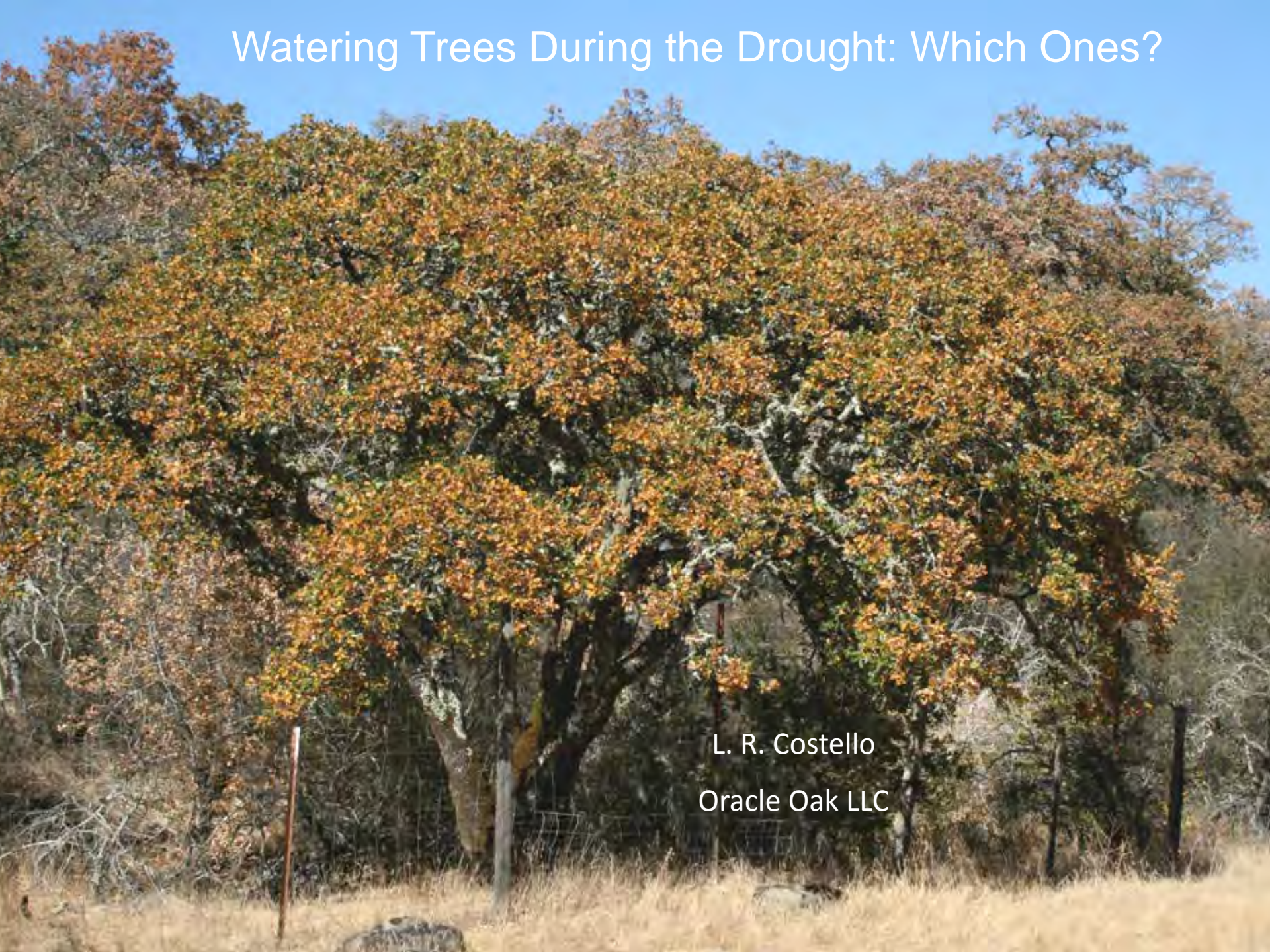


Watering Trees During the Drought: Which Ones?



L. R. Costello
Oracle Oak LLC

Engelmann oak (*Q. engelmannii*)



Many species perform well without summer irrigation

Blue oak (*Q. douglasii*)

San Diego Co.



Sacramento Co.

CA Natives

.... and non-native species





Blackwood
acacia
(*Acacia
melanoxylon*)

$K_c = 0.1$

Chinese pistache
(*Pistache chinensis*)

$K_c = 0.1 - 0.3$





Citrus
(*Citrus spp.*)

$K_c = 0.4 - 0.6$

Trees at Risk: Situations Where Irrigation Should Be Considered

1. Trees in landscapes where water has been withdrawn, e.g., abandoned lawns.



Species with relatively high water needs are most vulnerable

Coast
redwood



Southern
magnolia



Plan to irrigate trees after turf has been removed



2. Species with relatively high water requirements.



White birch

Sensitive species planted in a windy site



Coast redwood

3. Trees planted in restrictive soils





Davis



SSF

All bets are off if significant restrictions to root development exist



San Mateo



Esprit Park, SF

Lots of vegetation in restricted planting areas can lead to water deficits

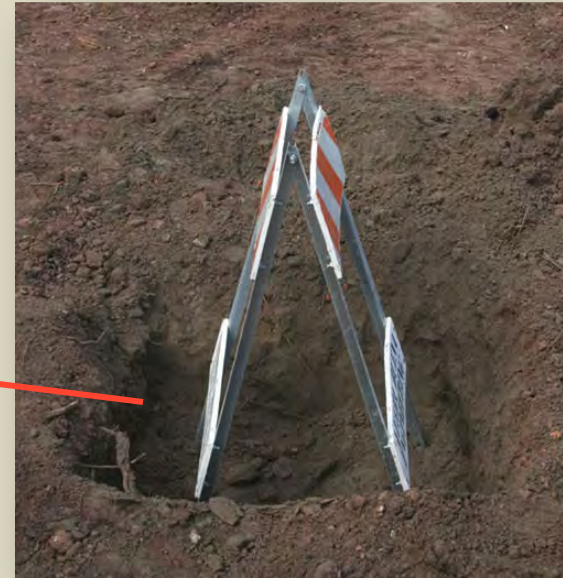


Cork oak (*Quercus suber*)

After summer irrigation



Soil restrictions can vary across small areas



4. Trees that have lost roots: cutting, ripping, crushing, etc.





Root cutting leads to water deficit





Magnolia grandiflora before trenching...



...and 3 months after trenching.



Plenty of cases!



Injury associated with root loss during development can be minimized by irrigation



Irrigation is critical for transplants



Leaf drop after transplanting



...regrowth 3 years later



Photos courtesy of James MacNair



2 years later --- with good water and pest management





5. Newly-planted container stock



Dieback of
recently
planted
hornbeam
(*Carpinus
betulus*
'Fastigiata')





Trouble: trees with large canopies planted in windy locations



Very important to start with good quality stock!



Well-branched root systems are best!



6. Trees in containers



Containers can be found below ground as well



Soil volume is not large enough to retain sufficient water to meet the needs of these London plane trees.





7. Fill soil can reduce water movement into root zone --- leading to water deficits

8. Irrigation may be needed in cases where water has been diverted away from established trees



9. Species prone to water-deficit-induced pest problems may need irrigation





Questions?

Water quality needs to be considered in quantity estimates



Coast Redwood



Lombardy Poplar



Alder



London plane



Birch



They look the same right now, but what will the picture look like in a year or two?

Irrigation objective: hit the target!



Irrigation systems are far from perfect. Pay attention to design, scheduling, and operation.



Don't forget to add mulch!!! Reduces evaporative water loss from soils and competition from weeds.

