## IMPACTED TREES

Citrus tree died after irrigation system malfunction

Drought stress on netleaf hackberry with insufficient irrigation

Irrigation emitters left too close to trunk; one not working

Eucalyptus planted on mound with insufficient irrigation died during drought

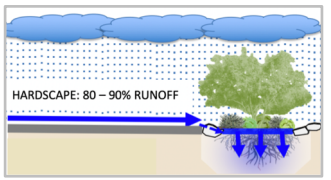
## MANAGING WATER SUPPLIES

Checking irrigation systems can prevent malfunctions

Increase irrigation watering in summer, decrease in winter
Source:https://www.youtube.com/watch?v=IjwJFnB6wj4

Irrigation emitters moved out to tree dripline

Soaker hose placed at dripline to support drought stressed tree. Mulch being added to reduce evaporation from soil




Urban environments yield large volumes of runoff to harvest

Swales retains direct rainfall

Curb cut harvests street runoff

Large-scale green stormwater infrastructure. Photo credit: MRWM Landscape Architects

Combined graywater and roof-top rainwater harvesting. Photo credit: HarvestingRainwater.com

## URBAN TREE THREAT

# Water supply issues

### ISSUES

- Irrigation system issues including malfunctions; wetting trees, need to update timing, volume and emitter locations to meet plant needs
- Ongoing regional drought stressing trees and increasing tree vulnerability to insects, diseases and wildfire
- Increasing pressure to conserve urban potable water use, potentially reducing potable water available to support trees

### MANAGEMENT OF EXISTING TREES

- Periodically inspect and repair irrigation system elements
- Adjust sprinklers to ensure they do not wet tree trunks and leaves
- Adjust irrigation timers seasonally to match tree needs; adjust more often if needed during extreme heat and/or drought periods.
- As trees grow, increase the number of emitters and deliver water to tree's drip zone, or extend watering using soaker hose system
- Provide periodic deep watering based on species needs and weather
- Where potable water supplies are limited, increase collection and infiltration of rainwater, stormwater, graywater and condensate water
- Place organic mulch under tree canopies to reduce evaporation loss

### STRATEGIES FOR NEW TREES

- Design tree-planting areas to provide reliable long-term water supplies to trees, making maximum use of non-potable supplies including:
  - Retaining and infiltrating (rather than deflecting) direct rainfall
  - Harvesting and infiltrating immediate site rainfall runoff
  - Harvesting and infiltrating stormwater from large roofs, parking lots, streets and other hardscapes (Green Stormwater Infrastructure – GSI)
  - Accessing and delivering graywater from inside buildings to outside planting areas, following prescribed requirements
  - Accessing and delivering condensate water from cold-producing machines (air conditioners, ice machines, etc.) to outside planting areas, following prescribed requirements
- Place a tree carefully relative to water harvesting areas to address the tree's tolerance for temporary inundation
- Design, operate and maintain irrigation systems per list above
- Place organic mulch under tree canopies to reduce evaporation loss

**REFERENCE AND RESOURCE WEBSITES - MANAGEMENT OF EXISTING TREES**

- https://www.amwua.org/resource_documents/drip_irrigation_guide.pdf
- https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1392-2016_0.pdf
- https://www.ose.state.nm.us/WUC/PDF/IrrigationBasics2004.pdf
- https://pubs.nmsu.edu/_h/H707/index.html

**REFERENCE AND RESOURCE WEBSITES - STRATEGIES FOR NEW TREES**

- https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1916-2021.pdf
- https://watershedmg.org/learn/resources/GSI
  https://legacy.azdeq.gov/environ/water/permits/download/graybro.pdf
  https://www.ose.state.nm.us/WUC/PDF/NewMexGWGuide.pdf
- https://wrrc.arizona.edu/sites/wrrc.arizona.edu/files/Glawe%20UA%20Condensate%20Powerpoint.Nov-12-14.pdf