

# Propagation Notes CNPS

Patricia Evans, Natural Landscape Design, 650-949-2801

## Starting Cuttings

### Taking cuttings

Choose tip shoots on top or vigorously growing side of plant in light

Shoot from back of plant will not root as well

You should be able to bend cutting but it should spring back, if it stays bent, it is too green. If it doesn't bend, it is too hard

### Preparing cuttings

Start with 2-6" piece cut just above node

Generally, roots come out all along stem, not just at nodes

Remove bottom leaves and keep at least 2 sets of leaves

Tips without flowers are MUCH better than tips with flowers

Cut large leaves in half or remove some of leaves on large leafed plants

Hardwood cuttings in fall need to be wounded. Pound with a mallet or scrape one side of bottom of cutting until see green (Don't do it all the way around the stem)

### Rooting hormone

Put in Dip n Grow rooting hormone from Wegman's for 3 seconds.

Dilute to 1:10 for softwood cuttings and 1:5 for hardwood

Powder tends to clump and get scraped off when insert in medium, Gels can't be diluted

### Planting cuttings

Use mix of peat and perlite in 1:5 ratio

Peat is acidic (deters pathogens) and retains some moisture

Fill nursery flats or 4" pots (5-9 cuttings in each pot). Gallon pots are too deep

Make a pre hole with a pencil for soft cuttings, insert cutting 1 1/2" and be sure there is room beneath cuttings, press medium down snugly and water well

### Put cuttings in closed container for a while to retain moisture

Can use plastic freezer bags left partly open or clear plastic box

Mist the cuttings twice daily (watered, but not be soggy), softer cuttings need more moisture

Place on shady side of building without any direct light and leave until spring

### Don't check cuttings too soon

Pop whole mass of medium out to check

### Pot it up when get a few roots (3-4 at least)

Generally use 4" pots unless the root ball is really large and vigorous

Pot up to gallons when get rootbound

### Timing of starting cuttings

Monardella cuttings should be rooted in spring

Some Manzanita do best started in Nov-Feb

# Starting Seeds

## Planting

If flats have big holes in bottom, line with screen

Winter is the best time to start seeds of shade plants because they will adapt to sun as the summer gets lighter

## Cleaning pulpy seeds

Pulp needs to be washed off or it will mold and prevent germination

Pulp prevents bird stomach from digesting seed

Rhamnus seeds should be soaked overnight to get pulp off, Ribes seeds can be put in blender

Best to remove chaff because chaff will rot and prevent germination

Plant seeds right away after washing off pulp, some seeds that dry out may take another year to sprout

## Seed treatments

Iris seeds should be soaked overnight

Hot-water soak for peas (Lupines and Cercis)

Stratification = in frig with damp vermiculite

Ceanothus needs hot water soak and then stratification in frig

Ash is useful to improve germination, Chamise ash works the best; burn dry branches

Put a few tablespoons in a gallon of water and water the flat

## Planting seeds

Use 1/3 peat, 1/3 perlite, 1/3 vermiculite

Don't cover fine seeds at all, just put on medium

Don't plant too thickly except for blue-eyed grass, grasses and yarrow

Plant seeds at 1 to 1-1/2 times their diameter

## Watering

Never saturate flats or drench because soil gets packed down

Do not overwater or underwater (1/4" a week)

Check middle and edge of flat/pot to see if more /less water needed

Use nozzles with gentle spray for seeds (eg Gardena)

## Caring for seedlings

Seedlings need to be off the ground and somewhat enclosed to protect from wind and rain (rain is hard on seedlings)

Air circulation is important so should not be completely enclosed, Place where get 5-6 hours of sun per day (even for shade plants)

## Pricking out after germination (2 true leaves)

Dudleya, Sedum etc are difficult to transplant

Plants that are easy from seed = Calycanthus, Iris, Monardella

Set pots in protected place until plants have started growing

## Seedlings need light

Fast growing plants may not grow well from seed if not enough sun

Start seeds in Jan or Feb when your growing area is in shade

If you have good sun area, you can start seeds earlier in fall

## Fertilizing newly potted seedlings

A bit of fertilizer is ok esp for larger plant or plant that will stay in pot

Use fertilizer low in nitrogen (N) and higher in phosphorus (P) and potassium (K)

Do not fertilize for a week after transplanting . Do not fertilize seed flats or seedlings will be too fragile

## **Pruning Techniques and Applicable California Native Plants -- 2013**

### **Shearing – very few natives (plants) like to be sheared, here are some that will tolerate it**

Arctostaphylos densiflora , Howard McMinn's Manzanita , Summer , Shearing is a bad idea for most other manzanitas

Prunus ilicifolia , Hollyleaf Cherry , Summer ,

Rhus ovata , Sugar Bush , Summer ,

Rhus integrifolia , Lemonade Berry , Summer ,

Myrica californica , Wax Myrtle , Summer ,

Salvia species , Sage , Summer , Do not cut into old wood/interior of plant!

### **Coppicing/Stooling**

Cutting trees/ shrubs to ground to encourage bushy new growth. Coppicing maintains trees at a juvenile stage, and a regularly coppiced tree will never die of old age—some coppice stools may therefore reach immense ages. The age of a stool may be estimated from its diameter, and some are so large—perhaps as much as 5.4 metres (18 ft) across—that they are thought to have been continuously coppiced for centuries. Yerba Buena Nursery, Wikipedia

Baccharis pilularis , Coyote Bush , Early Spring , Highly recommended! Necessary every 2-4 years

Carpenteria californica , Bush Anemone , Early Spring , May lose flowers for a year or two but shrub looks dramatically nicer

Cercis occidentalis , Redbud , Fall, Excellent for rejuvenating old thinning specimen

Cornus sericea , Red-twig Dogwood , Early Spring , Enhances shape and redness of stems - recommended!

Encelia californica , Brittlebush , Winter , Cut to 4" stub for bushy plant next year

Heteromeles arbutifolia , Toyon , Summer , Creates dense shrub from old, tree-like specimens

Philadelphus lewisii , Mock Orange , Summer , If specimen is sparse and woody this will create a dense shrub again

Rhamnus californica , Coffeeberry , Early Spring , Do only with old, open specimens

Sambucus mexicana , Blue Elderberry , Early Spring , Creates pleasing mounded shrub

Symphoricarpos albus , Snowberry , Winter , Rejuvenates old patches that have gotten woody

### **Plants that won't grow from bare wood, do NOT cut a branch unless there are at least two green shoots below**

Arctostaphylos spp, Manzanitas, won't regrow if branches are larger than your index finger

Salvia clevelandii and other woody sages, Cleveland's sage, cut back by 1/3 after blooming and maybe again in the fall to prevent shrub from splitting apart

Trichostema lanatum, Woolly blue curls

### **Pinching**

Mimulus aurantiacus, Sticky monkeyflower, pinch before buds appear in early spring and throughout the year  
Trichostema lanatum, Woolly blue curls, must deadhead or flowers will form past the dead blooms from the year before

### **Cane Growers**

Prune 1/3 of the oldest (largest) branches down to the ground throughout the shrubs, resort to coppicing only when necessary. See Fine Gardening article on the web

Carpenteria californica, Bush anemone, Early Spring  
Corylus californica var. cornuta, Western hazelnut, Late fall when dormant  
Galvezia speciosa, Island Bush Snapdragon, Summer and Fall, Deadhead flower stalks as they fade for denser plant and more flowers  
Mahonia aquifolium, Oregon Grape, Early spring after blooming  
Ribes aureum, R. sanguineum, Currants, After blooming  
Romneya coulteri, Matilija Poppy, Late fall/ Winter  
Physocarpus spp, Mock orange, Late fall/ Winter  
Spirea spp, Spirea, Late fall/ Winter

### **Bunch Grasses**

Cut back by one-half, or 'groom' to clean out (wear sturdy gloves)  
Deschampsia caespitosa, Tufted hair grass, Late fall when rains start  
Calamagrostis foliosus, Leafy reed grass, Late fall when rains start  
Festuca californica, F. idahoensis (cool season), Fescues, Late fall when rains start  
Muhlenbergia rigens (warm season), Deer grass, Early spring, cut to 3-4 inches above the ground, rake out the dead with a metal rake  
Needle grasses, Nassella cernua, N. lepida, N. pulchra, Late fall when rains start

### **My Favorite References for Pruning and Pruning California Natives**

"Guide to Pruning" by Cass Turnbull, good basic guide  
Yerba Buena Nursery Garden Guide "Basic Pruning and Deadheading Techniques...."  
"Care and Maintenance of Southern California Native Plant Gardens" by Bornstein, Fross and O'Brien

Much of this specific information comes from the Yerba Buena Nursery web site: [yerbabuenanursery.com](http://yerbabuenanursery.com) and my own personal experience.



*Blending artistry and ecology*

**Lawn Alternatives -- 2013**

Type	Botanical Name	Common Name	HxW	SCV WD	LBG
	<b>WALKABLE, MOWABLE</b>				
GC	<i>ACHILLEA MILLEFOLIUM</i>	COMMON YARROW	L NATIVE, 1' X 2'	Y	Y
GC	<i>DELTA BLUEGRASS 'NATIVE BENTGRASS™' SOD</i>	SEASHORE BENTGRASS (AGROSTIS PALLENS)	NATIVE	N	N
GC	<i>ARMERIA MARITIMA</i>	SEA THRIFT	NATIVE, 1'X1'	N	Y
GC	<i>CAREX PANSA</i>	CAL. MEADOW SEDGE	NATIVE, 1'X1	N	N
GC	<i>DELTA BLUEGRASS 'DELTA GRASSLAND MIX™'</i>	RED FESCUE, JUNE GRASS, SLENDER HAIR GRASS	NATIVE	MAY BE	N
GC	<i>FESTUCA RUBRA</i>	CREEPING RED FESCUE	NATIVE	Y	N
GC	<i>DYMONDIA MARGARETAE</i>	SILVER CARPET	S. AFRICA	Y	N
	<b>LOW AND BUNCHING PERENNIALS</b>				
GC	<i>ARMERIA MARITIMA</i>	SEATHRIFT	NATIVE	N	Y
GC	<i>DELTA BLUEGRASS 'NATIVE MOW FREE'</i>	FESCUES: MOLATE BLUE, IDAHO, AND WESTERN MOKELUMNE	NATIVE	MAY BE	N
GC	<i>FESTUCA CALIFORNICA</i>	CALIFORNIA FESCUE	NATIVE, 3' X 3'	Y	N
GC	<i>FESTUCA IDAHOENSIS</i>	IDAHO FESCUE	NATIVE, 1' X 1'	Y	N
GC	<i>FRAGARIA CHILOENSIS</i>	BEACH STRAWBERRY	NATIVE, 3' X 1'	N	Y
GC	<i>LEYMUS CONDESATUS 'CANYON PRINCE'</i>	WILD RYE	NATIVE, 6' X 4'	Y	N
GC	<i>MUHLENBERGIA RIGENS</i>	DEER GRASS	NATIVE, 4' X 4'	Y	Y
	<b>LOW SHRUBS</b>				
S	<i>ARCTOSTAPHYLOS UVA-URSI 'POINT REYES' or A.u. 'RADIANT' or A. 'EMERALD CARPET'</i>	BEARBERRY OR EMERALD CARPET MANZANITA	NATIVE, 1' X 6'	Y	Y
S	<i>ARTEMISIA PYCNOCEPHALA 'DAVID'S CHOICE'</i>	SAND HILL SAGE	NATIVE, 1' X 3'	Y	Y
S	<i>BACCHARIS PILULARIS 'TWIN PEAKS'</i>	DWARF COYOTE BRUSH	NATIVE, 3' X 8'	Y	Y
S	<i>CEANOTHUS GLORIOSUS VAR. GLORIOSUS 'ANCHOR BAY' or C. 'DIAMOND HEIGHTS' or C. GRISEUS HORIZONTALIS 'YANKEE POINT'</i>	PT. REYES CEANOTHUS or VARIEGATED CARMEL CREEPER or YANKEE POINT CEANOTHUS	NATIVE, 2' X 6' or 3' X 10'	Y	Y
S	<i>RHAMNUS CALIFORNICUS 'SEAVIEW IMPROVED'</i>	COFFEEBERRY	NATIVE, 1' X 6'	Y	Y
S	<i>RIBES VIBURNIFOLIUM</i>	CATALINA CURRANT	NATIVE, 4' X 4'	Y	Y
S	<i>SALVIA 'BEE'S BLISS' or 'DARA'S CHOICE' or SALVIA SONOMENSIS</i>	SAGE or CREEPING SAGE	NATIVE, 1' X 3'	Y	Y

**Abbreviations:** SCVWD = Santa Clara Valley Water District Rebate; LBG = Lawn Be Gone; **Lawn Be Gone rebates:** <http://bawasca.org/water-conservation/residential-water-conservation-programs/lawn-be-gone>, **Santa Clara Valley Water District rebates:** [www.valleywater.org/Programs/LandscapeRebateProgram.aspx](http://www.valleywater.org/Programs/LandscapeRebateProgram.aspx)

# Maintaining Your Native Garden

Mountain View

May 11, 2013

Sherri D. Osaka

Sustainable Landscape Designs

# Maintenance Topics

- Good Design
- Planting
- Propagating
- Weeding
- Pruning
- Irrigation and Watering

# Maintenance Budget

- How much time can you spend on the garden?
- How much time does your garden require?
- How to equate the two!



# Garden/ Garden Study City of Santa Monica



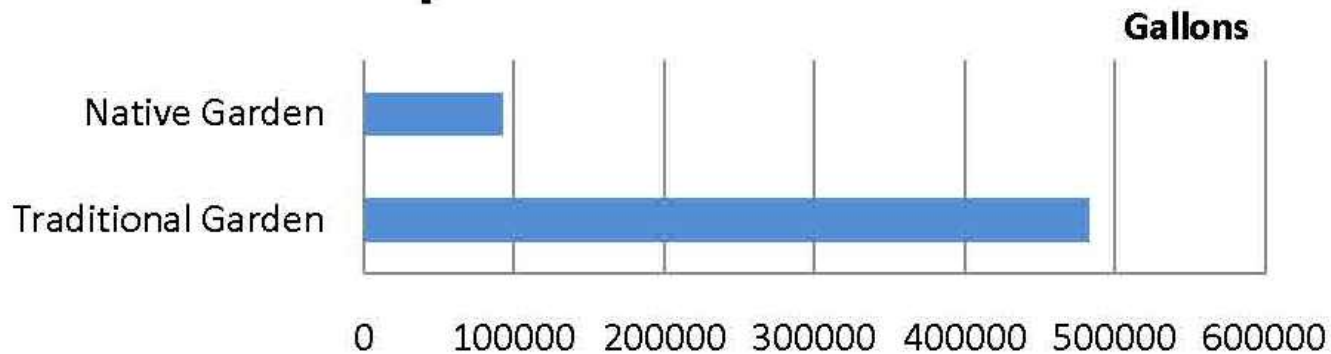
Traditional Garden



Native Garden

# Garden /Garden Study City of Santa Monica

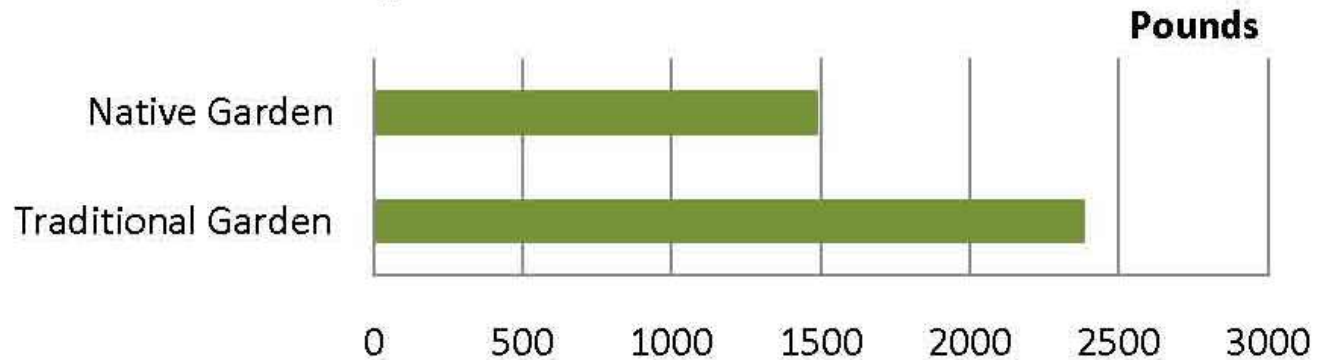
## garden \garden Water Use Comparison 2004-2010



	Traditional Garden	Native Garden
■ Water Use (in gallons)	482330	92673

# Garden /Garden Study City of Santa Monica

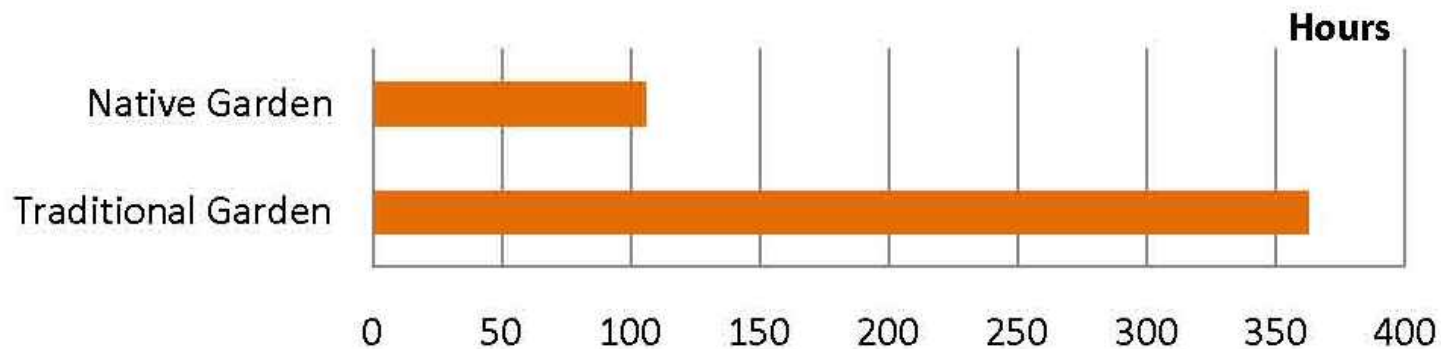
## garden \garden Green Waste Comparison 2004-2010



	Traditional Garden	Native Garden
Green Waste (in pounds)	2385	1491

# Garden /Garden Study City of Santa Monica

## garden\garden Labor Comparison 2004-2010



	Traditional Garden	Native Garden
Labor (in hours)	363	106

# Remove/ reduce your lawn



# Landscape Replacement Rebates – Santa Clara Valley Water District

- \$0.75/ square foot (\$1.50 in Palo Alto)
- Up to \$2000 (\$3000 max PA)
- 50% covered with plants
- Drip, microspray emitters or bubblers
- No pop-up sprays
- Mulch

# Walkable Lawn Alternatives



Red fescue: *Festuca rubra*

# Walkable Lawn Alternatives



Yarrow Lawn, *Achillea millefolium*, design by Stephanie Morris



# Walkable Lawn Alternatives



Photo from Greenlee Nursery, La Jolla, CA



Design/ Photo: Sherri Osaka

Meadow sedge, *Carex pansa*

# Lawn Alternatives - Perennials



Seathrift, *Armeria maritima* "lawn" by Agi Kehoe

# Lawn Alternatives - Shrubs



Ceanothus 'Yankee Point' by Stephanie Curtis, Curtis Horticulture

# Many Alternatives to a Lawn!



# Good Design

- Properly spaced plants
- Grouped by hydrozone
- Low – Medium – High heights
- Screening
- Creates/ takes advantage of views
- Proper irrigation

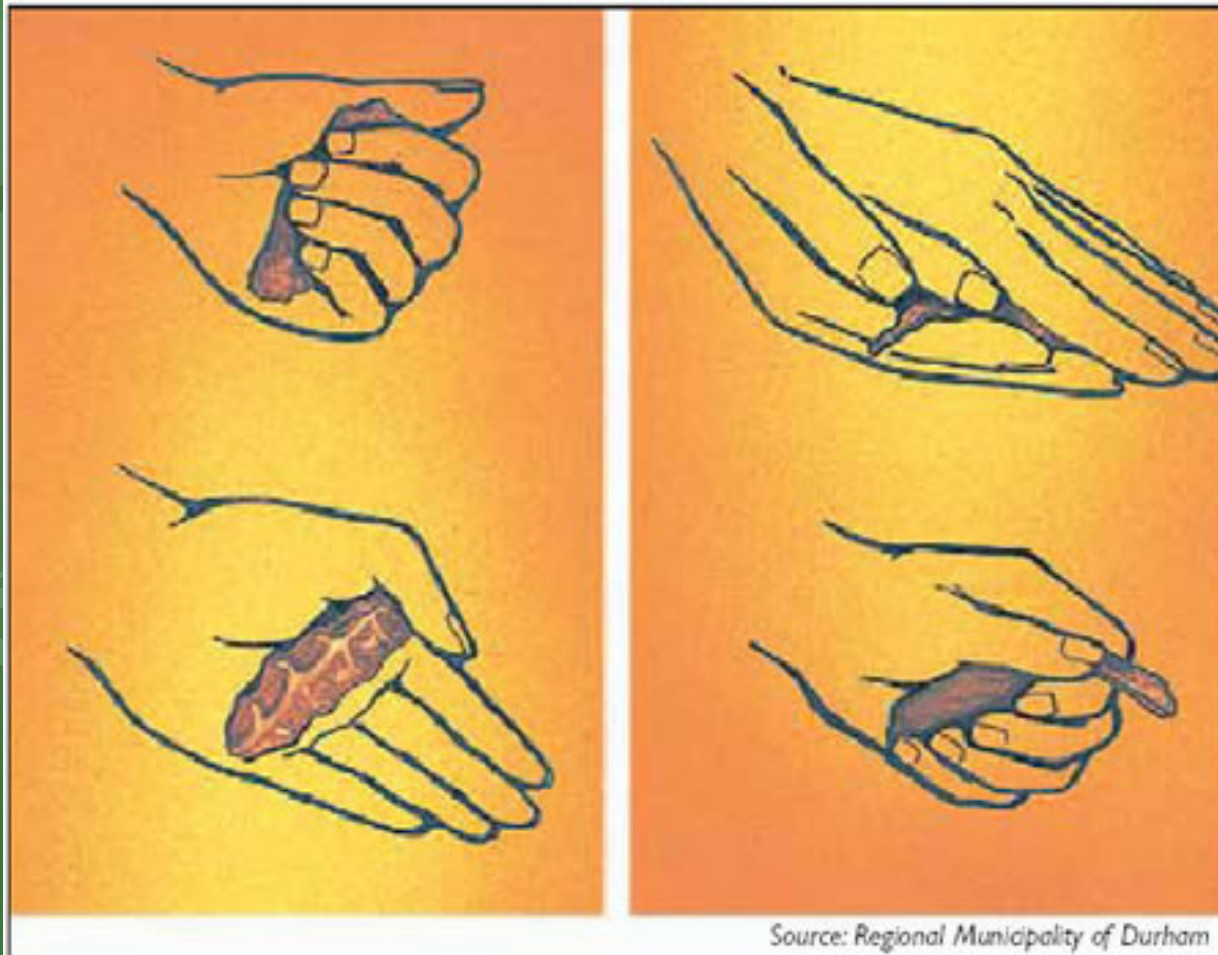
# Planting

The background is a solid green color with a subtle, repeating pattern of stylized leaves. The leaves are rendered in a slightly darker shade of green, creating a textured, organic feel. The word "Planting" is centered at the top in a white, serif font with a slight drop shadow.

# How to Plant Natives

- What type of soil do you have?
  - Ribbon test
  - Canning jar test
- How fast does it drain?
- Mediterranean climate

# Ribbon Test





# Jar Test

## JAR TESTING FOR SOIL TYPE

**SAND**



0 - 10% clay  
0 - 10% silt  
80 - 100% sand

**LOAM**

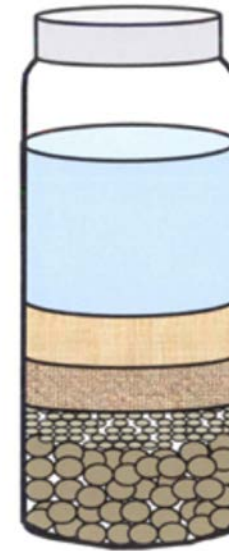


10 - 30% clay  
30 - 50% silt  
25 - 50% sand

**CLAY**



50 - 100% clay  
0 - 45% silt  
0 - 45% sand



Clay layer – water clears

Silt layer – 2 hours

Sand layers – 1 minute



Measure how fast it drains. This soil drained 2 1/2" per hour.

- Combination of clay soil, plus
- Watering when it's warm
- Can foster crown and root rots



<http://erec.ifas.ufl.edu/tomato-scouting-guide/diseases/fulsarium-crown-rot.shtml>



<http://www.forestryimages.org/browse/detail.cfm?imgnum=1371017>

## Potential Problems



- Woolly Blue Curls



Cleveland Sage

**Natives Susceptible to  
Rots**

# Berms



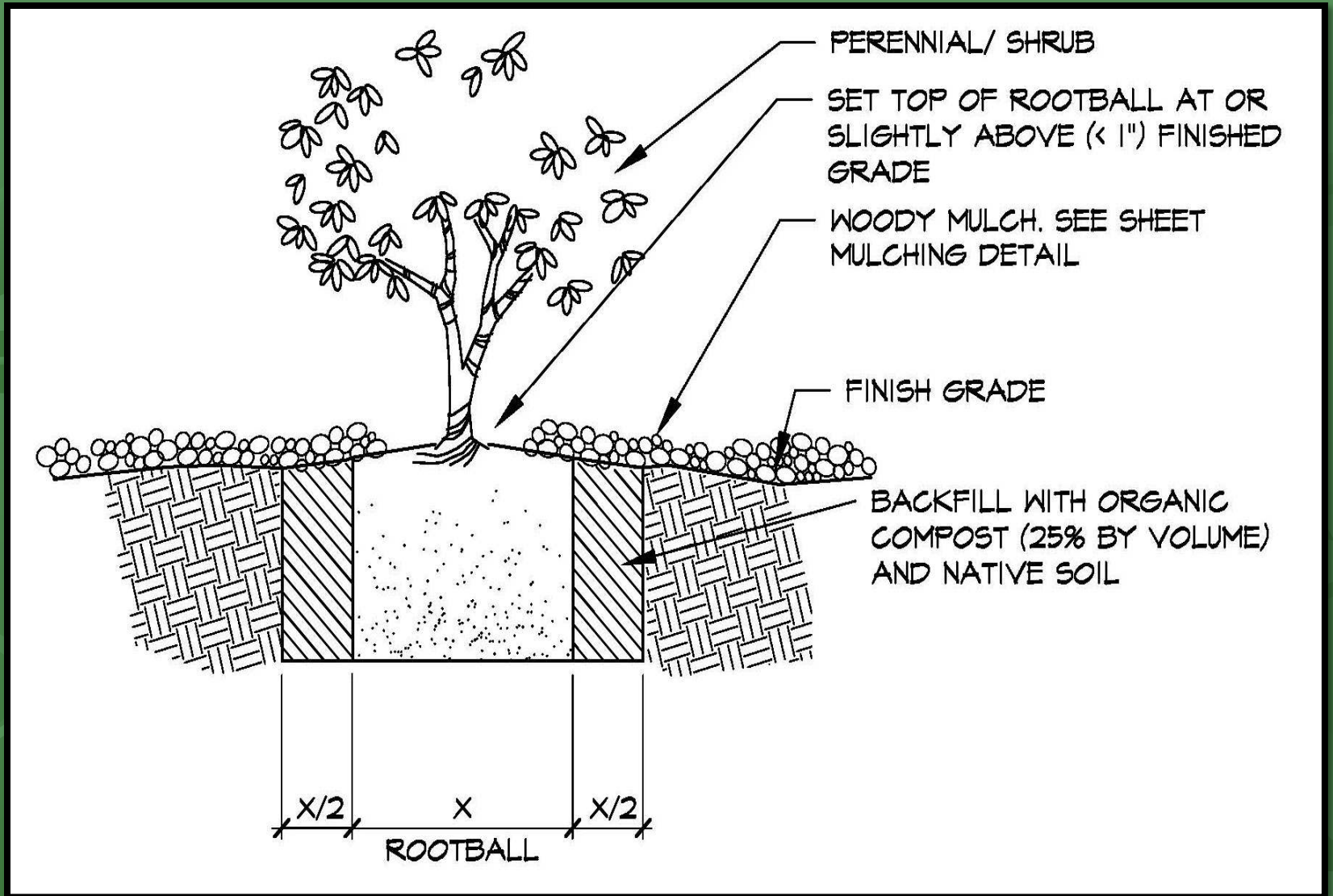




- Add Compost
  - Adds drainage
  - Aggregates the clay particles
  - Holds more water

## **Fine Gardening Article “Improving Clay Soils”**





# Planting technique

■ See Yerba Buena Nursery – “Garden Guides”

<a href="#"><u>Amelanchier alnifolia</u></a>	Serviceberry
<a href="#"><u>Aralia californica*</u></a>	Elk Clover
<a href="#"><u>Arctostaphylos bakeri 'Louis Edmunds'**</u></a>	Serpentine Manzanita
<a href="#"><u>Arctostaphylos 'Dr Hurd'**</u></a>	Dr. Hurd's Manzanita
<a href="#"><u>Arctostaphylos edmundsii 'Carmel Sur'**</u></a>	Carmel Sur Manzanita
<a href="#"><u>Arctostaphylos 'Green Supreme'**</u></a>	Green Supreme Manzanita
<a href="#"><u>Arctostaphylos densiflora 'Howard McMinn'**</u></a>	McMinn's Manzanita
<a href="#"><u>Arctostaphylos densiflora 'Sentinel'**</u></a>	Sentinel Manzanita
<a href="#"><u>Aristolochia californica</u></a>	Dutchman's Pipevine
<a href="#"><u>Artemisia douglasiana*</u></a>	Mugwort

# Clay-Tolerant Species

# Propagating

- Seeds
- Cuttings
- Dividing
- Air layering

# Seed Starting Materials

- Vermiculite
- Perlite
- Peat moss or coir
- Potting Soil
- 4" pots

# Seed Starting Set Up - Outdoor



# Seed Starting Set Up - Indoor



# Taking Cuttings

- Faster than seed
- Exact duplicate of the parent
- Bottom heat can help
- 1 part peat to 5 parts perlite

# Easy Natives to Propagate from Cuttings

- Willows (!!!), *Salix* spp
- Snowberries, *Symphoricarpus* spp
- Sticky monkeyflowers, *Mimulus* spp
- Beard tongue, *Penstemon* spp
- Mallows, *Lavatera* and *Malocothamnus* spp
- Red-twig dogwood, *Cornus sericea*

Matilija poppy instructions in “Fremontia” quarterly newsletter, Vol. 36, No. 4, page 18 (on the web)











# Cutting demonstration

The background of the slide features a pattern of stylized green leaves and stems, rendered in various shades of green, creating a textured, naturalistic backdrop.

# Dividing

- Iris
- Grasses
- Reeds, *Juncus* spp
- Sedges, *Carex* spp









# Air Layering

- Evergreen currant, *Ribes viburnifolium*
- Dutchman's pipe vine, *Aristolochia californica*







# Propagation Resources

- References: Seed Propagation of Native California Plants by Dara E. Emery, 1988
- Growing California Native Plants by Marjorie G. Schmidt, 1980
- YouTube Videos
- Gardeningwithnatives@yahoogroups.com listserv
- Thurs, Nov 14, 7:00 PM Seed and Cutting Exchange, Cupertino Community Center

# Weeds

The background of the slide features a pattern of green leaves, possibly from a maple tree, rendered in a low-poly, stylized manner. The leaves are scattered across the frame, with some showing prominent veins. A dark green gradient is applied over the entire image, creating a layered, semi-transparent effect that makes the leaves appear to be floating or layered on top of each other.



Flamer - use with caution on windy dry days!

Peaceful Valley Farm & Garden Supply



# Sheet Mulching

- Several methods
  - Plant first, then sheet mulch
  - Cut in
  - Plant after

# Sheet Mulching “Plant First” Method



Newspaper Sheet Mulch – 4- 6 layers

# Sheet Mulching “Cut In” Method



# Small Areas



# Weedy Areas





## Bermuda Grass Removal

- Two passes of sod cutter
- Rake out all roots
- Sheet mulch
- Plant on top of sheet mulch is best
- Hand weed any strays immediately

# Types of Paper

- Recycled newspaper
- Cardboard boxes
- Recycled content paper
- Cardboard rolls



# Mulch Types

- Arbor chips
- Grasses
- Palm Fronds
- Purchased bark mulch
- Purchased recycled mulch



Deer Grass  
trimmings



Stump  
grindings



# Other Mulch



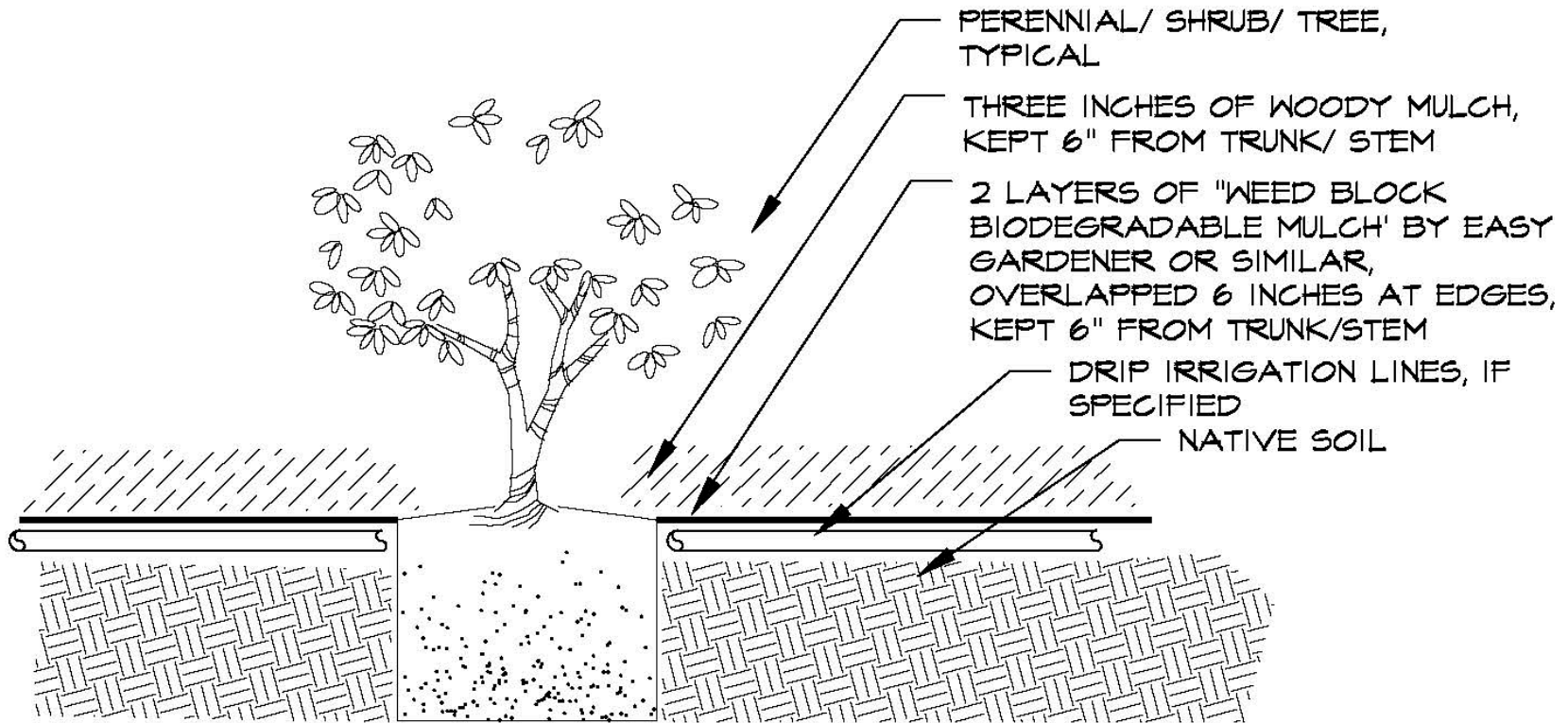
# Sheet Mulching “Plant In” Method

- Bay Friendly Video

# Mulch Amounts

- 3” deep = 0.25 feet or  $\frac{1}{4}$  of the square footage of the area
- 1000 square feet requires 250 cubic feet of mulch
- $250 \text{ cubic feet} / 27 = 9.25 \text{ cubic yards}$
- Or almost 10 cubic yards of material

# Detail of Sheet Mulching



## NOTES:

1. CONTRACTOR SHALL GRUB OUT WOODY WEEDS, SUCH AS IVY OR VINCA, PRIOR TO SHEET MULCHING
2. BERMUDA GRASS, OXALIS PES-CAPRAE, AND OTHER PERSISTENT, INVASIVE WEEDS MUST BE REMOVED/ ERADICATED PRIOR TO SHEET MULCHING.
3. 4-6 LAYERS OF NEWSPAPER OR 1-2 LAYERS OF CARDBOARD (DEPENDING ON THICKNESS) MAY BE USED INSTEAD OF WEED BLOCK PAPER.

# Pruning

- Shearing
- Coppicing/ stooling
- Cane growers
- Grasses and others
- Pinching

# Shearing – Don't do it!

- *Arctostaphylos densiflora* , Howard McMinn's Manzanita , Summer , Shearing is a bad idea for most other manzanitas
- *Prunus ilicifolia* , Hollyleaf Cherry, Summer,
- *Rhus ovata* , Sugar Bush, Summer,
- *Rhus integrifolia* , Lemonade Berry, Summer ,
- *Myrica californica*, Wax Myrtle, Summer ,
- *Salvia* species , Sage , Summer, Do not cut into old wood/interior of plant!

# Coppicing



# Natives to Coppice

- *Baccharis pilularis* , Coyote Bush , Early Spring , Highly recommended! Necessary every 2-4 years
- *Carpenteria californica*, Bush Anemone , Early Spring , May lose flowers for a year or two but shrub looks dramatically nicer
- *Cercis occidentalis* , Redbud , Fall, Excellent for rejuvenating old thinning specimen
- *Cornus sericea* , Red-twig Dogwood , Early Spring , Enhances shape and redness of stems - recommended!
- *Encelia californica* , Brittlebush , Winter , Cut to 4" stub for bushy plant next year
- *Heteromeles arbutifolia* , Toyon , Summer , Creates dense shrub from old, tree-like specimens
- *Philadelphus lewisii*, Mock Orange, Summer , If specimen is sparse and woody this will create a dense shrub again
- *Rhamnus californica* , Coffeeberry , Early Spring , Do only with old, open specimens
- *Sambucus mexicana* , Blue Elderberry , Early Spring , Creates pleasing mounded shrub
- *Symphoricarpos albus* , Snowberry , Winter , Rejuvenates old patches that have gotten woody



# Cane Growers

The background of the slide features a pattern of stylized green leaves and stems, rendered in various shades of green, creating a textured, organic feel.









# Grasses

The background of the slide is a solid green color with a faint, stylized pattern of overlapping leaves and stems in a slightly darker shade of green. The leaves are elongated and pointed, with visible veins. The stems are thin and branch out from the base of the leaves.



Y  
e  
r  
b  
a  
B  
u  
e  
n  
a  
N  
ursery©



*Muhlenbergia rigens* – Deer grass



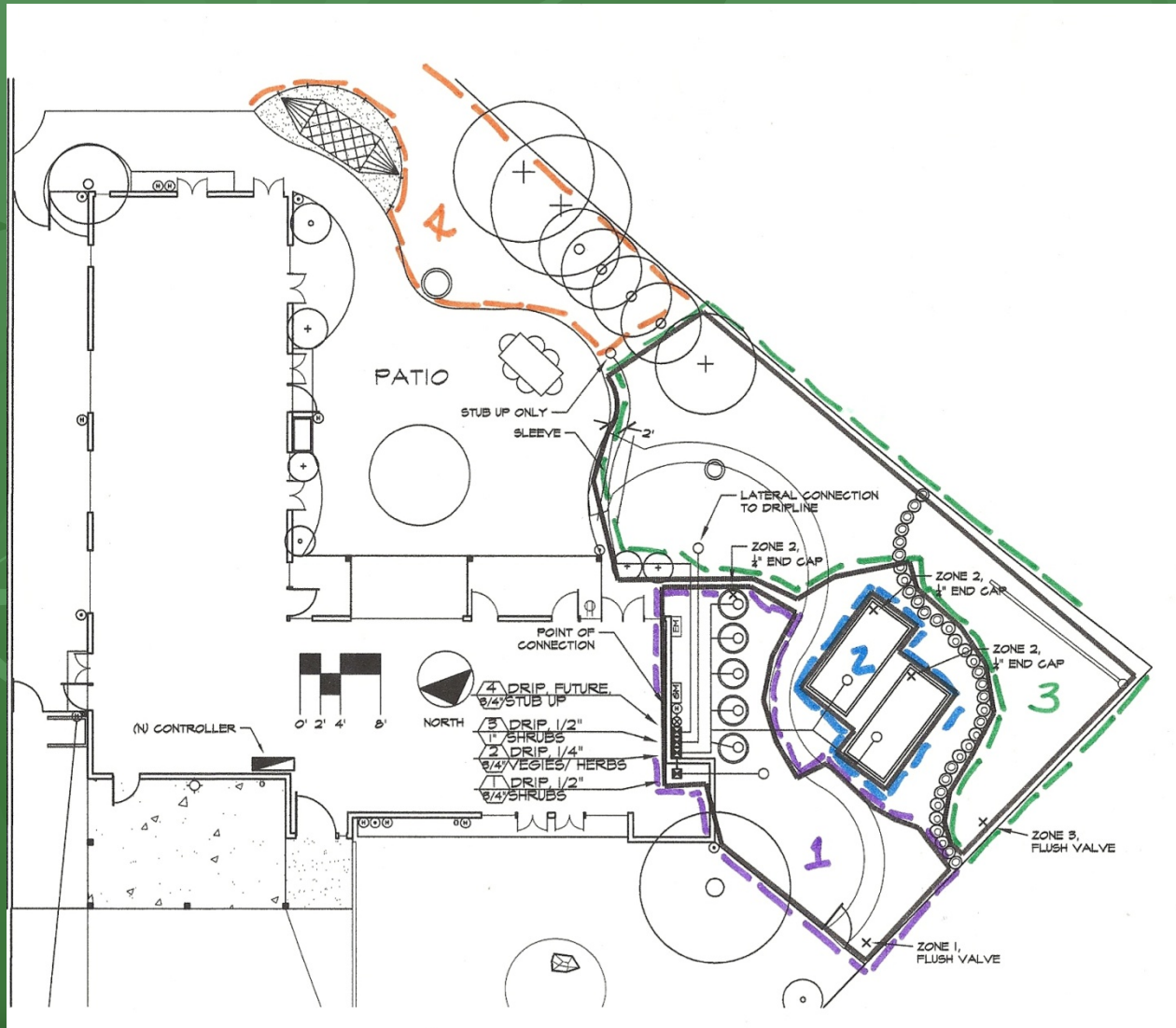
# Pinching



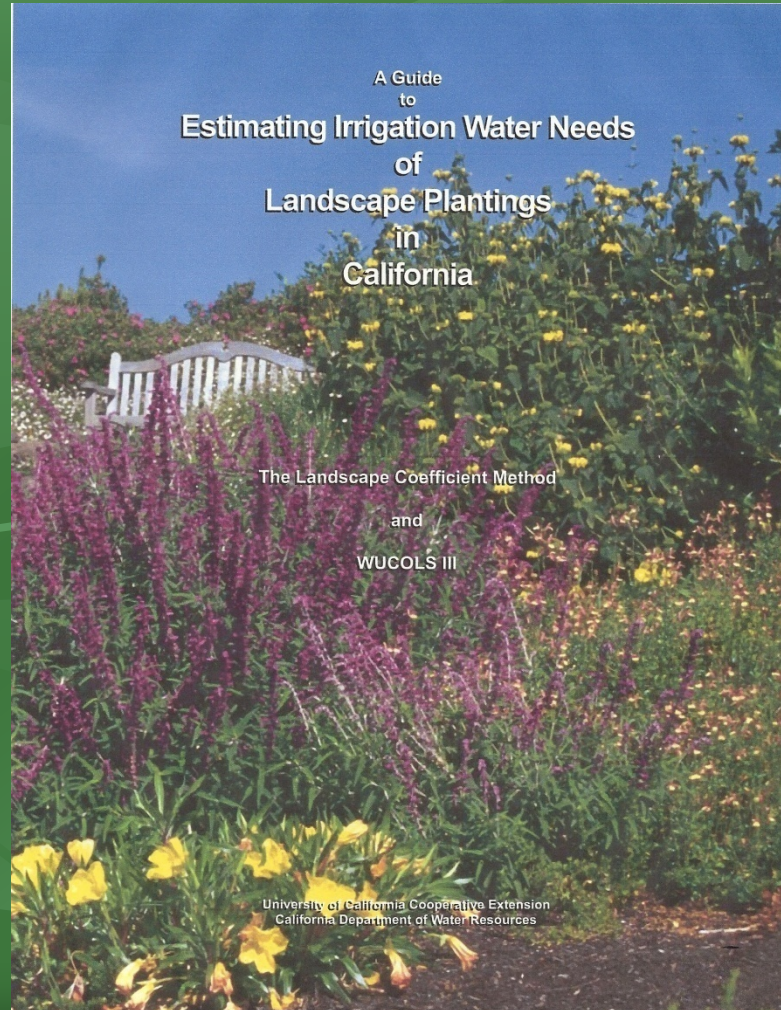


# Watering

# Hydrozoning



# Water Use Classifications of Landscape Species (WUCOLS)



# No Water Landscape

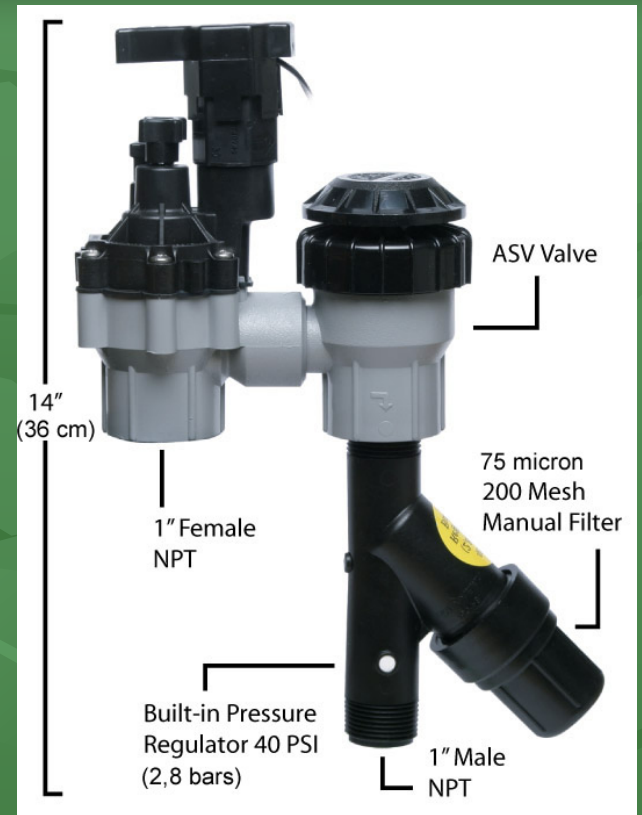


# No Water Landscape



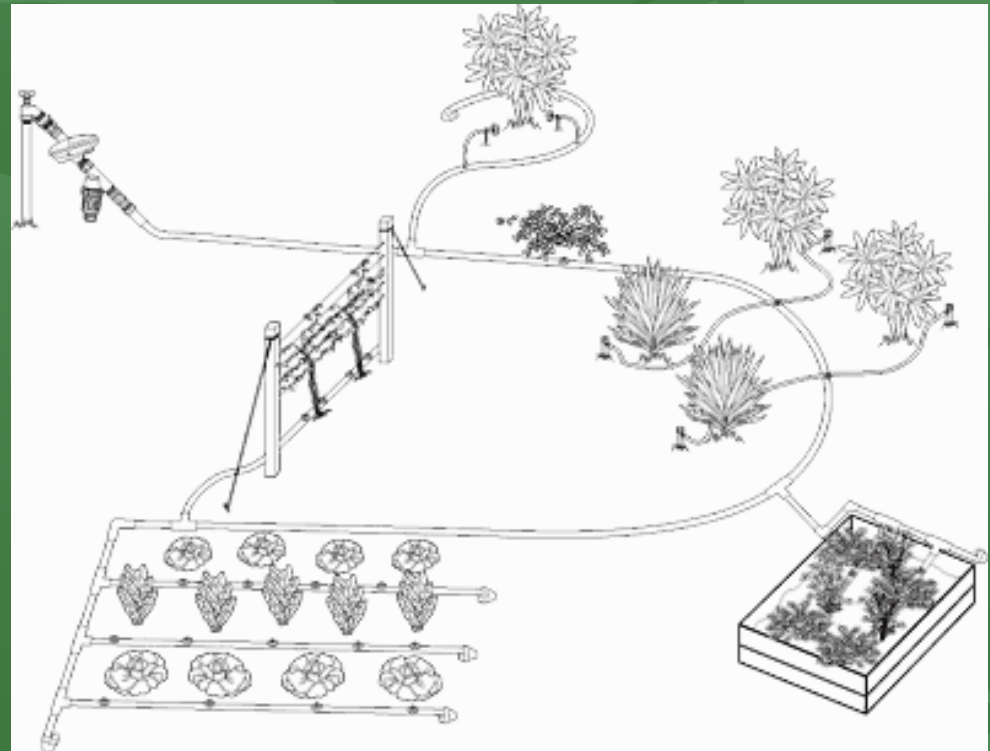
# Components of Drip Irrigation

- Valves with filters
- Drip emitters
- Inline emitters
- End caps



# Two Drip Irrigation Methods

- Per Plant Method
  - Add emitters per each plant
  - More efficient when plants are small
  - Less expensive to install
  - Limits root and plant growth
  - Requires more maintenance
  - Some adjustments for differing water requirements





# Two Drip Irrigation Methods

- Grid Method
  - Waters all the soil, mimics rainfall
  - Inefficient when plants are small
  - Better long term for growth
  - More expensive to install
  - Must hydrozone!



# Subsurface Drip Irrigation for Lawns



Lawn uses subsurface  
drip irrigation—  
Recommend Netafim  
Techline CV products

How to determine how long you need to water with Drip irrigation?

Key conversion = 1 cubic foot = 7.48 gallons

Lawn needs about 1" of water/week

$$\frac{1'' \text{ of water} \cdot \text{sf}}{\text{sf}} \times \frac{\text{ft}}{12''} = \frac{.0833 \text{ cu ft of water}}{\text{sf}}$$

$$\frac{.0833 \text{ cu ft}}{\text{sf}} \times \frac{7.48 \text{ gallons}}{\text{cu ft}} = \frac{0.62 \text{ gal}}{\text{sq ft}} \text{ per week}$$

Delivery = 0.6 gal/hr emitters spaced at 18" apart (1.5' apart)

$$\frac{0.62 \text{ gal}}{\text{sq ft}} \times \frac{\text{hr}}{0.6 \text{ gal}} \times \frac{60 \text{ min}}{\text{hr}} \times 1.5' \times 1.5' =$$

$$\boxed{139.5 \text{ min/week}}$$

Delivery = 1.83 in/hr spray heads

$$\frac{1'' \text{ of water}}{\text{sf}} \times \frac{\text{hr}}{1.83 \text{ in}} \times \frac{60 \text{ min}}{1 \text{ hr}} = \boxed{33 \text{ min/week}}$$

# ET 'Smart' Controller

- Use weather information to determine precise water needs, adjusted daily
- Some charge monthly fee for connection to weather station
- Many manufacturers



# Watering – Newly Planted

- Every day or every other day, right after planting
- Once per week 1<sup>st</sup> summer water
- Once every 2 weeks for 2<sup>nd</sup> summer
- Once per month, 3<sup>rd</sup> summer if very low or low water shrubs
- Use moisture probe to ensure soil is moist after watering but dries out in between.
- Make sure the root ball gets wet!!!



# Watering Frequency

- Established plants
  - Very low – once per month or not at all
  - Low – once per month or every other week
  - Medium – once per week or every other week
  - High water – several times per week (European lawn grasses)

# Irrigation Maintenance

The background of the slide features a pattern of stylized green leaves. The leaves are rendered in various shades of green, from a light, almost white-green to a deep forest green. They are arranged in a way that suggests a dense, healthy plant. The overall aesthetic is clean and natural, fitting for a presentation about irrigation and agriculture.

# Irrigation Maintenance

- Spring tasks
  - Check/ clean the filter
  - Open the flush valve and turn on the station, flush for 5 minutes
  - Close the flush valve and walk the system, listen and look for leaks
- Monthly summer tasks
  - Read your water bill
  - Turn on and walk each zone listening and looking for leaks





# Case Study – East San Jose



Before

After



# Drought tolerant landscapes – Case study bird sanctuary



Before



Pondless waterfall on timer for birds



After



Before

# Drought-tolerant landscape

## Case study lawn replacement



Before



After: 18 species of native plants

# Case Study -- Craftsman Remodel



# Pervious Concrete with Brick Bands



Design by Sherri Osaka, Installation by Earthcare Landscaping



# Drought-tolerant landscapes

## Case study front yard





# Native Plant Maintenance References

- California Native Gardening: A Month-by-Month Guide by Helen Popper
- “Care and Maintenance of Southern California Native Plant Gardens” by O’Brien, Landis, and Mackey
- CNPS-SCV.org web site, look under education tab for videos
- Gardeningwithnatives@yahoogroups.com listserv