Planning a Low Water Landscape

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UC Cooperative Extension
August 26th, 2015
Outline

• Updating and changing irrigation
  • Hydrozoning
  • Delivery system (ex. sprinkler, drip, etc...)
  • Control system (i.e. smart clock)
  • Scheduling Adjustments

• Graywater Systems

• Native and Mediterranean Plants

• Alternatives to Turf

• Rainwater Collection
Updating & Changing Irrigation
Controller Types

• Time
• Weather (ET)
  • Uses weather information to estimate landscape water use
  • Adjusts irrigation program to replace water used by landscape
Controller Types

• Time
• Weather (ET)
• Soil moisture
  • Uses sensors to measure water content of the soil
  • Allows irrigation when soil is dry
Tested Products

Controllers, Climate-Based
Controllers, Sensor-Based
Rain Sensors

Tree Ring Irrigation Contraption (TRIC)

• Developed to irrigate trees during drought conditions, mainly where other landscape irrigation is turned off.
• Designed for applying water to significant depths.

Plant selection & design

• Hydrozones
  • Plants with similar water use within an irrigation zone
Graywater Systems
Native and Mediterranean Plants
Plant selection & design

• 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
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 of water needs, plant types, and climatic regions. It is necessary to know this information to perform WUCOLS evaluations and the plant search tool appropriately. To access the User Manual, click the 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 appearance, water conservation objectives can be achieved.
For more information, visit http://arboretum.ucdavis.edu/
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:** Select Common Name
- **Latin Name:** Select Latin Name
- **Plant Type:** Perennial
- **Flower Color:** Blue, Gold, Green, Lavender, Orange, Pink, Purple
- **Wildlife Value:** Attracts Beneficials
- **Exposure:** Full Sun, Full Sun or Part Shade, Afternoon Shade, Shade
- **Water Use:** Low
- **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.

[Click here for details on Erigeron 'Wayne Roderick']
‘Valley Violet’ California Lilac
Ceanothus maritimus
Field Testing
high, medium, and low water use

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.
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.
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 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).

Unlisted  4 Collaborators  6,273 views  Created on Mar 2, 2011  By UC Davis CAGES  Updated yesterday
Rate this map  Write a comment  KML

Sonoma County
Updated yesterday
City
Cloverdale
Cotati
Healdsburg
Larkfield
Petaluma
Rohnert Park
Santa Rosa
Sebastopol
Sonoma [Sonoma Conserves]
Windsor
County
Sonoma County Water Agency
Water-wise Gardening in Sonoma County
Regional
Russian River Watershed Association
Valley of the Moon Water District
Water-wise Gardening in the Bay Area
State
Save Our Water

Alameda County
City Alameda Albany Berkeley Dublin Emeryville Fremont Hayward Livermore Newark Oakland Piedmont Pleasanton San Leandro Union City County Alameda County Water District Bay-Friendly Landscaping Regi..

Alpine County
Regional Bear Valley Water District Kirkwood Meadows Public Utility District State Save Our Water

Amador County
City Amador City Ione Jackson Plymouth Sutter Creek County Water Conservation Tips Regional Kirkwood Meadows Public Utility District State Save Our Water

Butte County
City Biggs Chico Gridley Oroville [Cal Water] Paradise (Irrigation District) Regional Del Oro Water Company State Save Our Water

Calaveras County
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Sustainable Landscaping Information

NATIVE TREASURES
Gardening with the Plants of California
M. Nevin Smith

CALIFORNIA NATIVE PLANTS for the GARDEN
Carol Bornstein
David Fross
Bart O'Brien

- Describes the use of plants in varying landscapes and gardens
- State-of-the-art propagation techniques
- Beautifully illustrated
Sustainable Landscaping Information
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.
Alternatives to Turf
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
Rainwater Collection
Solutions for Rooftop Runoff

• Rain collection devices
  • Cisterns (underground or aboveground)
  • Availability has improved considerably.
  • Utilize captured water for irrigation during dry periods or use them to catch first flush minimizing pollutant loading to storm drains.
  • Check local water providers for rebate availability.

Source: Experiments in Sustainable Urban Living
Example: Roof Square Footage

= 500 square feet

1” of rain * (0.6) * 500 square feet

= 300 gallons

Average Orange County rainfall is approx. 12”

= 3,600 gallons

Source: Experiments in Sustainable Urban Living
Sustainable Landscaping Information

http://www.harvestingrainwater.com/
Local Ordinances
What is Required Locally?
Municipal Water District of Orange County

Mandatory Restrictions

The following activities are prohibited: Landscape irrigation that causes run-off; the washing of vehicles except where the hose is fitted with a positive shut-off nozzle; use of running water to clean paved or hard surfaces; operation of a fountain or other decorative water feature, except where the water is part of a recirculating system.

Read more

http://www.acwa.com/content/drought-mapr
Irvine Ranch Water District

Voluntary Measures

Asking customers to voluntarily reduce water use 20%.

At this time, IRWD will utilize an alternative method to discourage water wasters. IRWD will use the allocation-based conservation rate structure to limit outdoor watering. Rather than specifying which days a customer can water their yard, IRWD will assign each customer a monthly water budget. This approach complies with the new state emergency drought regulations and promotes long term behavior changes by sending a strong price signal that something is wrong, maybe a water leak or broken sprinkler timer. Customers are able to fix these problems and understand how they cause water over use.

The District offers financial incentives to customers to encourage the installation of high efficiency clothes washers and toilets, and turf replacement and continues to engage customers in innovative and creative ways to conserve water through customer communication programs.
Water Rates
### Example of 2008 Tiered Residential Allocation Based Rates*

<table>
<thead>
<tr>
<th>Tier</th>
<th>Potable Rate per CCF**</th>
<th>Use (% allocation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Volume</td>
<td>$0.91</td>
<td>0-40</td>
</tr>
<tr>
<td>Base Rate</td>
<td>$1.07</td>
<td>41-100</td>
</tr>
<tr>
<td>Inefficient</td>
<td>$2.14</td>
<td>101-150</td>
</tr>
<tr>
<td>Excessive</td>
<td>$4.28</td>
<td>151-200</td>
</tr>
<tr>
<td>Wasteful</td>
<td>$8.56</td>
<td>201 +</td>
</tr>
</tbody>
</table>

*Based on number of individuals in home (75 gallons/person/day) and the landscape allocation is adjusted daily based on evapotranspiration (ET) of 1300 square feet (0.03 acre) of **100% cool season turfgrass**.

*July 1, 2008 effective rates

**One ccf =748 gallons
Example of 2015 Tiered Residential Allocation Based Rates*

<table>
<thead>
<tr>
<th>Tier</th>
<th>Potable Rate per CCF**</th>
<th>Use (% allocation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Volume</td>
<td>$1.11</td>
<td>0-40</td>
</tr>
<tr>
<td>Base Rate</td>
<td>$1.62</td>
<td>41-100</td>
</tr>
<tr>
<td>Inefficient</td>
<td>$3.92 ($9.30 step 2)</td>
<td>101-130</td>
</tr>
<tr>
<td>Excessive</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Wasteful</td>
<td>$14.53 ($19.92 step 2)</td>
<td>131+</td>
</tr>
</tbody>
</table>

- Based on number of individuals (4 default) in home (50 gallons/person/day) and the landscape allocation is adjusted daily based on evapotranspiration (ET) of 1300 square feet (0.03 acre) using a crop coefficient of 50% of ET and an irrigation efficiency of 85%.

*July 1, 2015 effective rates

**One ccf = 748 gallons

Allocation Calculation:
\[ ET \times K_c \times 1.18 \times LA \]
Basics of Local ‘Cash for Grass’ Programs

http://socalwatersmart.com/
SAVE THE DATE!
SEPTEMBER 26, 2015
9AM-2PM

URBAN LANDSCAPE & GARDEN EDUCATION EXPO
A free event hosted by the
UC ANR South Coast Research & Extension Center
7601 Irvine Blvd. Irvine, 92618

http://ucanr.edu/sites/urbanwatermgmt/
Follow the Action! Get to know our Spokesgnome

Follow OC's spokesgnome on his adventure to help keep water in the yard, not the sidewalk.

OverwateringIsOut.org

http://www.overwateringisout.org/
