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Sustainable Landscapes

Sustainability

"meeting the needs of today's population without diminishing the ability of future populations to meet their needs."

Sustainable Landscapes

- Incorporate plants suited for the climate
- Conserve water
- Nurture and protect soil
- Prevent/reduce pest problems
- Conserve energy/reduce Pollution
- Encourage wildlife

Why Garden Sustainably?

Save

Money

Improve
Garden Health

Protect

Water Quality
and

Wildlife

***Sustainable Landscaping*……**

Leaves a greener footprint for our children's children

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Select plants recommended for your *Sunset Zone*

And Microclimate (shade, etc.)

What Is Your Climate Zone?

- Best to Use Your Sunset Zone Instead of a USDA Zone (they are smaller and capture the specific aspects of your climate better)
- Do you know Your Sunset Zone?

Sunset Zones In San Bernardino County

7: Lake Arrowhead
10: Victorville
11: Barstow
18: Chino, Ontario, Redlands
19: Rancho Cucamonga, Pomona

Sunset's New 'Plantfinder' Can Help You Find The Perfect Plant!

Http://Plantfinder.Sunset.Com

- Searchable By Zone And Other Criteria
  - Deciduous vs Evergreen
  - Size
  - Flower Color
  - Etc.

Let’s Look At An Example For Zone 18

Criteria entered into PlantFinder: evergreen, tree, 20’ tall, 15’ wide, low water use

- Toyon (*Heteromelos arbutifolia*)
- Triangle Palm (*Dypsis decaryi*
- Jujube (*Ziziphus jujuba*)

Toyon

Triangle Palm

Jujube

Microclimates Impact Plant Health and Water Use

Microclimate (Smaller Climate Within a Climate Zone) Impacts Plant Performance

- Sun vs Shade
- Poor Soil
- Wind
- Etc.

Water Needs of the Same Species Vary Depending on Microclimate

- Landscape plants in heat islands require up to 50% more water than the same species in park settings

Shade Vs Full Sun

Most Plant Problems are Caused by Poor Watering Practices and poor Soil Quality

Water Management

- Promoting proper irrigation design and management is the single most important tool to ensure quality plantings

- Irrigation scheduling, hydrozoning, and proper use and placement of mulches are important aspects of water management

Landscape Tree Irrigation

- Most landscape trees require at least some water throughout their establishment period

- Properly scheduling irrigations based on reference evapotranspiration (ETo) and applying the water into the root zone are important practices

Water Needs increase in Heat Islands

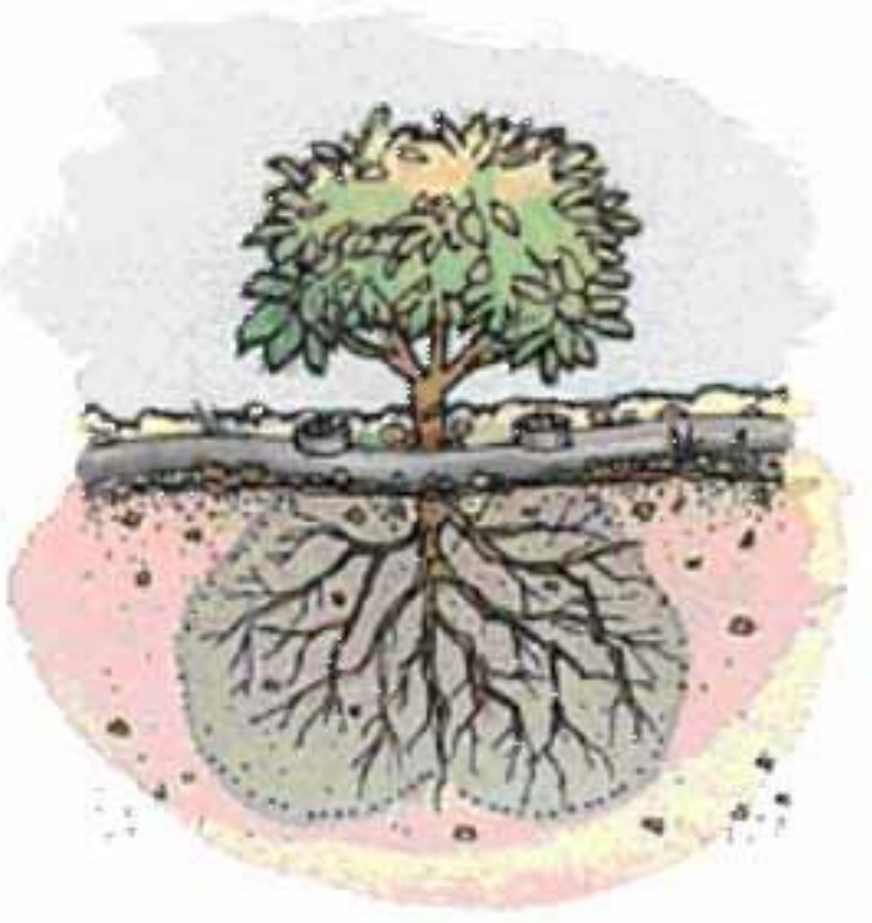
- Landscape plants in heat islands require up to 50% more water than the same species in park settings

Sustainable Landscapes
Conserve Water Through:

1. Hydrozoning
2. Scheduling irrigations based on plant needs
3. Making sure sprinklers/drip systems work properly
4. Using mulch and soil amendments effectively

Hydrozone : Place plants with similar water needs together and irrigate them accordingly

Drip Irrigate Trees, Shrubs, and Gardens to Reduce Soil Evaporation and to Apply Water Directly into Root Zones



Warm-Season Lawns (Bermuda) Use Less Water than Cool-season Lawns (Tall Fescue)

Lawn Watering Guide for California

http://ucanr.org/freepubs/docs/8044.pdf

To prevent water waste and brown spots in turf and groundcovers, repair leaks, low heads, broken sprinklers, unmatched sprinklers and pressure and spacing problems

If you Keep your Lawn, *Grasscycle!*

- **Saves time/money**
- **Adds organic matter to lawn**
- **Recycles nutrients**
- **Reduces greenwaste in landfills**

Lawn Alternatives

- **Woolly Thyme** (*Thymus pseudolanuginosus*)
  - low growing (2”)
  - soft, fragrant lawn
  - drought resistant
  - cold-tolerant

Lawn Alternatives (Con'd)

- Blue fescue (*Festuca ovina glauca)*
  - Drought-resistant
  - Striking blue evergreen
  - Grows to 6" tall

CA Natives for Lawn Replacement

- *Ceanothus maritimus* (native to San Luis Obispo County)
  - Tolerates clay soil
  - Blue flowers
  - Low-growing, spreading

Lawn Alternatives (Con'd)

- *Vancouveria hexandra* (Inside-out Flower)
  - Takes some shade
  - Shortly deciduous
  - Somewhat drought resistant once established

Water cycling may be necessary to avoid run-off. Divide the total amount of water required per day into 2-4 cycles. Apply water as close to initial event as possible before soil dries out.

Irrigate Deeply and Infrequently and Monitor Soil Moisture

Soil probe

Soil sampling tube

Other Methods to Conserve Water in the Landscape

Minimize the use of water to clean sidewalks and driveways

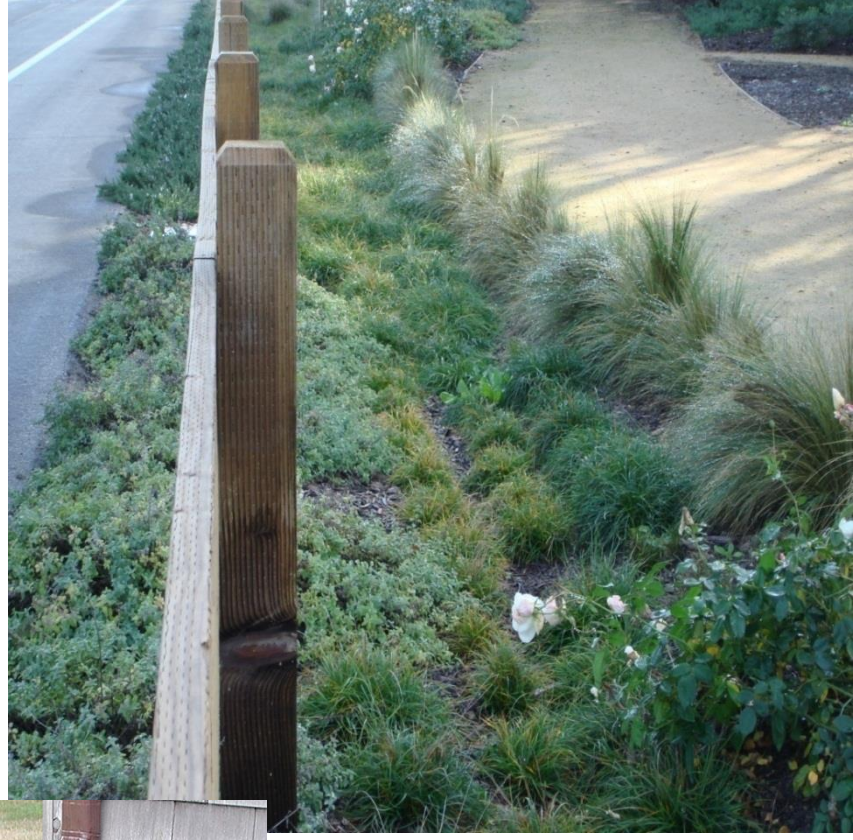
Remove weeds that compete with landscape plants for water

Improve Water-Holding Capacity and/or Drainage with Compost Mixed Evenly into Soil (6” – 1’)

Don’t Let Water Get Away!

Permeable surfaces

Infiltration Basins

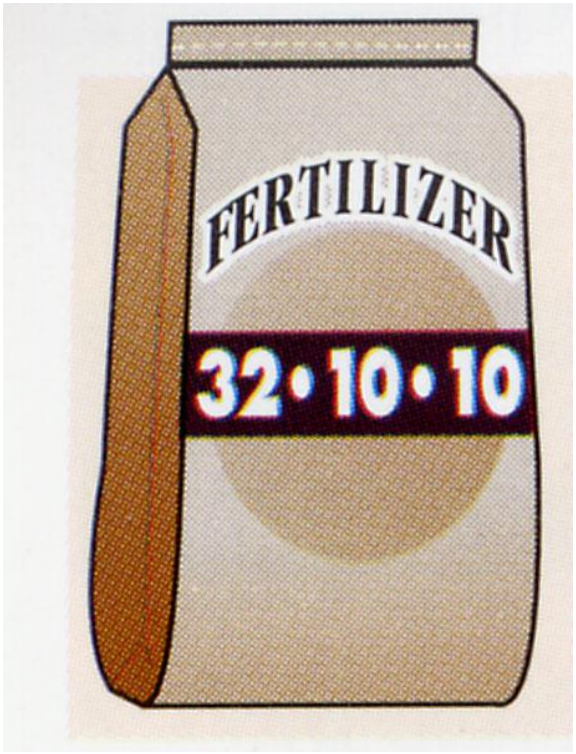


Water Collection

Apply Mulch Around Plants

Mulch Conserves Water and Beautifies Landscapes

Avoid Over-fertilizing



- Creates flushes of weak growth
- Increases water requirement

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Root Functions

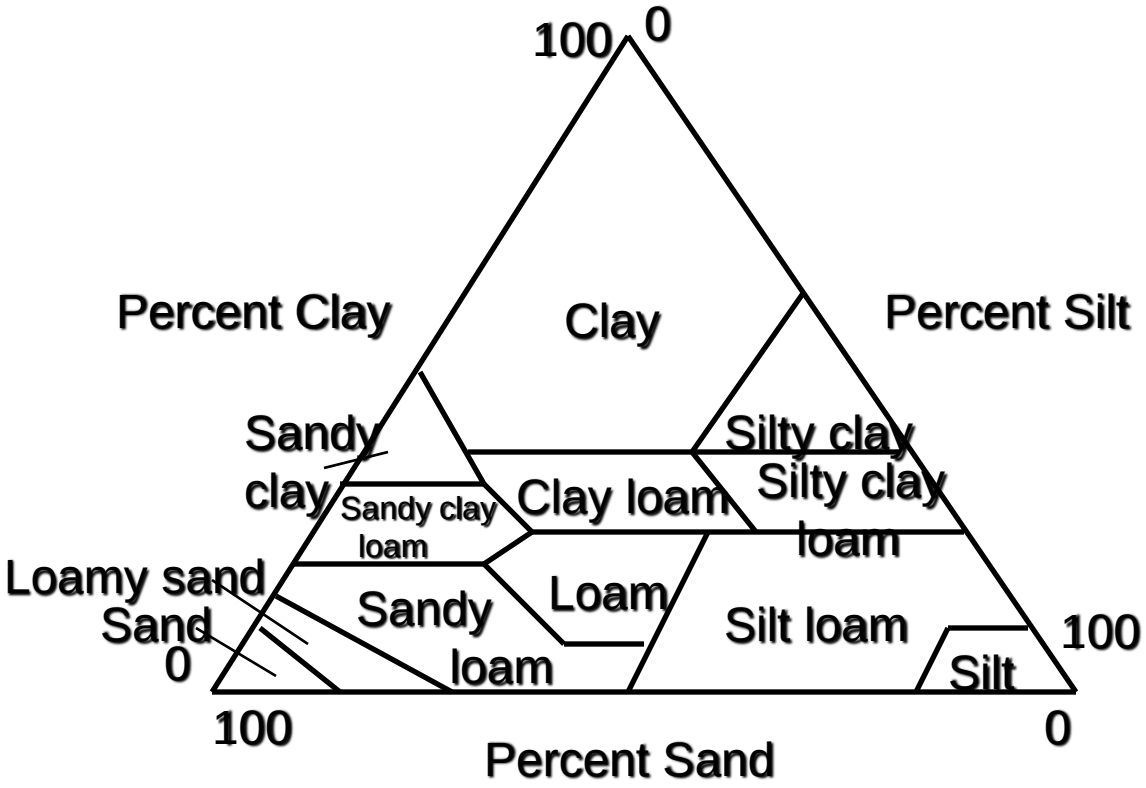
- Absorb water and nutrients
- Provide stability
- Synthesize plant hormones
- Store energy produced by plant

Important Aspects of Soils

- Soil Texture
- Soil pH
- Soil Compaction (construction/traffic)
- Effective Rooting Depth and Volume
- Drainage and Aeration

Soil Texture

Amount of Sand, Silt and Clay in a Soil



SERVICE

Poor Drainage and Suffocated Roots

Keep construction activities away from tree planting sites!

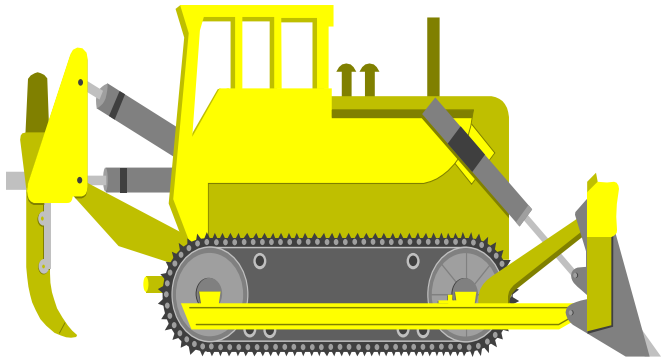
Effects of Compaction on Soil

- Soil structure is destroyed
- Soil drains slowly and is often anaerobic
- Compacted soil physically impedes root growth and results in the containerization of roots

Root Growth in Compacted Soil

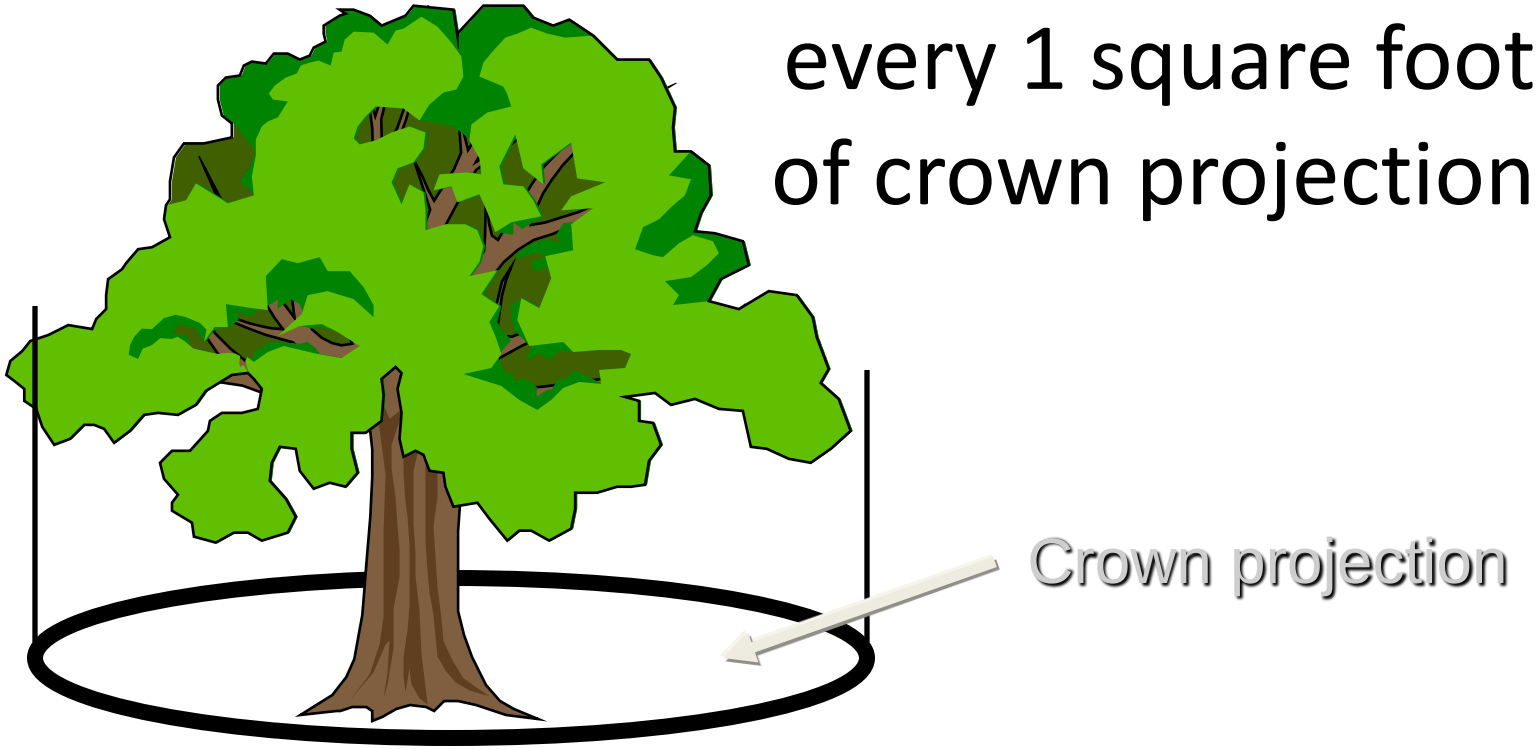
Soil Compaction and Construction

- Soil structure is slow to form, but quick to destroy
- The first pass of heavy machinery causes the most damage
- Plan ahead to preserve soil structure



How Much Soil Does a Tree Need?

2 cubic feet of soil for every 1 square foot of crown projection

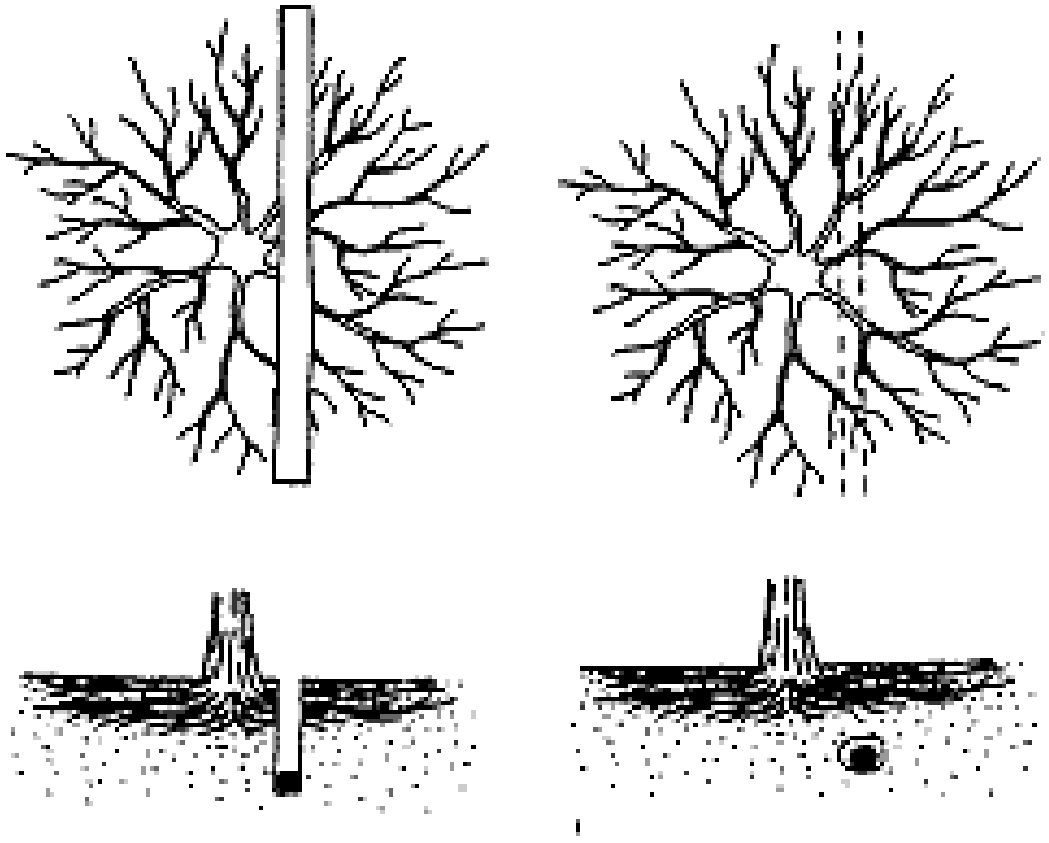


Indications of Plant Stress From Soil Compaction

- Small, scorched or off-color foliage
- Early fall color or leaf drop
- Tip dieback
- Presence of insects or disease
- Suckering from the trunk

Avoid Trenching Near Roots

Tunnel Rather than Trench



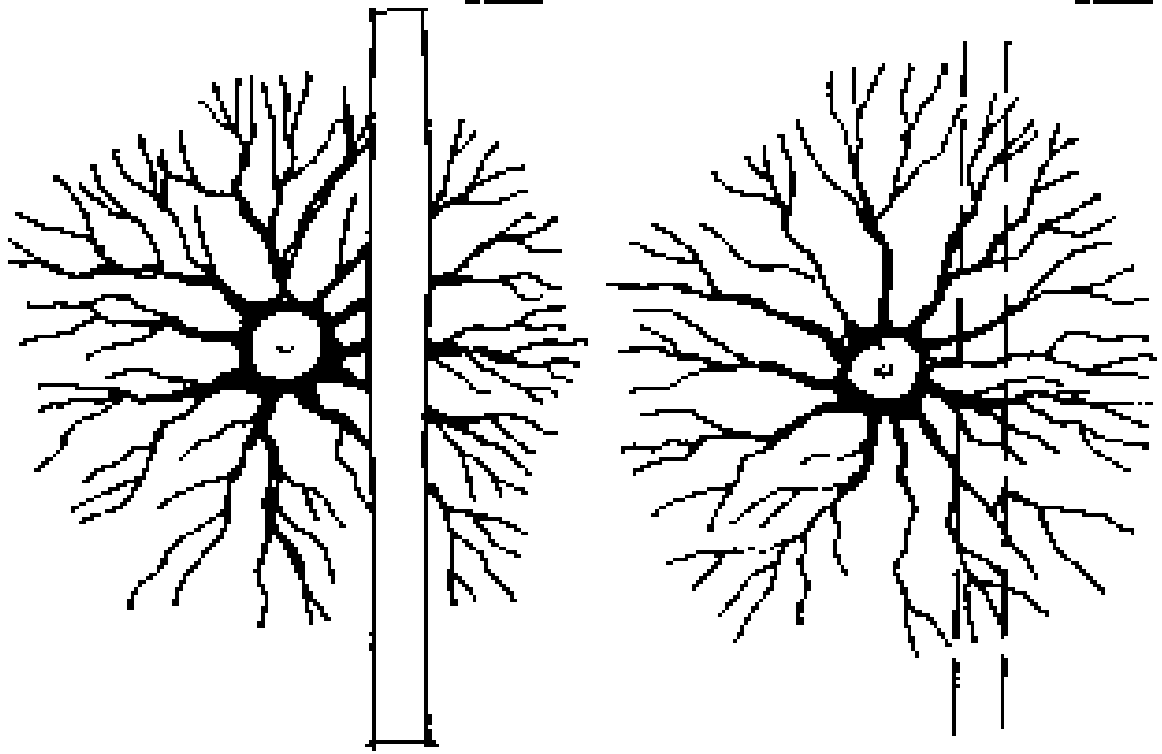
- Trenching near a tree can kill large numbers of roots. A tunnel in the same place will do virtually no damage to the tree.

Trench

40% Root Kill

Tunnel

No Root Kill



Trenching vs Tunneling

Tunneling to Preserve Roots

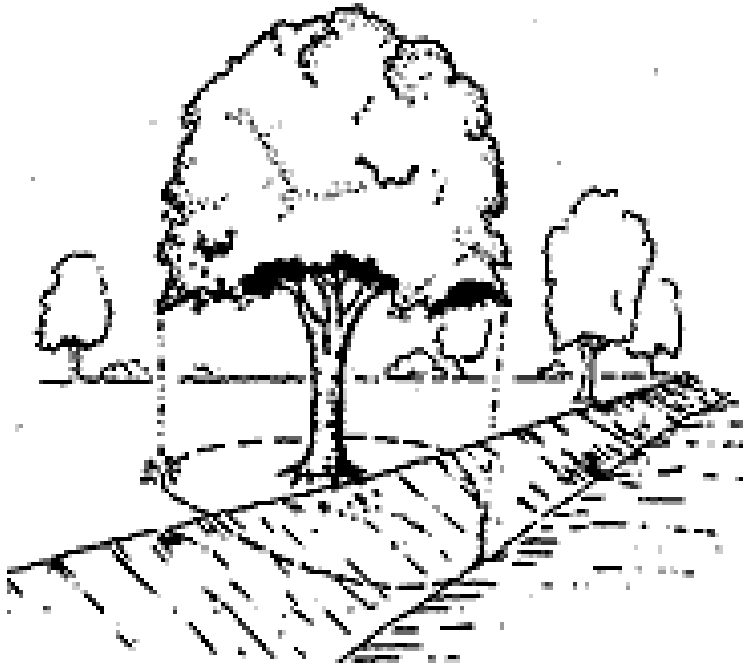
- Tunneling a minimum of 2 feet deep is often deep enough, but 3 to 4 feet deep is preferred.

- Tunnel a minimum of 1 to 2 feet away from the trunk (one inch DBH = 1’ out). For trees under 6 inches in diameter at breast height, trenching should come no closer than the dripline of the tree.

Avoid Grade Changes

- Be cautious when removing (cutting) soil around a tree. A large portion of the root system may be dislodged. Avoid cutting within the dripline and construct a retaining wall at or beyond the dripline to preserve roots

This change in grade has killed half of the roots. Most trees will die from this extent of injury.



Avoid Damaging Bark and Trunk

- Often the bark may be damaged along the trunk or major limbs. If that happens, remove the loose bark. Jagged edges can be cut away with a sharp knife. Take care not to cut into living tissues.

More Trunk Injury

Root Flare in the Forest

- Root flare is a positive indication of a tree growing into a stable mature specimen.
- Note the abundant flare at the base of all these trees

Curb Uplifted by Root Flare

- Curb was destroyed by roots expanding in diameter
- Most communities cut roots and replace the curb instead of allowing trees to grow and remain healthy
- We need to be more creative than this

Close Up of Last Photograph

- Most of the root system was cut when the sidewalk was repaired

Also, Prevent Soil Erosion by Plantings on Slopes

- Prevents loss of valuable soil

- Prevents landslides and property losses

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- Use Integrated Pest Management (IPM) to prevent/reduce pest problems
- Encourage beneficial insects/microbes
- Use pesticides only as a last resort (and never in food gardens)

Attract and Protect Your Beneficial Partners

No Bugs = No Birds

Integrated Pest Management Stresses Use of Recommended Planting and Maintenance Practices to Prevent the Need for Pesticides

- Proper Plant Selection for climate
- Proper planting technique
- Proper amount of water and fertilizer
- Proper tree pruning
- Etc.

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Fertilizers

Synthetic, Slow Release

- Slower, longer lasting
- More expensive but more forgiving of uneven application
- Less potential for groundwater pollution
- Polymer coating breaks down slowly with water

Fertilizers

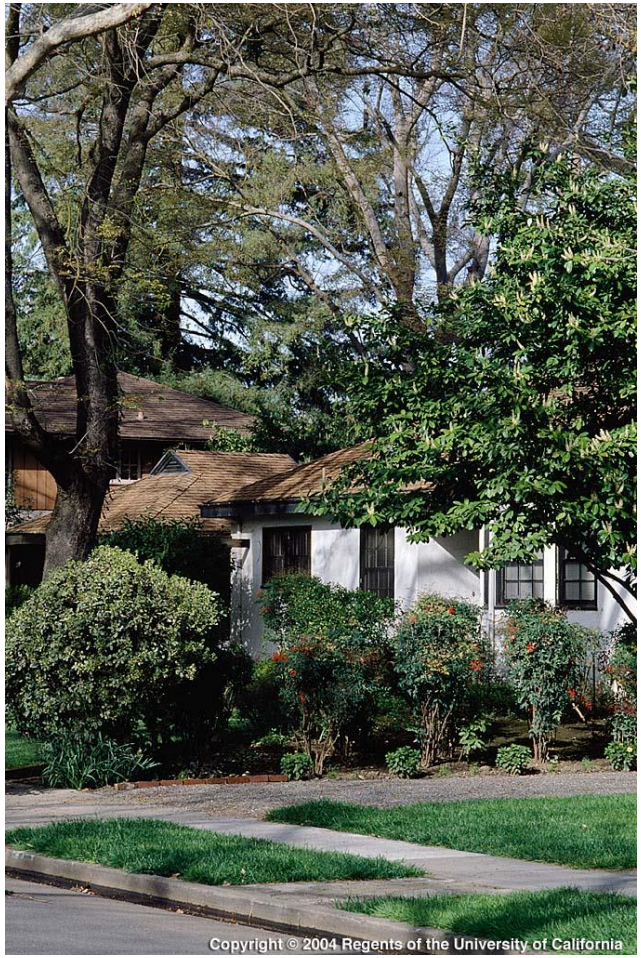
Organic

- Slower nutrient release
- Bulkier, harder to transport & store
- Re-use of a waste product
- Are they better to use?
  - Philosophical differences
  - Lighter carbon footprint?

A Sustainable Landscaper Conserves Energy By….

- Placing plants strategically to reduce your home's energy needs
- Reducing reliance on petroleum products
  - Maintaining machines/use non-gas machines
  - Fertilizing only when necessary
  - Growing his/her own food
  - Buying locally grown plants
  - Reducing, reusing, recycling

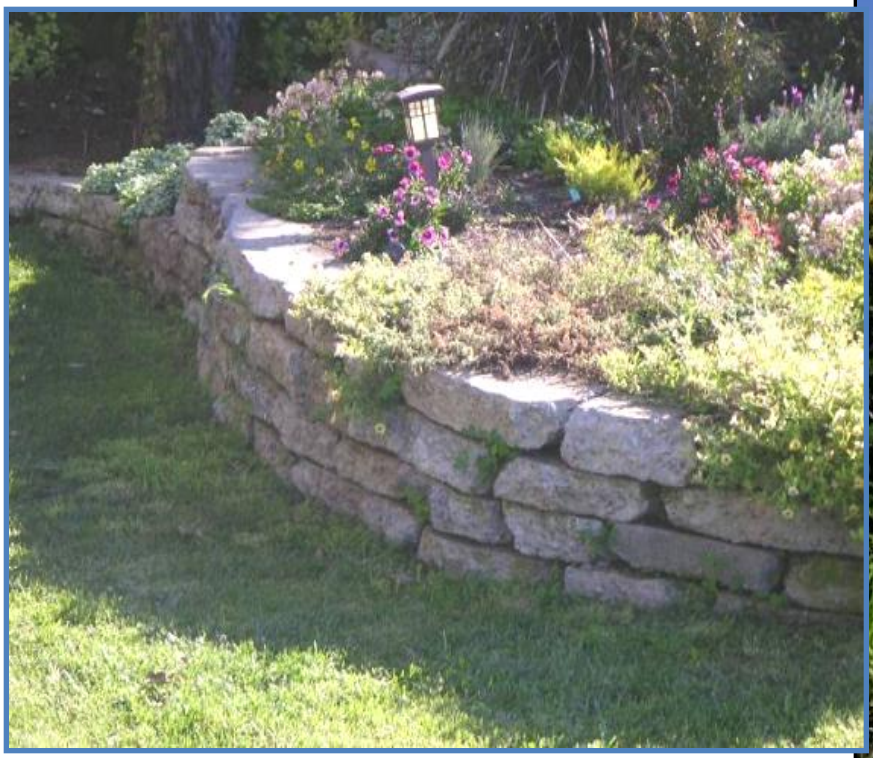
Shade

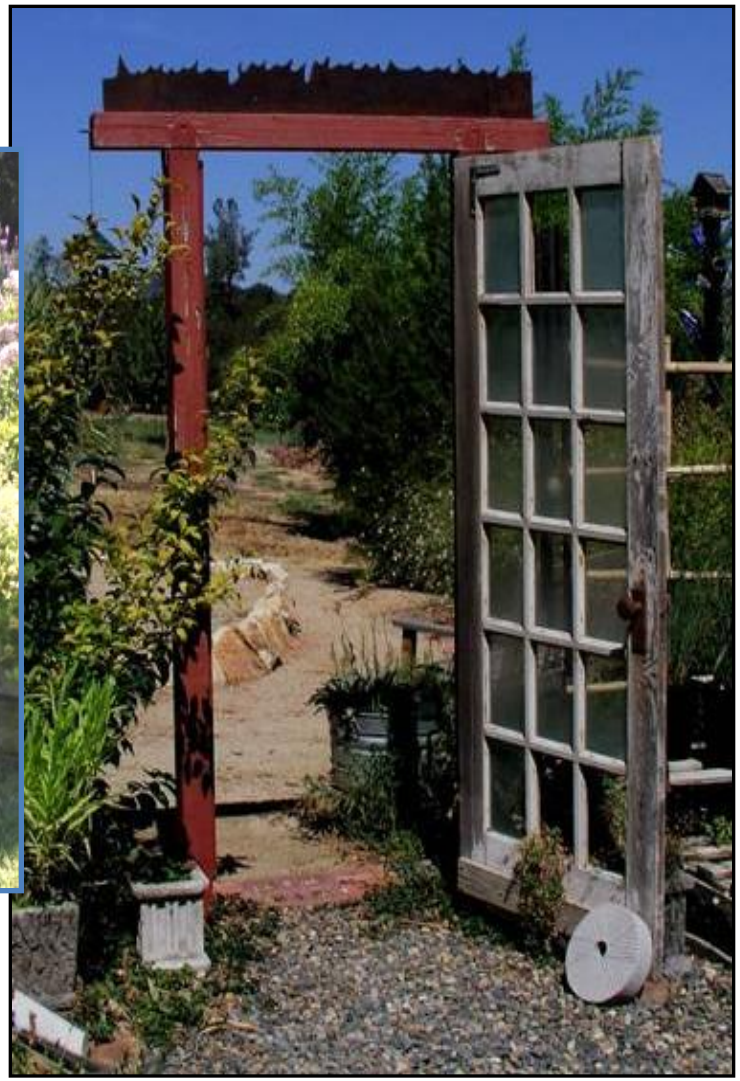


- Trees can reduce air temperatures as much as 9°F
- Temperatures directly under trees can be as much as 25°F cooler than air temperatures above nearby blacktop

Compost! Recycle Greenwaste on Site

Reuse Construction Materials





Sustainable Landscape Practices that Save Energy

1. Planting to reduce seasonal temperature changes
2. Reducing waste and recycling materials
3. Keeping greenwaste on site
4. Nurturing healthy soils while reducing fertilizer use
5. Conserving water and topsoil
6. Using IPM to minimize chemical use
7. Reducing runoff

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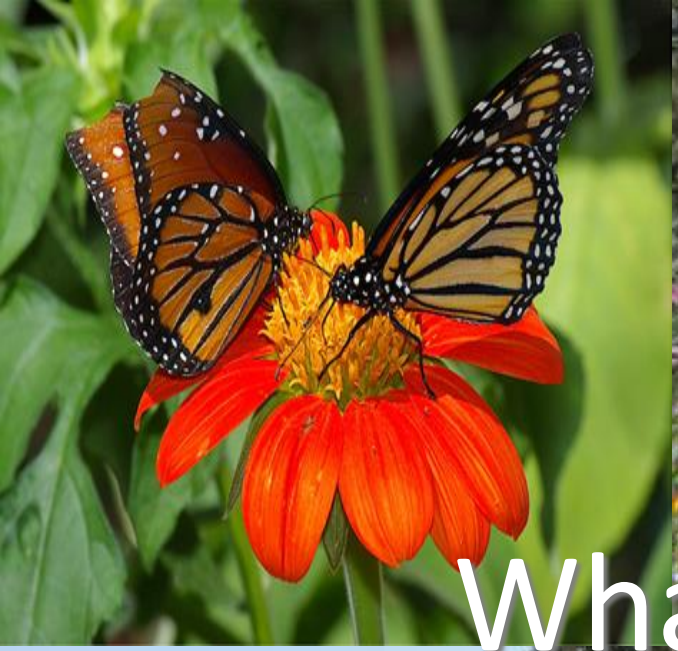
Sustainable Landscapes Encourage Wildlife by….

- Reflecting native habitat in the garden
- Choosing wildlife friendly plants
- Providing food, water and shelter



What can we do?

The Four Basic Wildlife Needs: Food, Water, Cover and Space

Ten Tips for Landscaping for Wildlife

1. **Limit the Amount of Lawn** because grass offers less food and cover for most wildlife than other plants

2. **Increase Vertical Layering** between the ground and the tree canopy

3. **Provide Water** because it is essential for wildlife survival

4. **Plant Native Vegetation** whenever possible because it will attract indigenous wildlife species

5. **Provide Bird/Bat Houses and Bird Feeders** to increase the diversity of wildlife attracted to your yard

7. **Remove Invasive Exotic Plants** that take over natural habitats and can replace all the native vegetation

8. **Manage Pets to protect wildlife and themselves.** Cats are good hunters and kill millions of birds and other small animals each year.

9. **Reduce Pesticide Use** to prevent unnecessary wildlife illness, deaths, and lack of diversity

10. **Expand the Scale of Habitat** by working with your neighbors to create larger wildlife habitat patches

To Review…
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Can You Make One Change?

Questions???