, UC ANR

Water use is related to canopy density & size

Larger canopy
(Uses more water)

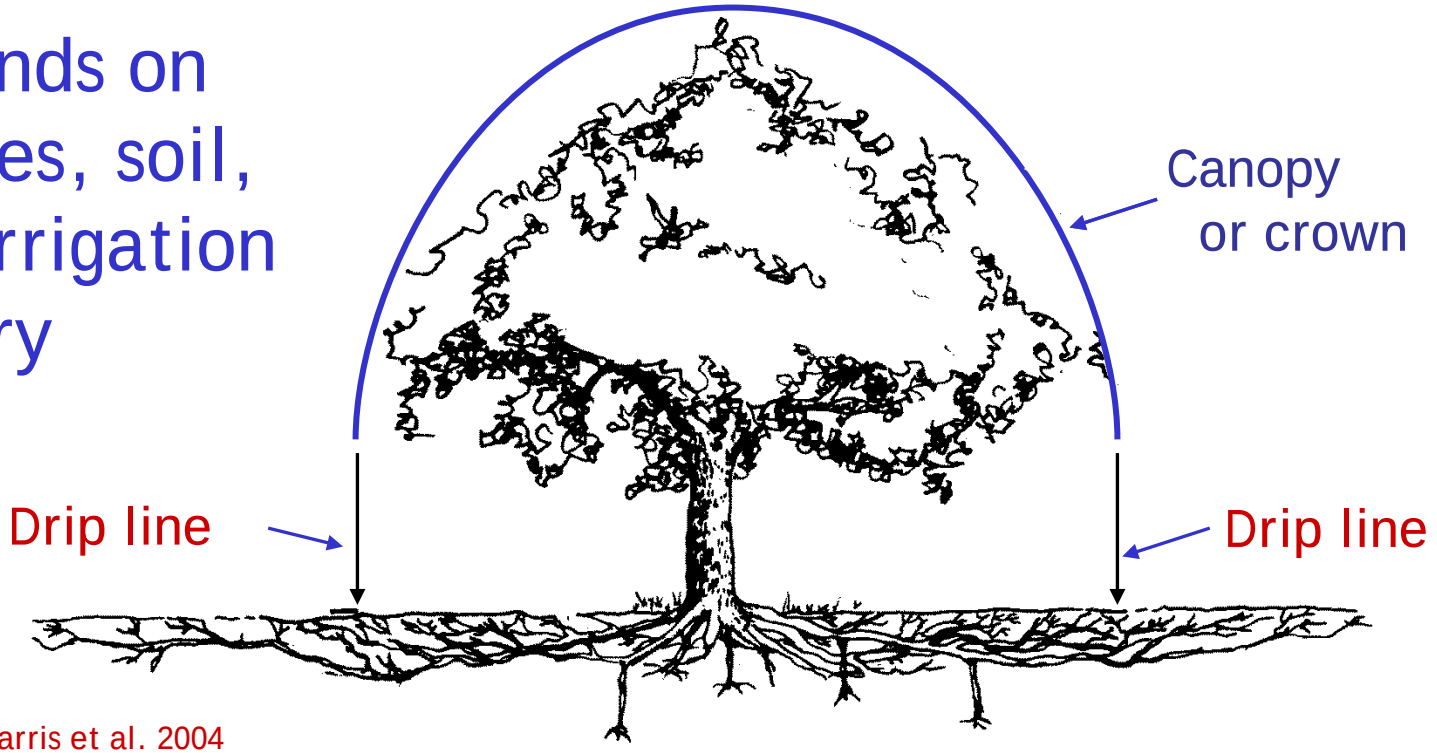
Smaller canopy
(Uses less water)

Things that increase water use

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

Tree roots

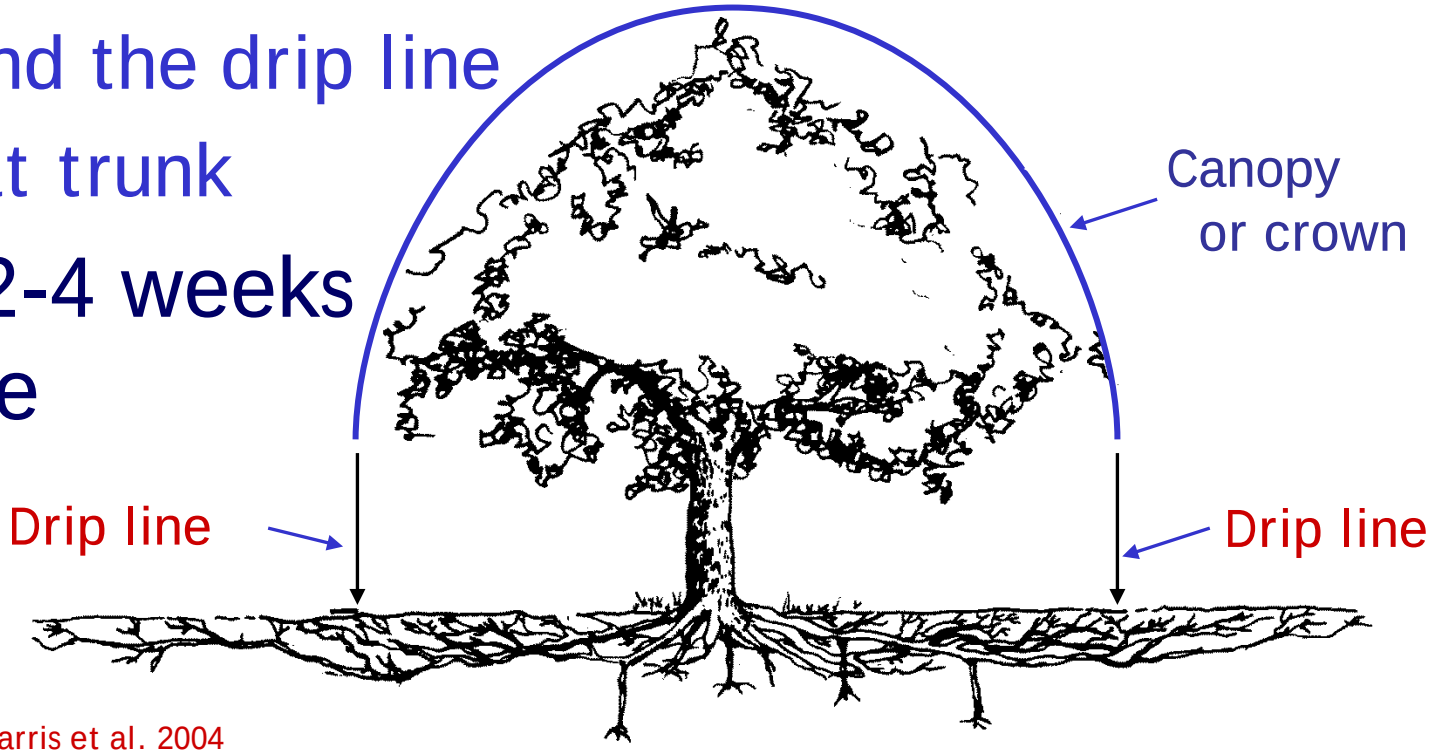
- Relationship to canopy
- May be deep
  - Depends on species, soil, and irrigation history



Graphic adapted from Harris et al. 2004

Where to Irrigate

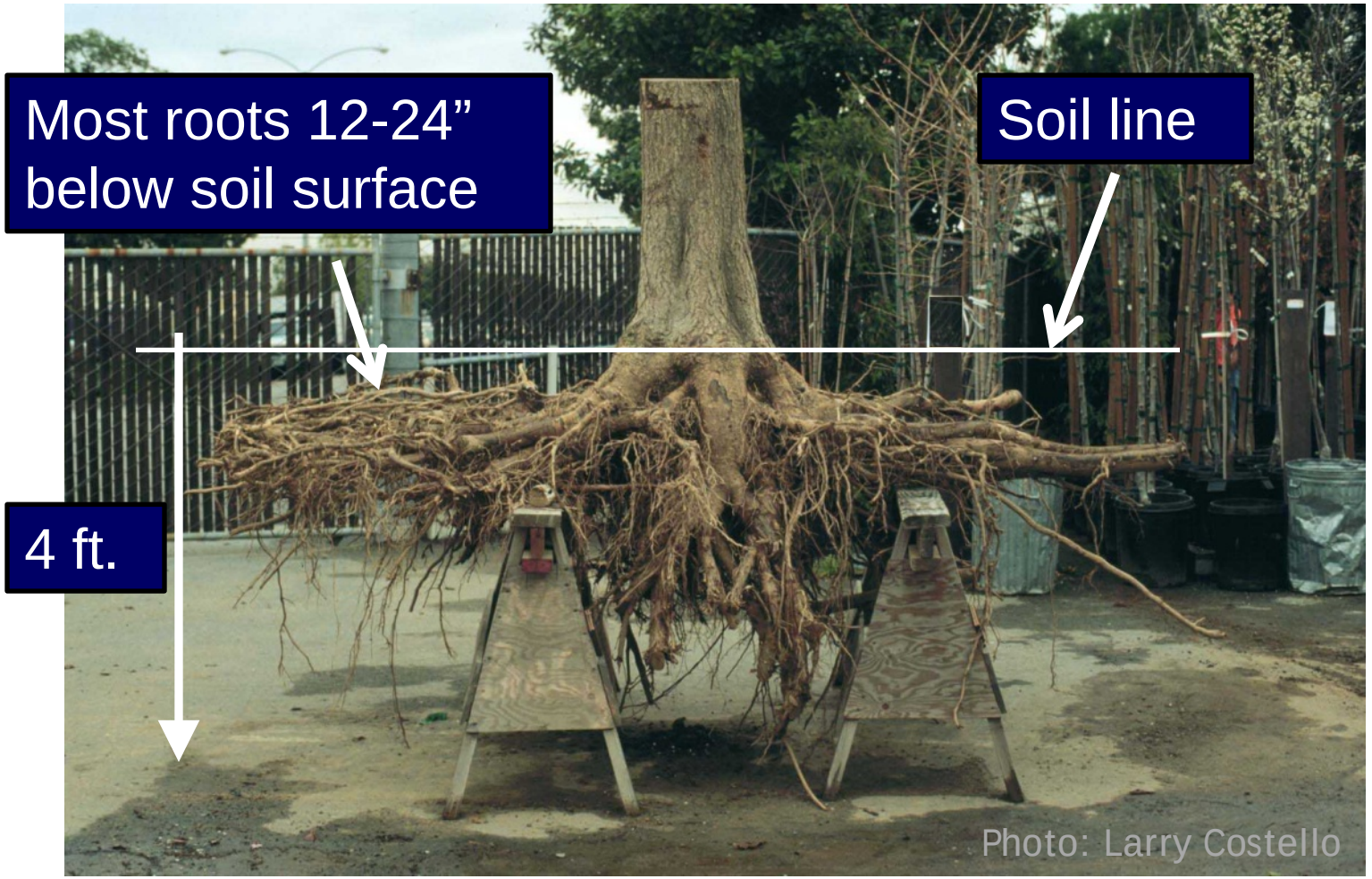
- Deep to 2 -3 feet
- Beneath the canopy
  - Beyond the drip line
  - Not at trunk
- Every 2-4 weeks or more



Graphic adapted from Harris et al. 2004

Mature Gingko Tree

Considered Deep Rooted



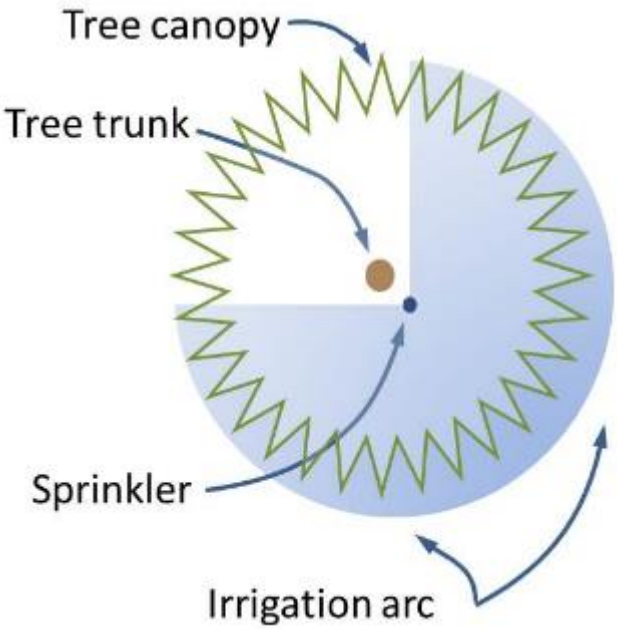
Tree Ring Irrigation Contraption

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

Rotary System Irrigation Contraption

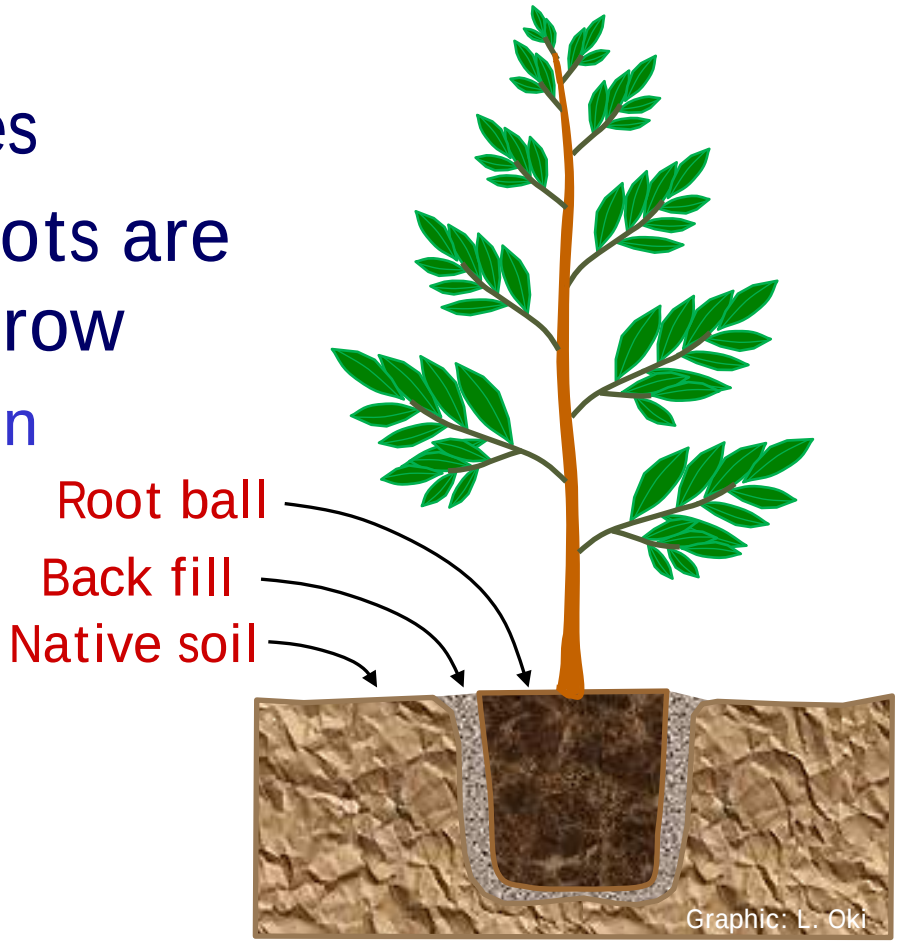
Loren Oki and Dave Fujino



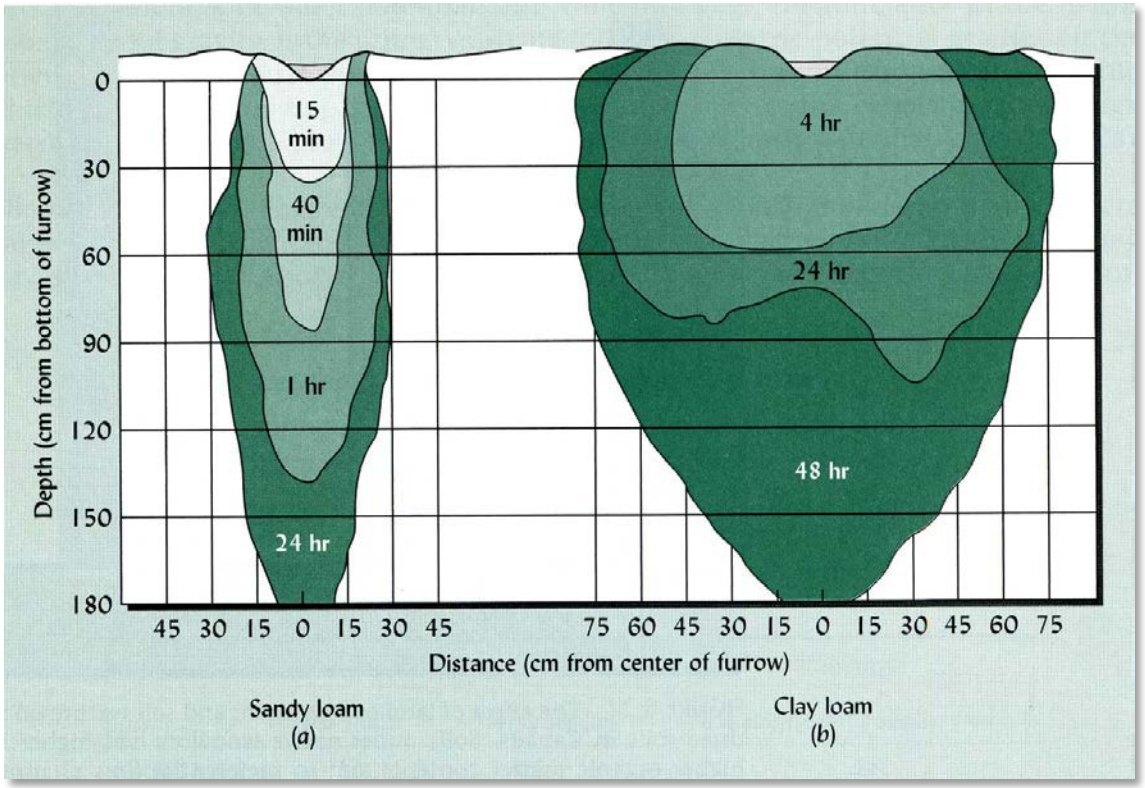
- Low cost ~$20
- Runtime depends on soil type
- http://ccuh.ucdavis.edu/
  - Search: CCUH RSIC

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

Graphic: Brady & Weil, The Nature and Properties of Soils, 2002

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

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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Photo: L.Oki