

# Module #5

## Selecting Locally-Adapted Plants for Municipal Landscapes

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UCCE Orange

March 23<sup>rd</sup>, 2016

# Session Topics

- What are locally adapted plants?
- Water Efficient Plant Terminology
- Plant Selection Resources



# Native and Mediterranean Plants



# Locally-Adapted Plant Selection

- Mediterranean climate-adapted plants
  - Adapted to dry summers
  - Other plants in landscapes use more water in the summer
  - Doesn't only include California natives



# Water Efficient Plant Terminology

- Drought tolerant
  - A plant with the ability to survive in a dry environment
- Xerophyte
  - Plants that exist in dry environments



# Drought Mechanisms

- Avoidance
  - Drought escape
  - Water conserving
  - Effective water uptake
- Tolerance
  - Turgor maintenance
  - Antioxidants- protective tissues
- Efficiency
  - Maintain growth under dry conditions



# Characteristics of Water Efficient Plants



## Structural

- Deep root system
- Internal water storage
- Strong internal support

# Characteristics of Water Efficient Plants



## Leaf Adaptations

- Smaller
- Gray, light-green, or blue-green in color
- Uneven surfaces
- Orientation
- Hairy
- Thick - often waxy

# Plant selection & design

- Hydrozones
  - Plants with similar water use within an irrigation zone
  - Obtain information on predicted plant water use
    - WUCOLS- Water Use Classification of Landscape Species

[www.ucanr.sites/WUCOLS](http://www.ucanr.sites/WUCOLS)

- Home Page
- User Manual
- Plant Search Instructions
- Plant Search Database
- Download WUCOLS IV Plant List
- Download WUCOLS IV User Manual
- Water Requirements for Turfgrasses
- Partners
- Acknowledgements

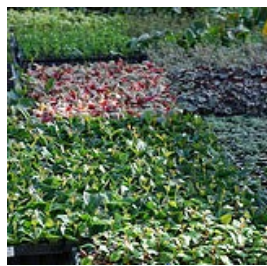
### Home Page

**GETTING STARTED**

If you are using the WUCOLS list for the first time, it is essential that you read the User Manual. The manual contains very important information regarding the evaluation process, including water needs, plant types, and climatic regions. It is necessary to know this information to use WUCOLS evaluations and the plant search tool appropriately. To access the User Manual, click on the *User Manual* tab (on left) and view specific topics.

Water conservation is an essential consideration in the design and management of California landscapes. Effective strategies that increase water use efficiency must be identified and implemented. One key strategy to increase efficiency is matching water supply to plant needs. By supplying only the amount of water needed to maintain landscape health and





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<http://arboretum.ucdavis.edu/>*

# All-Stars Simple Search

UC Davis Arboretum All-Stars Simple Search

http://arboretum.ucdavis.edu/searchSimple.aspx

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ARBORETUM All Stars

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Collections and Gardens  
Education  
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**Arboretum All-Stars**  
All-Star Plant Search

**Plan Your Visit**  
Directions  
Arboretum Map  
Tours

**School Programs**  
Planning & Organizing Your Visit  
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UC Davis Arboretum  
University of California  
1 Shields Avenue  
Davis, CA 95616  
phone: (530) 752-4880  
fax: (530) 752-5300

Please search our Arboretum All-Stars plant database to find the UC Davis Arboretum's top recommended plants for Central Valley gardens. To begin, fill in any search criteria and click Submit Search.

### Simple Search

Common Name:

Latin Name:

Plant Type:

Flower Color:  
 Blue  Gold  Green  Lavender  Orange  Pink  Purple  
 Red  Yellow  Violet  White  Multi  Tan

Wildlife Value:

Water Use:

Exposure:  
 Full Sun  Full Sun or Part Shade  Afternoon Shade  Shade

California Native:  Yes  No  Both

**5 plants have met your search criteria, scroll down to view results.**

**Wayne Roderick seaside daisy**

**Description:** The native perennial sports cheerful lavender flowers over a long bloom season, providing food for butterflies and beneficial insects in spring, summer, and into the fall.




Photo: Clyde Elmore




Photo: Clyde Elmore

[Click here for details on Erigeron 'Wayne Roderick'](#)

‘Valley Violet’ California Lilac  
*Ceanothus maritimus*





# Field Testing

High, medium, and low water use

S.K. Reid and L.R. Oki. 2008. Field trials identify more native plants for urban landscaping. *California Agriculture*. 62(3): 97-104).



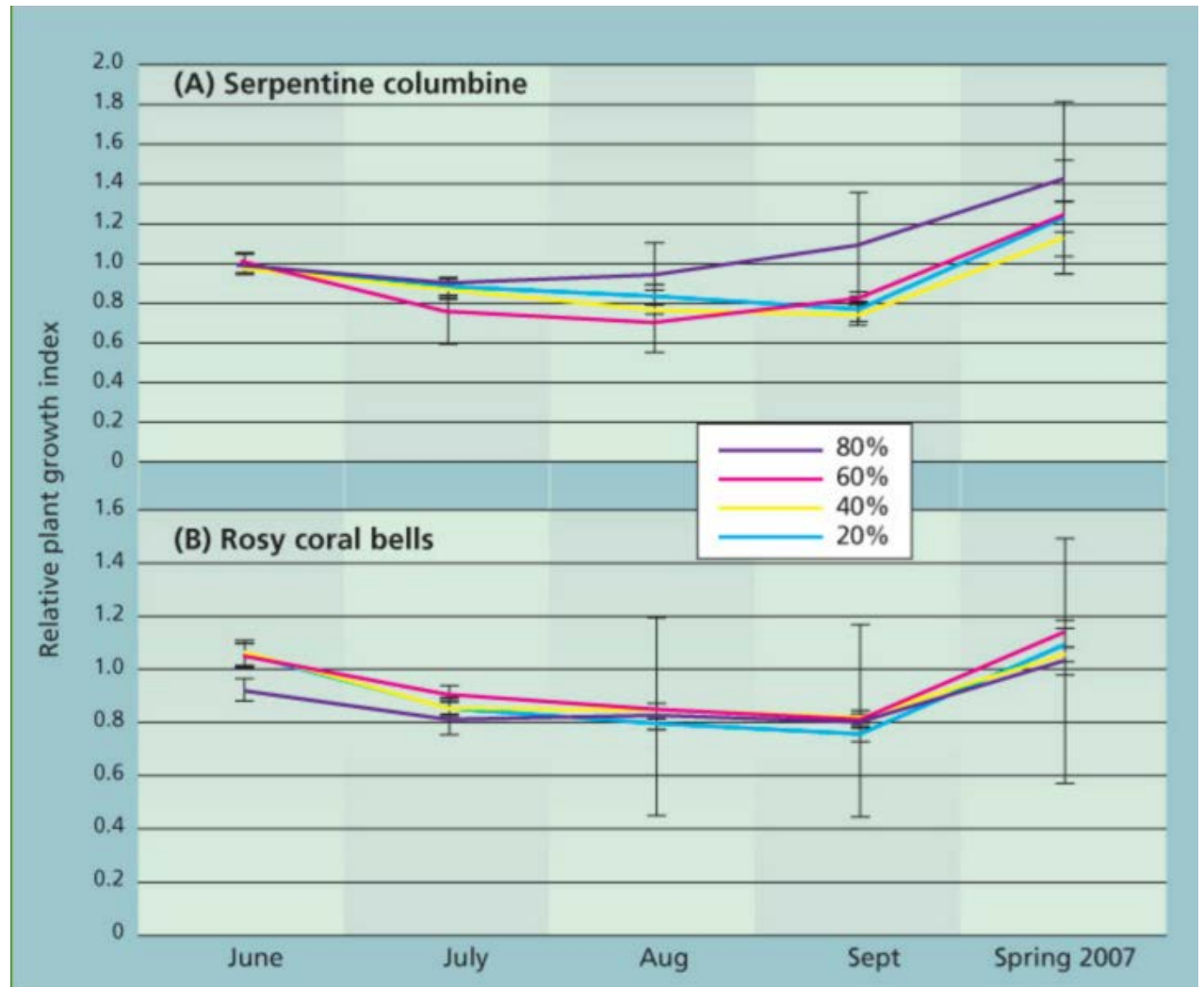
**TABLE 1. Species in plant trial, from UC Davis Arboretum All-Stars and potential All-Stars**

<b>Common name (species)</b>	<b>Plant type</b>	<b>Result</b>
Apache plume ( <i>Fallugia paradoxa</i> )	Evergreen woody perennial	Eliminated: untidy appearance and free-seeding
California beach aster ( <i>Lessingia filaginifolia</i> )	Herbaceous evergreen groundcover	Eliminated: froze in winter 2005
California lilac 'Valley Violet' ( <i>Ceanothus maritimus</i> )	Evergreen woody perennial	Advanced
Coast gum plant ( <i>Grindelia stricta</i> )	Low-growing herbaceous perennial	Eliminated: died in heat or froze in winter 2005
Creeping sage ( <i>Salvia sonomensis</i> )	Herbaceous ground cover	Eliminated: rotted in spring transplant 2005 or froze in winter 2005
Eyelash grass or blue grama grass ( <i>Bouteloua gracilis</i> )	Warm-season bunch grass	Advanced
Serpentine columbine ( <i>Aquilegia eximia</i> )	Evergreen herbaceous perennial	Advanced
Rosy coral bells ( <i>Heuchera rosada</i> )	Evergreen herbaceous perennial	Advanced
San Diego sedge ( <i>Carex spissa</i> )	Sedge	Advanced
Seaside daisy ( <i>Erigeron</i> 'Wayne Roderick')	Low-growing herbaceous perennial	Eliminated: froze in winter 2005



**TABLE 2. Irrigation frequencies for native plant trial, based on reference evapotranspiration (ET<sub>o</sub>) water-use percentages**

% ET <sub>o</sub> of treatment	Irrigation frequency during 2006 growing season
	..... days .....
80	13–18
60	16–23
40	26–34
20	58 (twice during the season)





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## Enhancing urban living through horticulture

Located at the University of California, Davis, the **California Center for Urban Horticulture (CCUH)** draws upon the knowledge and expertise of our partners in academia, industry, and the public with a mission to help Californians

- develop more water-conserving, pest-resistant and disease-resistant home gardens
- create environmentally sound public landscapes and parks
- produce better plant materials for sustainable urban landscapes

We seek to address the state's growing water demands, increasing chemical inputs into the environment, and loss of wild lands in order to improve the quality of urban life.



### News

Save the Date! YSB: Creating a Living Landscape March 28th, 2015

Jan 14, 2015

Rose Weekend 2015-HOLD THE DATES! May 2nd & 3rd

Dec 01, 2014

[More news...](#)

### Featured

New article about the TRIC on the UCANR Master Gardener Website!

Low Water Use Landscaping Presentations from Nov 8th Available Here

Tree Ring Irrigation Contraption (TRIC): A New Way to Water Trees with Confidence

New Presentations Available about the PRE (Plant Risk Evaluation) Tool

Academic Plant Trials-UCD & UCANR researchers discover how plants can use less water and still look good in the garden



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## UC Davis Irrigation Field Trials for Landscape Plants

UC Davis horticulturists are evaluating landscape plants with the potential to be good performers in low-water use gardens. Some of these plants have been from the [UC Davis Arboretum All-Stars lists](#), and others are provided by growers and breeders who want to evaluate their new plant varieties for low-water use in hot California gardens. These plants are being tested under four different irrigation frequencies for growth, heat tolerance, pest and disease resistance and attractive appearance. Additionally, Master Gardener volunteers are growing these plants in demonstration gardens throughout the state, documenting their appearance and performance in their varied climate zones. The results of these trials are providing growers and retailers the information they need to successfully distribute and market these plants to the public.

### Irrigation Trials

After being grown for a full year on a regular watering regime to establish deep, healthy roots, plants are irrigated through the second year at four levels, ranging from 20-80% percent of normal evapotranspiration (total water lost through evaporation from plants and surrounding soil). A weather station collects data to calculate these percentages, while height and width are measured to calculate a growth index for each species at each water level. Overall appearance, flowering time and duration, and pest or disease problems are noted to provide a comprehensive assessment of performance.



### Upcoming Events

#### Get Ahead or Get Parched: Six Ways to Survive the Drought

A workshop on landscape management during drought, designed for landscape irrigation managers.

Apr 09, 2014

#### Rose Weekend-Saturday May 3rd & Sunday May 4th, 2014

Final agenda and Rose Catalog coming soon!

May 03, 2014

[See more events](#)

### News

Pollinator Gardening Workshop Presentations

Mar 26, 2014

Current Issues in Invasive/Emerging Pests & Diseases Workshop Available for Download

Feb 11, 2014

[More news...](#)

### Featured

Landscaping Resources During Drought  
(**NEW 3/3/14**: Drought Messages for Landscape Managers)

WUCOLS IV Website

Kurapia: Low Water Groundcover

Landscape Water Conservation Resources Map

**Table 4. Average annual overall quality ratings on 4 ET<sub>0</sub>-based irrigation treatments for 14 perennial landscape species in 2014.**

PLANT NAME	Overall Rating on each ET <sub>0</sub> % (1-5)				Recommended rate
	80	60	40	20	
<i>Buddleia</i> 'Purple Splendor'	4.0	4.1	4.1*	4.3	20-40%
<i>Buddleia</i> Flutterby Petite™ 'Tutti Fruitti'	3.9*	3.4	3.7	3.8	80%
<i>Ceanothus</i> 'Concha'* <sup>1</sup>	4.3 <sup>n=1</sup>	3.1 <sup>n=2</sup>	∅	3.9 <sup>n=3</sup>	20% <sup>2</sup>
<i>Dianthus</i> Everlast 'Orchid'	3.4	3.8*	3.6*	3.7	40-60%
<i>Epilobium</i> 'Sidewinder'*	4.3*	4.4	4.4	4.2	20-80%
<i>Epilobium</i> 'Sierra Salmon'*	3.7*	3.7	3.5	3.7	20-80%
<i>Geranium</i> 'Rozanne'	3.6*	3.7	3.5	3.4	60-80%
<i>Helichrysum amorginum</i> 'Ruby Clusters'	3.9*	3.5	3.6*	3.6	40- 80%
<i>Kniphofia</i> 'Elvira'	3.3*	3.3	2.9	2.9	60-80%
Kurapia ®	4.2	4.1	4.1*	4.2*	20-40%
<i>Lomandra longifolia</i> 'Bushland Green'	4.1	3.7	4.3*	4.2	20-40%
<i>Lonicera periclymenum</i> 'Peaches and Cream'	3.5	3.4*	3.5	3.4	60%
<i>Miscanthus sinensis</i> 'Little Zebra'	3.8	4.2*	4.0	3.5	40-60%
<i>Trachelospermum</i> 'Sassy' <sup>1</sup>	3.1 <sup>n=2</sup>	3.1 <sup>n=1</sup>		3.1 <sup>n=1</sup>	Not recommended in full sun in this zone

**Table 4. Summary of average overall quality ratings on 4 irrigation treatments for 2013; significantly highest ratings are in bold print. \*Denotes a California native species or cultivar.**

PLANT NAME	Overall Rating on each ET <sub>0</sub> % (1-5)				Recommended rate
	80	60	40	20	
<b>SUN</b>	<b>80</b>	<b>60</b>	<b>40</b>	<b>20</b>	
<i>Arctostaphylos densiflora</i> 'Howard McMinn'*	3.6	3.5	<b>3.8</b>	3.5	40%
<i>Calamagrostis</i> × <i>acutiflora</i> 'Karl Foerster'	<b>4.7</b>	4.4	4.3	4.2	20-80%
<i>Cerastium tomentosum</i>	3.1	3.0	2.8	3.1	20-80%
<i>Ceratostigma plumbaginoides</i>	<b>3.9</b>	3.3	3.4	3.5	80%
<i>Delosperma cooperi</i>	3.8	3.6	3.8	<b>4.0</b>	20%
<i>Isomeris arborea</i> *	3.4	2.6	3.4	<b>3.6</b>	20%
<i>Kniphofia</i> 'Christmas Cheer'	3.3	3.0	3.3	3.3	40-80%
<i>Phlomis purpurea</i>	3.3	3.7	3.8	3.7	20-60%
<i>Rosa</i> 'Pink Grüss an Aachen'	3.6	3.2	3.6	3.4	40-80%
<i>Salvia microphylla</i> 'Hot Lips'	3.7	4.0	4.0	3.6	40-60%
<i>Teucrium chamaedrys</i> 'Prostrata'	3.9	<b>4.2</b>	4.0	3.7	60%
<i>Teucrium fruticans</i> 'Azureum'	3.5	3.7	3.8	3.9	20-40%
<b>SHADE</b>					
<i>Berberis aquifolium</i> 'Compacta'*	3.6	3.8	<b>4.0</b>	3.8	40%
<i>Ceratostigma plumbaginoides</i>	3.4	3.3	3.4	3.3	20-80%
<i>Cyrtomium falcatum</i>	2.9	3.5	3.3	<b>3.7</b>	20%
<i>Daphne odora</i> 'Aureomarginata'	3.2	<b>3.5</b>	3.2	3.3	20-60%
<i>Festuca californica</i> *	3.5	3.2	3.8	3.7	20-40%
<i>Neomarica caerulea</i>	3.3	3.6	3.6	<b>3.8</b>	20%
<i>Sollya heterophylla</i>	3.9	4.0	4.1	3.9	20-80%

Table 5. Summary of average overall quality ratings in 10 MG demonstration gardens; AR = already growing – recommended; x means it did not survive to the end of the trial period.

COUNTY	Alameda	Los Angeles	Mariposa	Nevada/Placer	Orange	SD- inland	SD- coastal	San Joaquin	Shasta	Ventura
Sunset Climate Zone	14	21	7	7	23	21/23	24	14	9	21
<b>SUN</b>										
<i>Arctostaphylos densiflora</i> 'Howard McMinn'	4.4	AR	4.6	AR	4.0	4.3	3.4	AR	3.0	4.1
<i>Calamagrostis acutiflora</i> 'Karl Foerster'	3.5			3.7	2.2*		3.7	4.0	3.4	x*
<i>Cerastium tomentosum</i>	3.1			AR	2.2		3.2	3.4	3.4	1.0
<i>Ceratostigma plumbaginoides</i>	3.6			3.1	2.4	3.3	2.9	3.8	2.0	3.5
<i>Delosperma cooperi</i>	3.7			3.5		4.1		2.3	2.8	2.9
<i>Kniphofia</i> 'Christmas Cheer'	3.9			3.4	3.1	3.2	3.1	4.1	2.7	3.1
<i>Teucrium chamaedrys</i> 'Nanum'	4.2			4.0	3.7	3.1	3.7	4.8	2.8	2.7
<i>Teucrium fruticans</i>	3.4			AR		3.9	4.0	4.2		3.8
<b>SHADE</b>										
<i>Berberis aquifolium</i> 'Compacta'		4.0	4.1		3.6	3.0	2.8		2.7	3.6
<i>Neomarica caerulea</i>					4.0				2.2	3.0
<i>Cyrtomium falcatum</i>	x							3.9	2.4	x
<i>Daphne odora</i> 'Aureomarginata'					4.3	4.2	2.8 <sup>#</sup>	5.0	3.9	2.8 <sup>#</sup>
<i>Ribes malvaceum</i>	x	x	3.4			x	x	x	x	x

\*Ratings adversely affected by repeated rabbit damage

<sup>#</sup> Ratings adversely affected by failure to adequately irrigate during establishment





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<http://ccuh.ucdavis.edu/Resources/plant-trials>

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PHOTOS



VISITOR POSTS



**UC Landscape Plant Irrigation Trials**

March 8 at 4:29pm · 🌐

It's almost time again for our Open House Ratings Days! If you are interested in joining us in the field for our Spring ratings event on either Tuesday April 26 or Wednesday April 27, email us for directions and more information. Jared Sisneroz: [jasisneroz@ucdavis.edu](mailto:jasisneroz@ucdavis.edu), with a copy to Karrie Reid: [skreid@ucanr.edu](mailto:skreid@ucanr.edu).

UCCE Master Gardeners of Alameda County and Kate Lincoln like this.

1 share



**UC Landscape Plant Irrigation Trials**

February 23 at 4:02pm · 🌐

Teucrium fruticans 'Azureum'. A wonderful winter bloomer that performed best on our two lowest irrigation treatments- a deep soaking every 4-8 weeks. This photo is from my Demo Garden in Stockton where the soil is fairly heavy clay. It takes to shearing quite nicely, but be careful not to do it too late in summer/fall or you may compromise the fantastic vivid blue winter blooms. They look a bit violet here, but it is just an effect of the afternoon light. Behind it is Kniphofia 'Christmas Cheer' which appears in previous photos.



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Recent

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Home

## New Resources

We've created a new map, you'll find information on plants, rebates...

**NEW:** As of 1/1/15, this map will include updates...

Select the appropriate county...



Please email us at [jjtso@ucdavis.edu](mailto:jjtso@ucdavis.edu)

Compiled by Jennifer T...

Get directions

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### Landscape Water Conservation Resources

In this map, you'll find information published by your local municipalities, including conservation practices, low-water plants, rebate programs, and more.

Please email us at [jjtso@ucdavis.edu](mailto:jjtso@ucdavis.edu) with feedback or to add resources to the map. To add your site, include the name, water conservation webpage URL, and the jurisdiction of the entity (counties covered).

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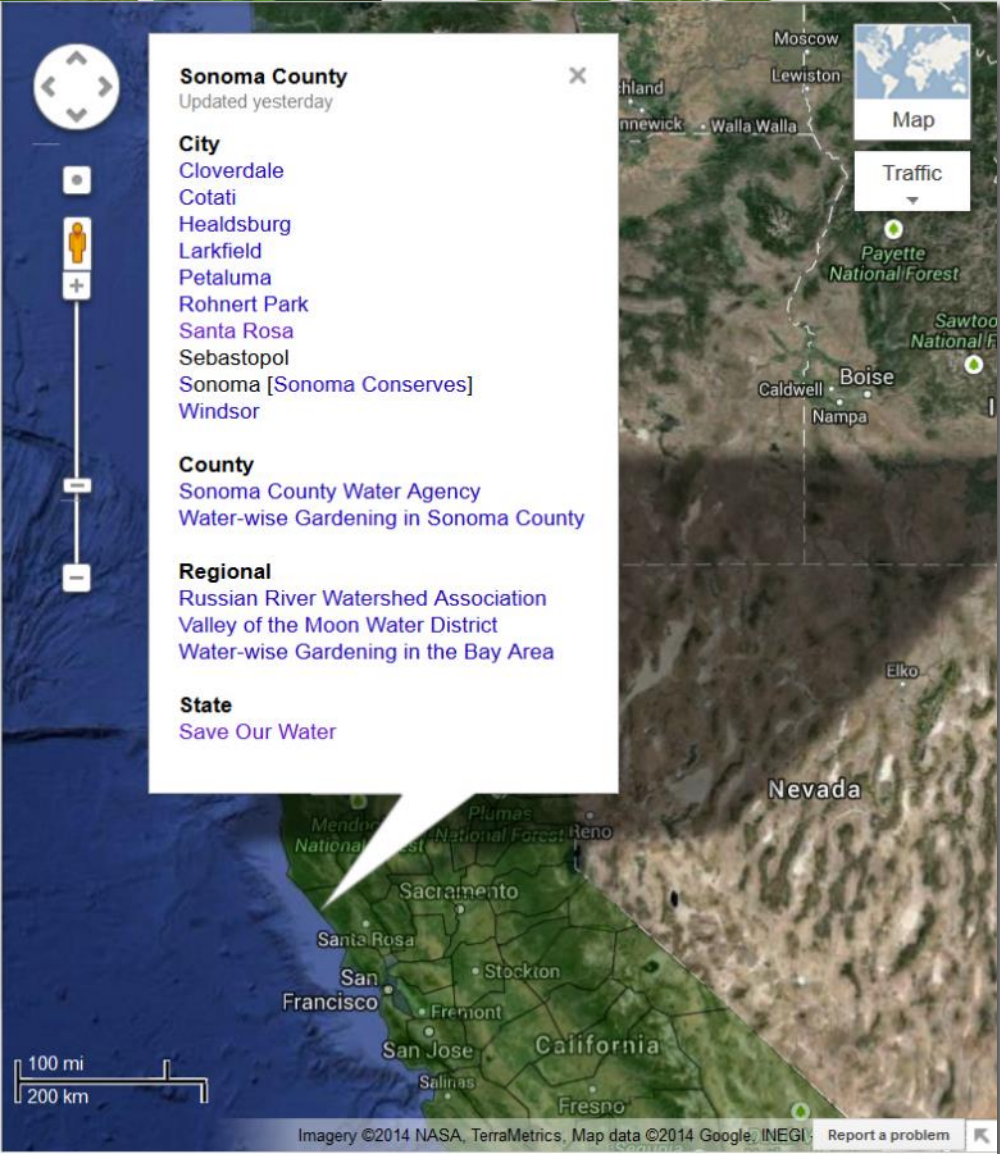
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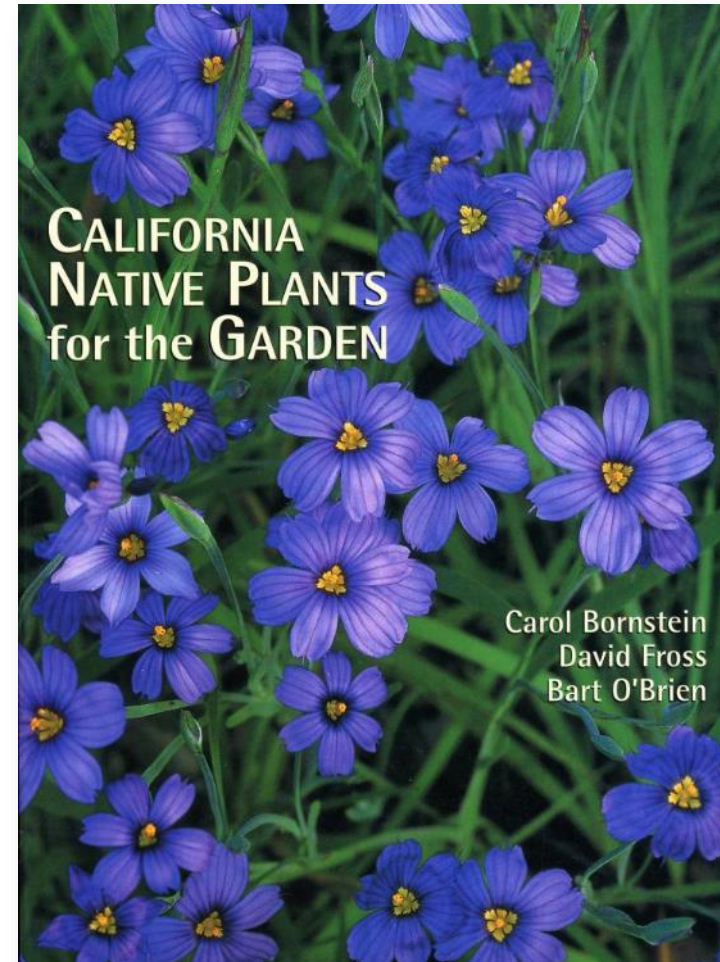
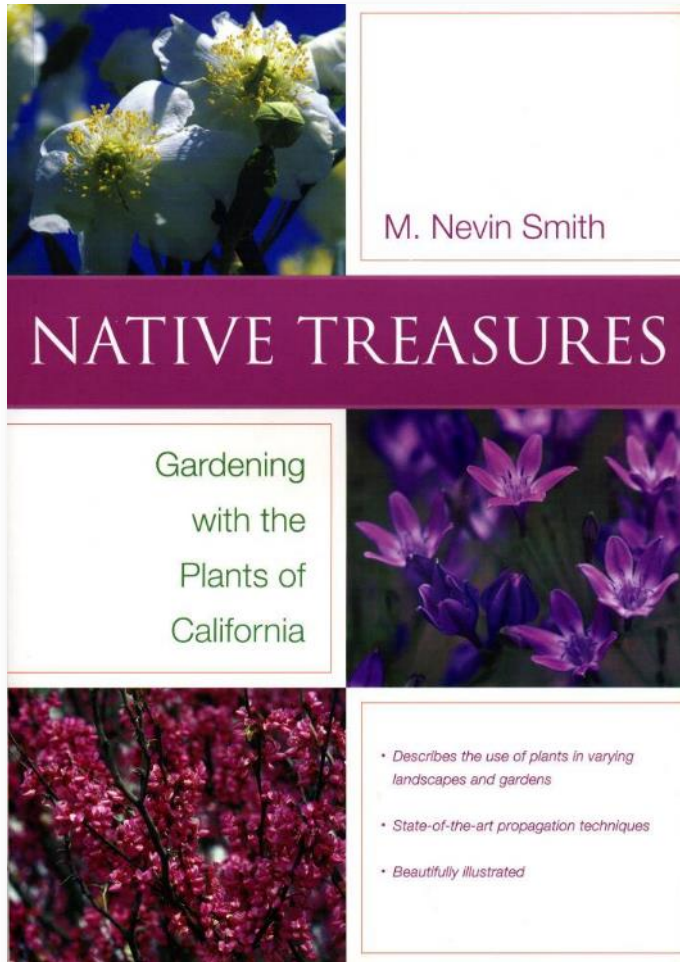
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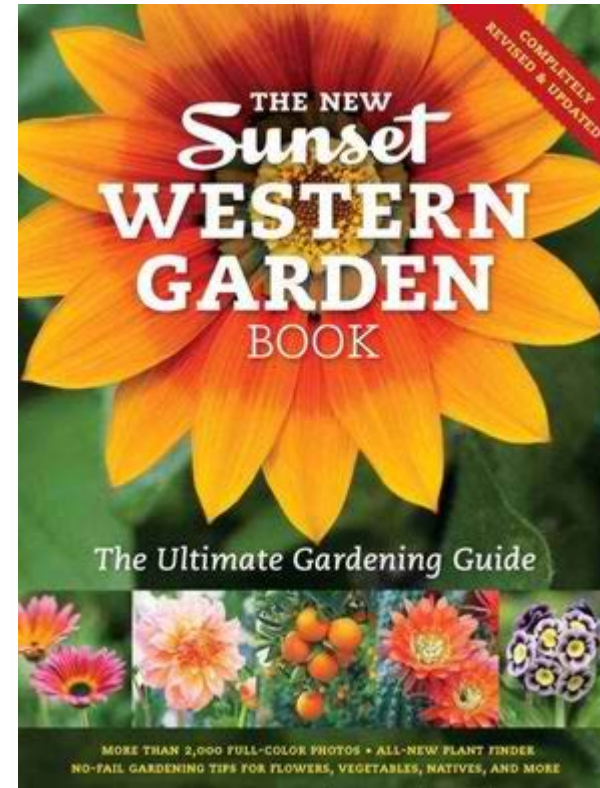
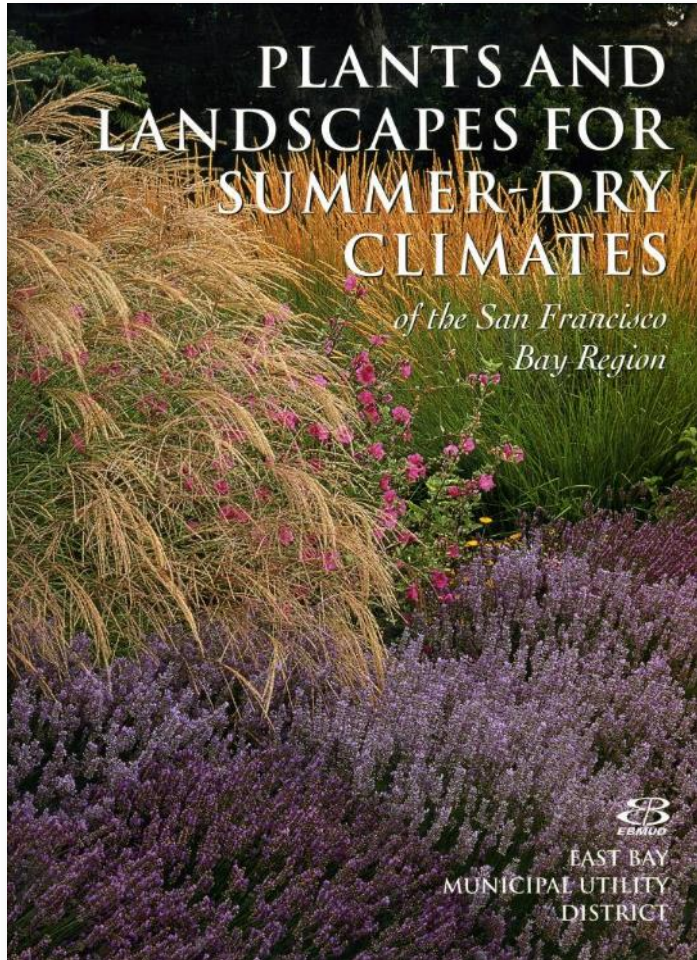
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[Save Our Water](#)



# Plant Selection Resources



# Plant Selection Resources





## THE WATERING INDEX

The current watering index = 71 %

- [About the Watering Index](#)
- [Santa Barbara County Residents](#)

## THE WATERING CALCULATOR

[Create your own custom watering schedule >>](#)

## California Friendly Garden Guide



The California Friendly Garden is a slice of California's past, filled with the native and California Friendly plants perfectly suited to our mild winters and warm, dry summers.

## Guide Features



### Gardens

Browse through a photo gallery of beautiful California Friendly gardens to find ideas for front yards, hillsides, patios and much more.



### Advanced Search

Use our powerful search function to look for plants by color of leaves or flowers, height, sun/shade requirements, soil type needed and blooming habits.



### Browse Our Catalog

Sift through our database of 1,000 California Friendly plants by type, function, characteristics or common or botanical names.



### My Plant List

Save your favorite plants in a customized plant list you can print out or access again.



### Garden Resources

## What is a California Friendly Garden?

### Today, California's California Friendly is rarely seen

because we have filled our landscape with palm trees, citrus groves and hibiscus, glorying in our ability to create tropical paradises and English gardens. In doing so, we changed the look, the feel, the smell and even the sound of our landscape.

**But the California Friendly Garden does exist**, and when we stumble upon one - in a neighbor's yard, a city's demonstration garden or at an institution such as Claremont's Rancho Santa Ana Botanic Garden - we find that the garden's natural rhythm allows us to step back in time, to find ourselves instantly at home and in harmony with the surrounding environment. It also gives voice to the land, allowing it to speak to us about the region we call home. And in doing so, the California Friendly Garden helps restore the sense of place too often lost in our urban settings.

**The California Friendly Garden links us to our past**, but also offers the path to our future. In this age of water restrictions and our unpredictable weather cycle, reducing outdoor watering is the surest solution. Native and California Friendly plants accomplishes this without sacrificing beauty.

# Water Saving Turf or Alternative Turf for Southern California

- Minimize the size of non-recreation lawn areas.
- Utilize warm season turfgrass species
  - Buffalo grass
  - Zoysia grass
  - Bermuda grass
- Utilize alternative plant species in non-recreation areas.
  - Yarrow (*Achillea* spp.)
  - Blue gramma (*Bouteloua gracilis*)
  - Sedges (*Carex pansa* or *C. tumuicola*)
  - Kurapia (*Lippia nodiflora* 'Kurapia')



**Buffalo grass**  
**'UC Verde'**



*Carex tumuicola*





# Session #6: Soil Health and Protection

April 5<sup>th</sup>, 2016