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Dealing with Drought



Value of Water

- Yield
- Fruit Size
- Fruit Quality
- Cover Crop Mgmt.
- Erosion Control
- Frost Control
- Pest Mgmt.
- Nutrition Enhancement
- **Tree survival & looks**



Landscape trees survive without water for months

Adapted to drought or getting water from somewhere



Trees where there is some water



Tree getting moisture near creek



5 drought management steps

- 1. Know tree species and water needs - select trees that need/use less water**
- 2. Mulch = save as much soil moisture as possible (no weeds, cover crop or lawn)**
- 3. Check soil moisture about 6-12" deep**
- 4. Irrigate responsibly – slow, deep, periodic – return to # 3**
- 5. Appropriate pruning – don't encourage growth**

1. Know species

<u>Watering Needs For Mature Trees</u>					
Tree/Common	Tree/Botanical	Moderate	Occasional	Infrequent	None
Acacia	<i>Acacia</i>		X	X	X
African Sumac	<i>Rhus</i>	X	X	X	X
Ash	<i>Fraxinus</i>	X	X		
Birch	<i>Betula*</i>	X			
Buckeye	<i>Aesculus</i>		X	X	X
Catalina Ironwood	<i>Lyonothamnus</i>		X		
Cedar	<i>Cedrus</i>	X	X		
Chitalpa	<i>X Chitalpa</i>		X	X	
Crape Myrtle	<i>Lagerstroemia*</i>	X	X		
Cypress	<i>Cupressus</i>		X	X	
Desert Willow	<i>Chilopsis</i>			X	
Elm	<i>Ulmus</i>	X	X		
Eucalyptus	<i>Eucalyptus</i>		X	X	X
Flowering Pear	<i>Pyrus*</i>	X			
Goldenrain Tree	<i>Koelreuteria</i>	X			
Hackberry	<i>Celtis</i>	X	X		
Hawthorn	<i>Crataegus</i>		X	X	
Incense-Cedar	<i>Calocedrus</i>		X		
Laurel, Flowering Fruit Trees	<i>Prunus*</i>	X	X	X	
Loquat	<i>Eriobotrya</i>	X	X		
Madrone, Strawberry Tree	<i>Arbutus</i>		X	X	
Maidenhair Tree	<i>Ginkgo</i>	X	X		
Manzanita	<i>Arctostaphylos</i>	X			
Mountain Willow	<i>Cercocarpus</i>			X	X
Olive	<i>Olea</i>		X	X	X

www.sactree.com

Drought Stressed Maples



Drought Stressed Ash



Drought Stress Borers



Young Redwoods

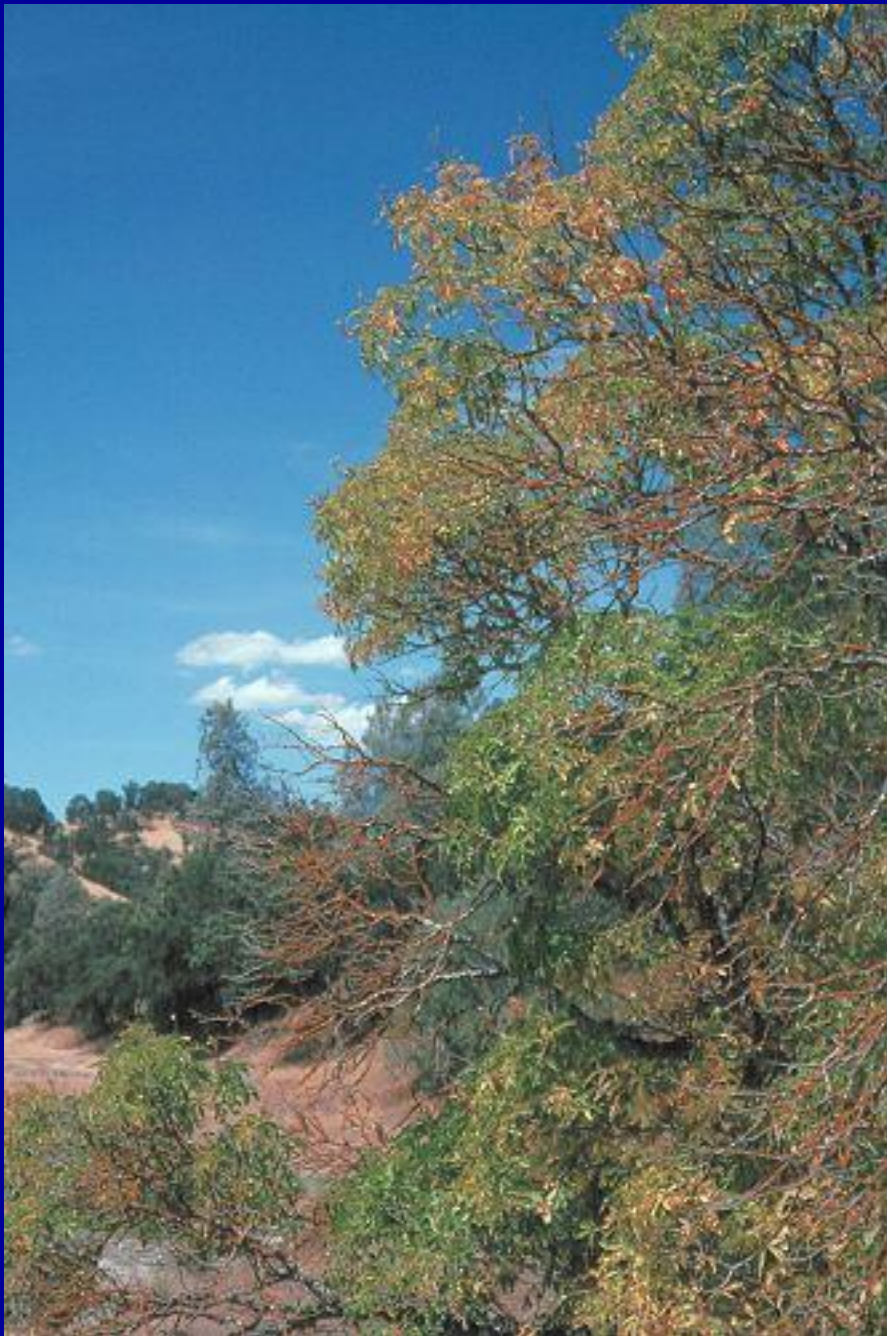


Young Established Oaks



Drought Stressed Live Oak





**Some trees
drop leaves
to survive**

Buckeye

Severe Drought on Olive



Drought - Oak Moth – Root Rot



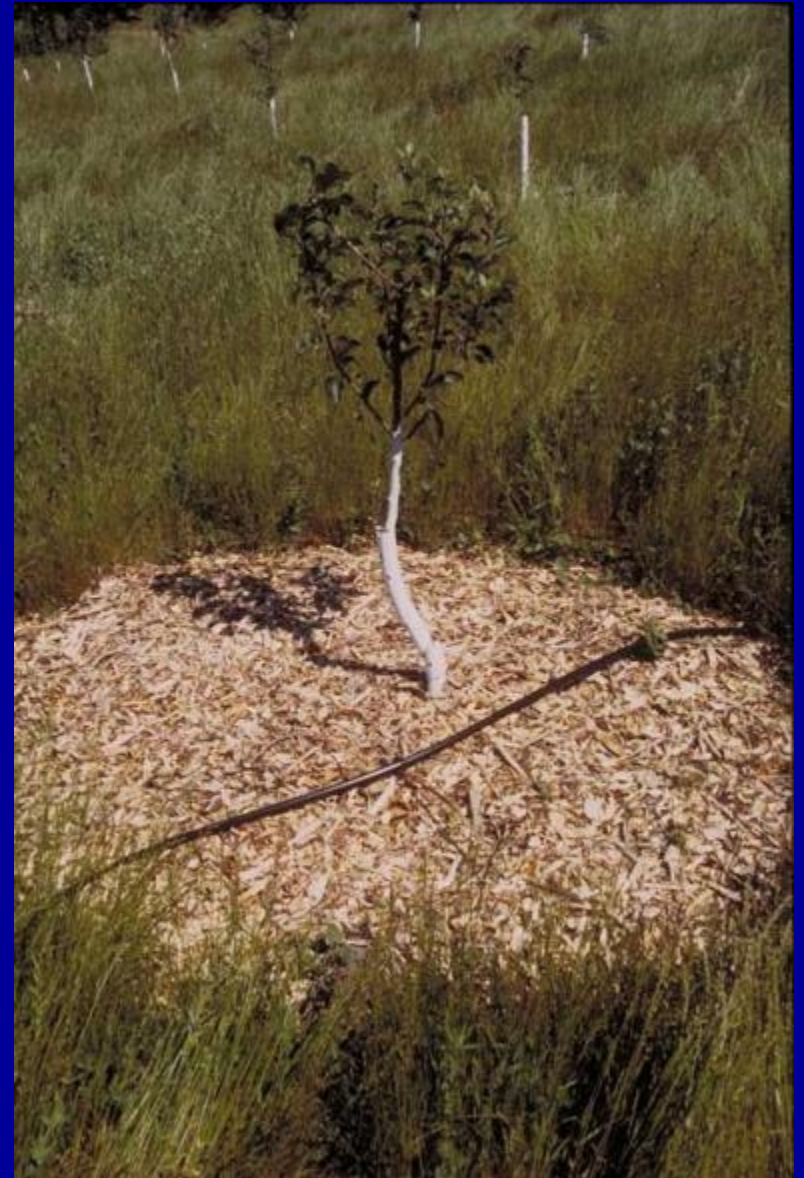
2. Mulch – Mulch - Mulch



Wood Chip Mulch – no weeds



At least - no weeds near trees



Weeds can steal 2" water

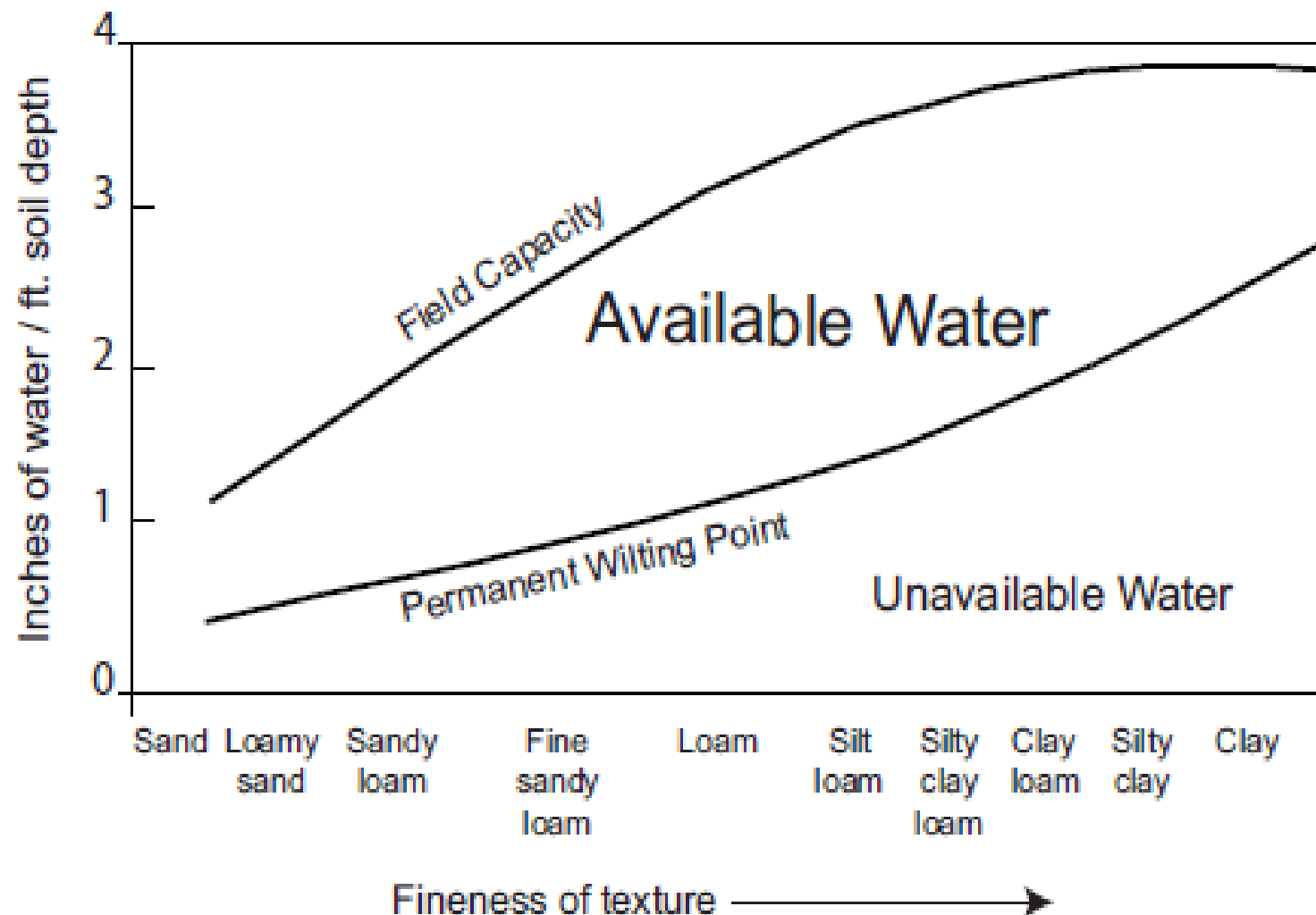


Figure 1. General relationship between soil moisture and texture.
Ohio Agronomy Guide, 14th edition, Bulletin 472-05



**Drought
Stressed
Tree in a
Dry Lawn**

3. Check the soil for moisture



**Look in the area between
6-12 inches deep**

**Soil probably
never gets
completely dry**

**If the soil is
almost dry
(crumbles) = time
to irrigate**

**Couple with
drought
symptoms on the
tree**

Rainfall from Mother Nature

Rainfall 20 – 90” per year

Most of it runs off

Soil Water Holding Capacity

- Clay = 2.0 to 2.5 inches per foot
- Loam = 1.5 to 2.0 inches per foot
- Sand = 1.0 to 1.5 inches per foot

Where are most tree roots?



Soil Profiles



**Most
tree
roots
are in
the top
2 feet
= 4"**



**Deeper in
Very Deep
Soils**

**Holding
6-10" of
water**

Less in Shallow Soils

Holding only 2-3" of water





**Sebastopol soil ~ 2 ft. deep
underlain by impervious clay**

Landscape maple in dry grass



4. Irrigate responsibly

Sprinkler: How long to run?



10 cans – let it
run for 15 min to
1 hour and
measure

Can Test

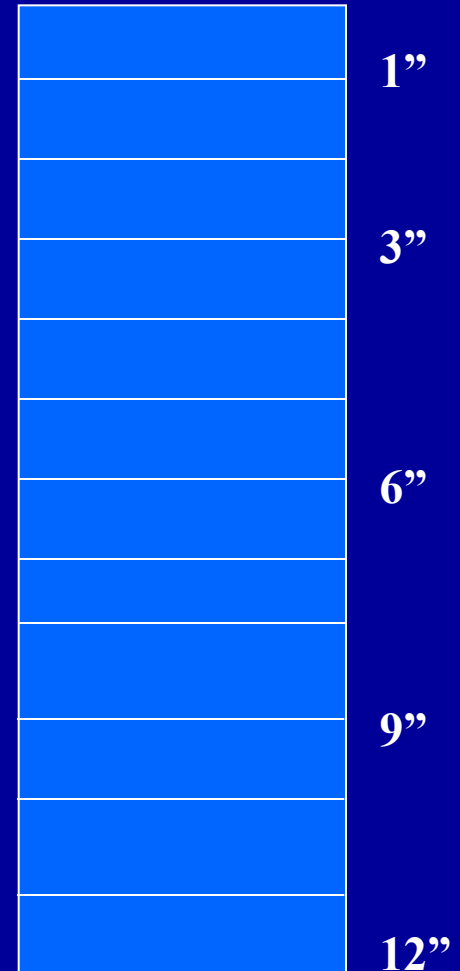


Sprinkler Irrigation

Applying 2.0" of water
soaks down 12" into soil



Rotating impact sprinkler
applies about 0.25 inches per
hour = 2 inches in 8 hours

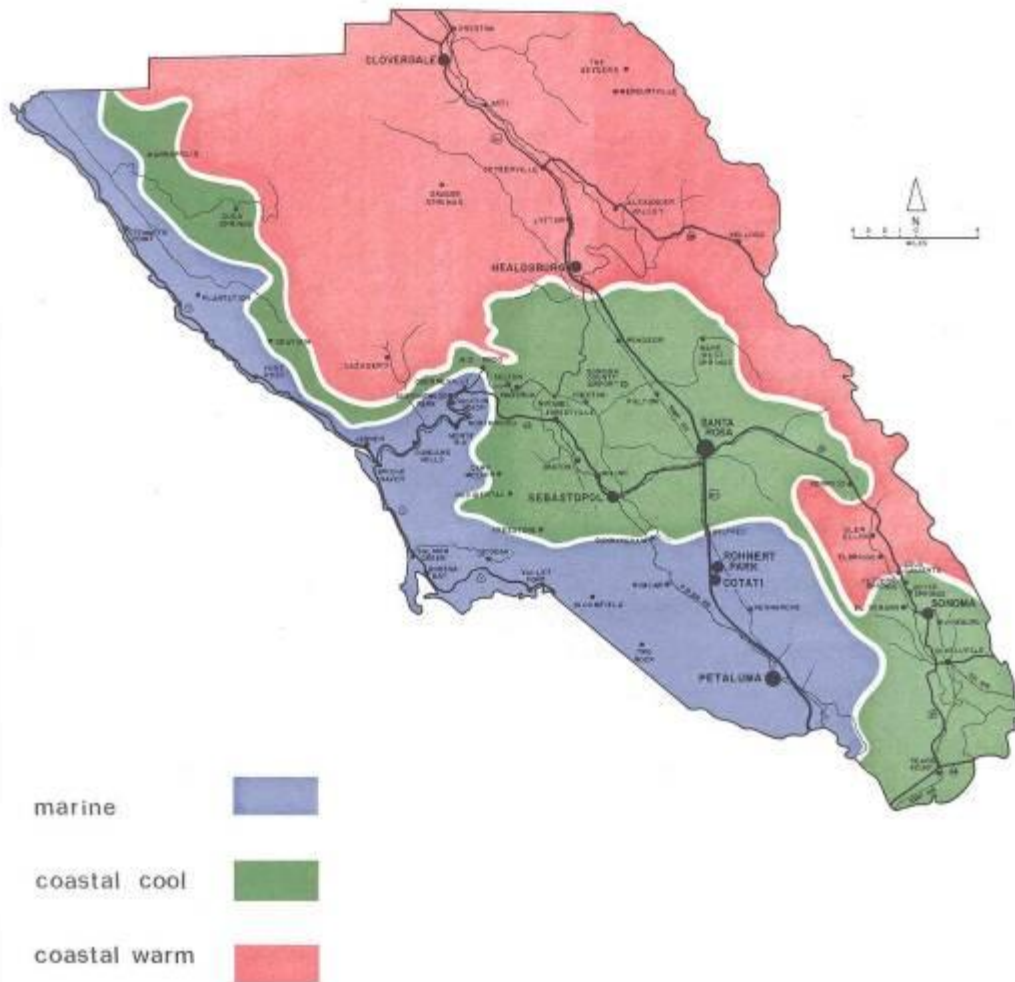


How long does 2 inches of water last?



- Depends on how hot it is
- About 2 weeks during summer heat

SONOMA COUNTY climatic zones



Marine

Coastal Cool

Coastal Warm

Climatic Zones

Marine: Foggy, windy, cool

- 2,185 degree days (1,800-2,800)
- Water use ~ 20-22"

Coastal Cool: Intermediate – some fog

- 2,582 degree days (1,900-3,600)
- Water use ~ 30-34"

Coastal Warm: Warm – little fog

- 2,920 degree days (2,100-4,200)
- Water use ~ 36-42"

Drip Irrigation – one gallon of water soaks down about 6-12”

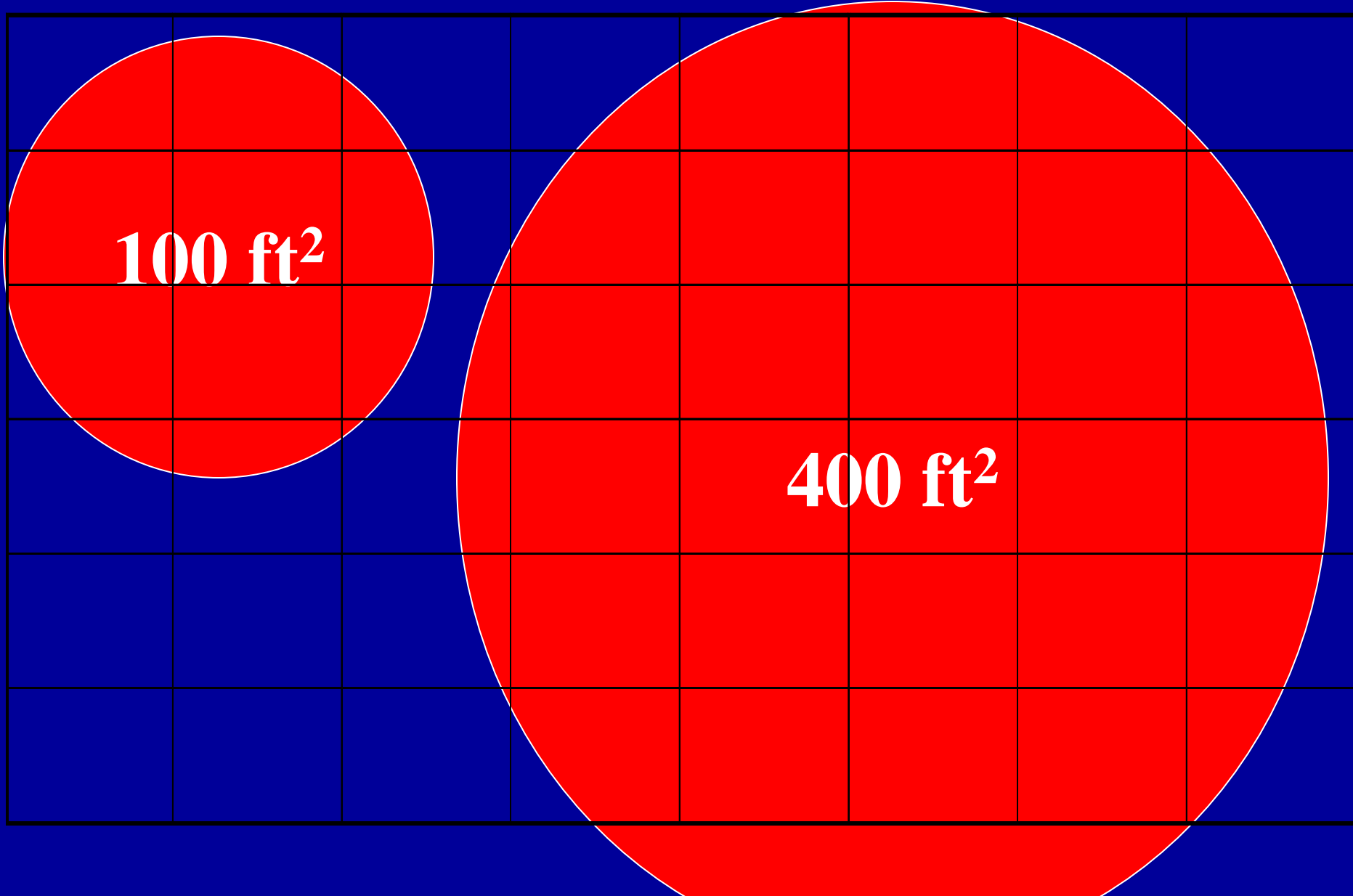


BUT . . . Its not much water and it does not last very long

On a hot summer day (30% ETo for tree survival):

- 100 ft² (10 x 10 ft.) tree = 5 gallons/day
- 200 ft² (14 x 14 ft.) tree = 10 gallons/day
- 300 ft² (17 x 17 ft.) tree = 15 gallons/day
- 400 ft² (20 x 20 ft.) tree = 20 gallons/day

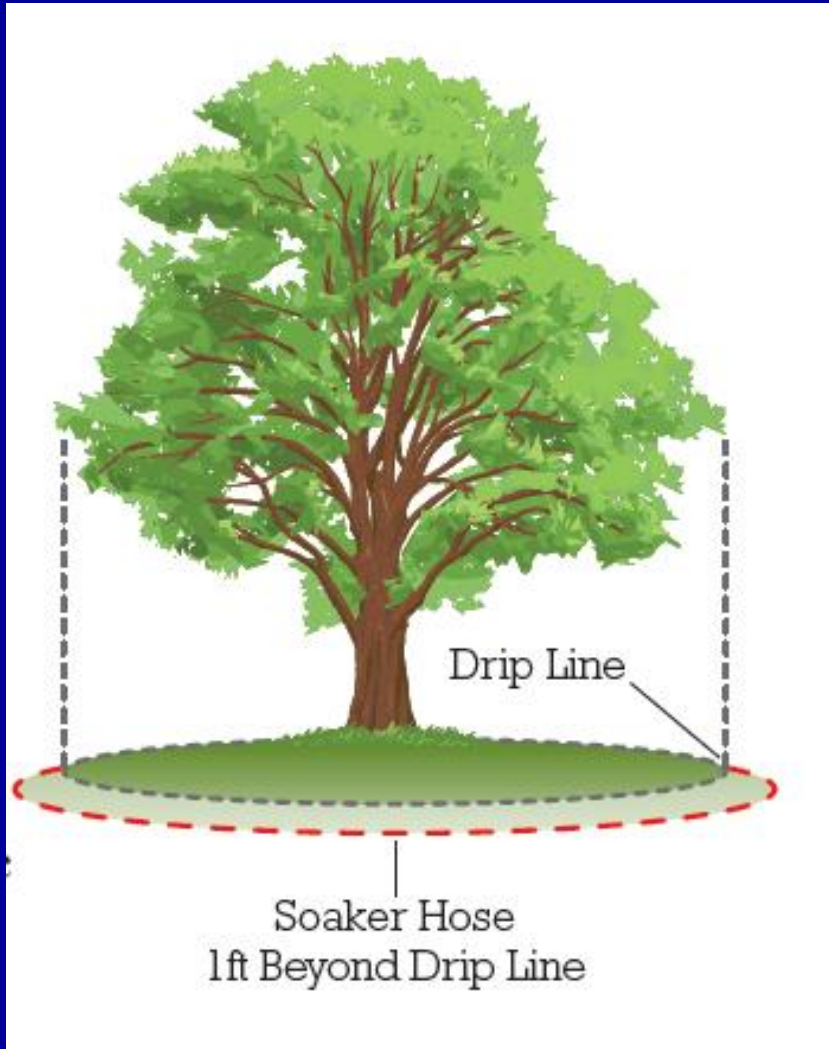
Area Covered in ft²



Emitter – too close



Drip line or soaker hose – at or just beyond drip line



Soak the
tree and
then let it
dry out

**Young trees need about 10
gallons per week in summer**



**Do not
keep
landscape
trees
constantly
wet**

5. No Heavy Dormant Topping



Summer pruning reduces foliage



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California Drought Resources

As we enter 2014 in the midst of historic drought, California's academic institutions serve as a tremendous resource both in offering everything from near-term management advice to farmers and ranchers to the innovative work being carried out by researchers on a vast array of issues from drought resistant crops to snow sensors to climate change.

These pages are being continuously updated as we work to bring the resources of the state's universities and colleges to a broad range of communities.

- [Drought-related events](#)
- [Drought information and resources](#)
- [Drought experts list](#)
- [Media coverage featuring our experts](#)
- [Story highlights](#)



http://ciwr.ucanr.edu/California_Drought_Expertise/



Plant

Shade trees. At your home. In local parks. In open spaces.

Volunteer

Get dirty. Be our eyes and ears. Harvest acorns.

Learn

How-to. Tree guide. Tree care. Advocate.

Join

Donate. Become a member. Support.

**Donate
Now!**

SEARCH

Learn

Learn to plant and maintain strong, healthy trees that will thrive for generations.

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Before you Plant

How to Plant

Tree Care

Dry Winter Tree Care Tips

Caring for Young Trees During a Drought

Caring for Mature Trees During A Drought

Young Tree Care

Mature Tree Care

Seasonal Tree Care Tips

Teach Kids About Our Urban Forest

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Dry Winter Tree Care Tips

Even though trees slow their growth or go dormant in the winter, it is necessary to have water in the surrounding soil as water absorption and nutrient storage still takes place in the roots.

Without rain, the entire tree may die when roots don't receive adequate moisture.

Here are some tips for young tree care in the winter months. Download our [Tips for Drought Care](#) and share with your gardener.

- **Check to see that the tree is still alive**

If there are no green leaves, bend the branches. If they are flexible, there is still moisture in the stem. Make a small scratch in the trunk of the tree. If it is green just under the bark, the tree is still alive.

- **Check to see if the soil is moist**

Place a shovel, small spade or a screw driver into the soil away from the rootball to a depth of about 6-8". Feel the soil. Usually in the winter it is sticky because of the rains. If it feels dry and crumbly add additional water. Moist soil will absorb more of the sun's heat than dry soil and will radiate a small amount of heat during the night.

- **Give adequate water**

Thanks! – Questions?

