

University of California Cooperative Extension

# Demonstration Landscapes



University of California  
Agriculture and Natural Resources



UC  
CE

# UC ANR South Coast Research and Extension Center Demonstration Landscapes

Research and Extension Centers serve the University of California's Cooperative Extension program, which began in 1913, as a way to connect university research to the public. The concept was this: What good is groundbreaking agricultural science if you can't communicate it to the farmers and consumers and taxpayers who utilize and help fund the research?

Over the years, the university stationed scientists at several centers throughout the state - in rich valleys, on dry deserts, on foggy coasts. The various ecosystems are excellent for field testing a wide range of projects and the far-flung locations help scientists stay in touch with the needs and people the university serves.

Throughout their history, Research and Extension Centers have produced amazing advances. For example, California's strawberry industry was saved in the 1940s when UC scientists developed a virus-resistant plant. Nearly 80 percent of the strawberries planted in California are varieties that UC scientists developed.

As one of the nine centers located in California, the South Coast Research and Extension Center (SCREC) was established by the University of California in 1956 as a representative site for agricultural research in California's south coastal plain-temperate climatic zone. Located on 200 acres of deep, moderately sloped, alluvial fan soil, the center and its mild winter climate are conducive to farming a wide range of crops including subtropical.

The center also provides labor, equipment, facilities and technical and management support to UC academics and to personnel from co-operating non-UC organizations, such as USDA.

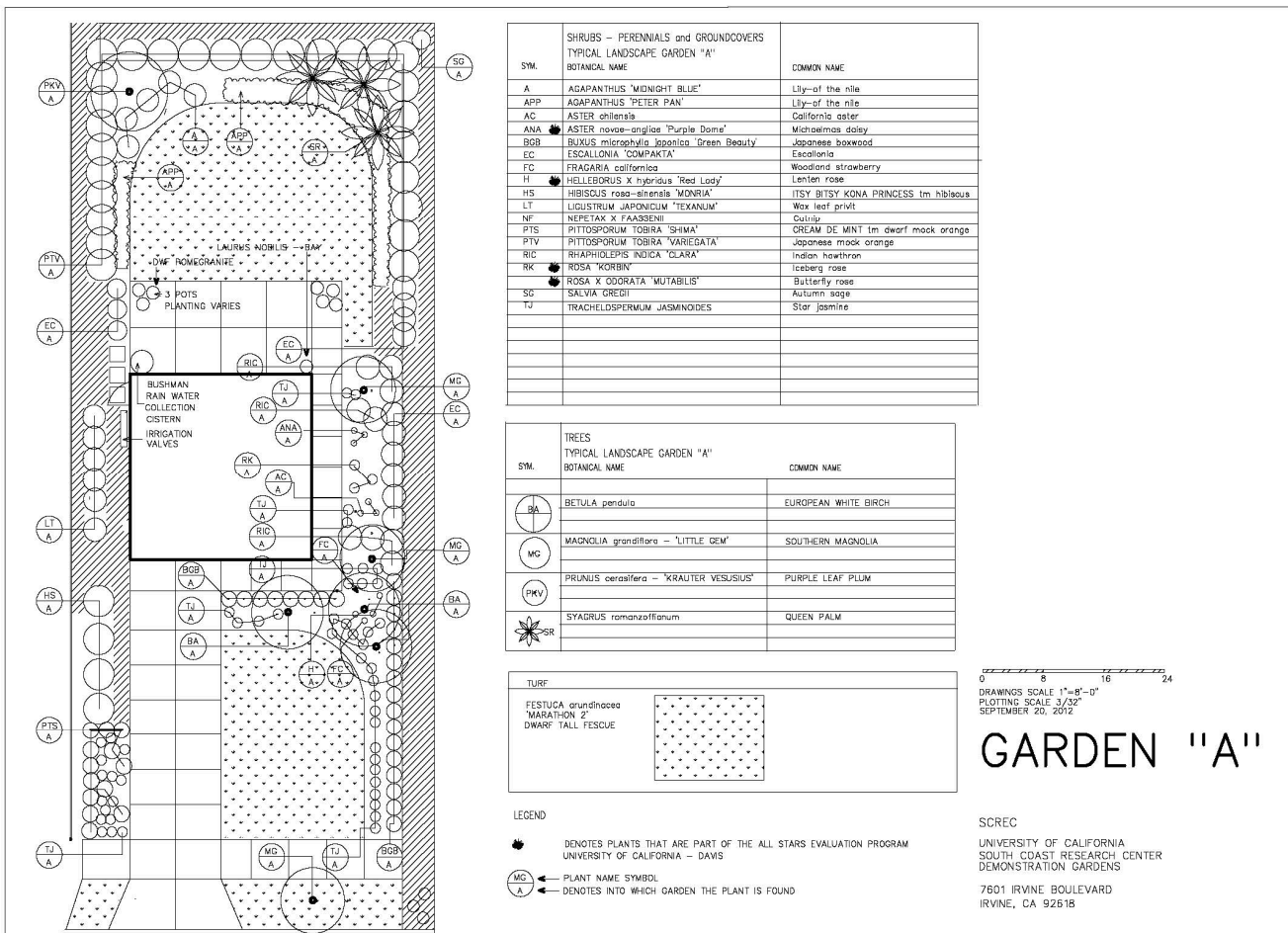
In addition to research, outreach is extended to the general public and private entities through various events such as "field days" featuring project tours and presentations; taste testing events showcasing center grown fruit; and workshops focusing on various subjects ranging from pesticide application training to compost to better landscape practices and water quality.

One of the Center's focal points are the demonstration landscapes which were established in 2006 to showcase methods which improve water quality and promote water conservation within the urban landscape. Centered around the landscapes, the UC Cooperation Extension Water Quality Program focuses on reducing urban and agricultural runoff, along with improving the water quality of local watersheds.

# LANDSCAPE A

"Typical" Urban Residential Landscape consisting of:

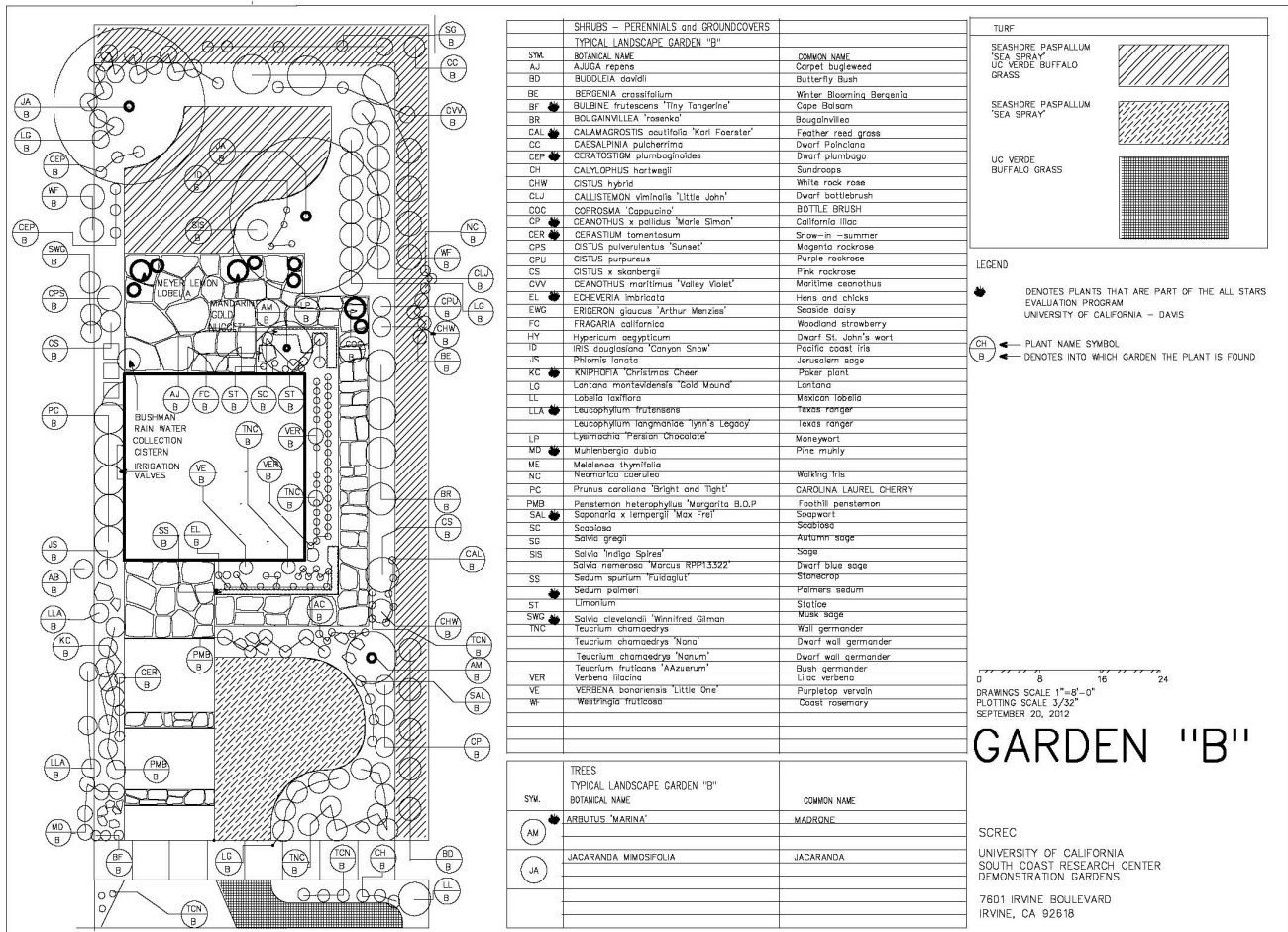
- Widely used plant species requiring regular irrigation
- Cool season tall fescue turf (Marathon II)
- Concrete driveway, walkways and patio
- Landscape drains are connected directly to street
- Automatic irrigation timer
  - Controls 4 irrigation zones
  - Standard spray heads (1.5 to 2" per hour)



# LANDSCAPE B

Low Impact landscape (Type 1) consisting of:

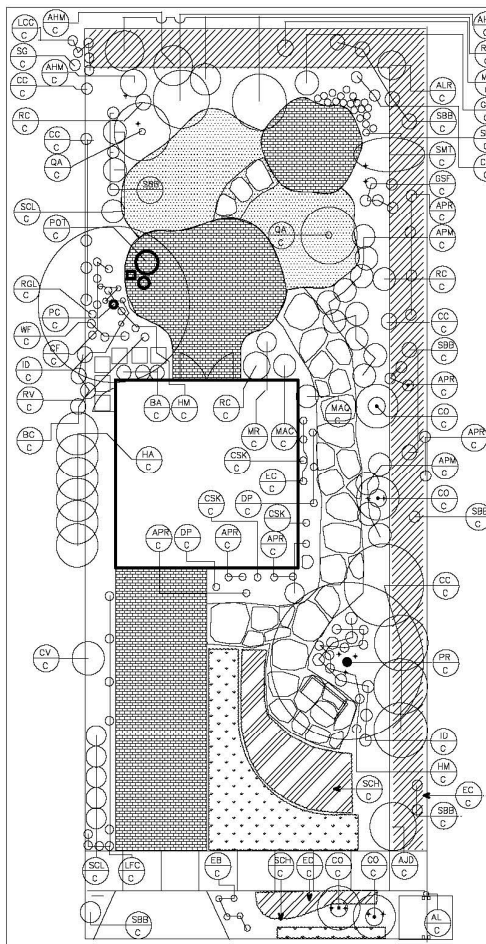
- Mediterranean plant species
- Warm season turfgrass species
  - 'UC Verde' buffalo grass
  - 'Sea Spray' seashore paspalum
- Slot drains added to driveway
- Flagstone walkways and patio set in decomposed granite
- Rain harvesting from roof
- Low flow spray heads in turf (.35" to .50" per hour)
  - 8 Soil moisture sensor zones
  - 10 Hydrozones



# LANDSCAPE C

Low Impact Landscape (Type 2) consisting of:

- Predominantly native species
- Meadow grass (Carex species in front and back)
- Interlocking pavers
- Flagstone walkway in decomposed granite (DG)
- Dry well to capture and infiltrate roof runoff
- SMART controller with weather station
- Combination of drip and micro-spray heads irrigation
  - 24 Hydrozones
  - Automatic Irrigation Timer
- Underground infiltration device to capture and infiltrate roof runoff



SHRUBS - PERENNIALS and GROUNDCOVERS  
TYPICAL LANDSCAPE GARDEN "C"

SYM.	BOTANICAL NAME	COMMON NAME
AHM	ARCTOSTAPHYLOS densiflora 'HOWARD MCMINN'	Vine Hill manzanita
AJD	ARCTOSTAPHYLOS 'JOHN DOURLEY'	SUNSET MANZANITA
AL	ANTIGNONON LEPTOPUS	CORAL VINE
ALR	ARCTOSTAPHYLOS 'LESTER ROUND TREE'	MANZANITA
APM	ARCTOSTAPHYLOS 'ves-und' 'PACIFIC MIST'	MANZANITA
APR	ARCTOSTAPHYLOS 'POINT REYES'	MANZANITA
BA	BERBERIS AQUIFOLIUM 'COMPACTA'	COMPACT OREGON GRAPE
BC	BERGENIA CRASSIFOLIA	WINTER BLOOMING BERGENIA
BD	BUDDLEIA DAVIDII 'PETITE INDIGO'	BUTTERFLY BUSH
CC	CEANOTHUS 'CONCHA'	California lilac
CF	FESTUCA CALIFORNICA	CALIFORNIA FESCUE
CO	CERCIS OCCIDENTALIS	WESTERN RED BUD
CSK	CEANOTHUS 'SKYLARK'	CEANOTHUS 'WILD LILAC'
CV	CEANOTHUS 'VARIEGATA'	VARIEGATED CEANOTHUS
CVV	CEANOTHUS 'VALLEY VIOLET'	VALLEY VIOLET CEANOTHUS
DD	DAPHNE OODORA AUROMARGNATA	WINTER DAPHNE
DP	DUDLEYA ORTONII	CHALK DUDLEYA
EB	ERIGERON 'BOUNTIFUL'	BEACH ASTER
EC	EPILOBIUM CALIFORNICA	CALIFORNIA FUSCHIA
GSP	GALVEZIA SPECIOSA 'FIRECRACKER'	ISLAND BUSH SNAPDRAGON
HA	HETEROMELIS ARBUSTIFOLIA	TOYON
HHY	HEUCHERA HYBRID mixed natives from T of L	ISLAND ALUM ROOT
HM	HEUCHERA MAXIMA	ALUM ROOT
H	HEUCHERA 'Green Spice'	Coral bells
H	HEUCHERA 'Purple Pasticcots'	Coral bells
H	HEUCHERA 'Silver Sorrel'	Coral bells
H	HEUCHERA 'Swirling Fantasy'	Coral bells
ID	IRIS DOUGLASSIANA 'Canyon Snow'	Pacific coast Iris
LCC	LEYMUS CONDENSATUS 'CANYON PRINCE'	GIANT WILD RYE
LFC	LESPEDeza FILICIFOLIA v. CALIFORNIA	DANDEL ASTER
MA	MIMULUS AURANTIACUS	Shibby monkey flower
MAC	MAHONIA AQUIFOLIUM 'COMPACTUM'	Compact Oregon grape holly
MAQ	MAHONIA pinnata	California holly grape
MRE	MAHONIA REPENS	CREeping BARBERRY
PMB	PENSTEMON 'Margarita BGP'	FootHill penstemon
RC	RHAMNUS CALIFORNICA 'Eve Case'	COFFEE BERRY
RL	RIBES MALVACEUM 'DANCING TASSELS'	CHAPARRAL CURRENT
RV	RIBES VIBURNIFOLIUM	Evergreen current, catalina perfume
SB	SISYRINCHIUM BELLUM	BLUE EYED GRASS
SBB	SALVIA 'BEES BLISS'	GERMANDER SAGE
SCH	SALVIA CHAMAEDRYOIDES	ELECTRIC BLUE SAGE
SCL	SALVIA CLEVELANDI 'Alien Chickering'	CLEVELAND SAGE
SG	SALVIA GREIGI	AUTUMN SAGE
SMT	SALVIA MELIFERA 'TERRA SECCA'	TERRA SECCA SAGE
SWG	SALVIA 'WINIFRED GILMAN'	WINIFRED GILMAN SAGE
WF	WOODWARDIA FIMBRATA	WOODWARDIA FERN

LEGEND

- DENOTES PLANTS THAT ARE PART OF THE ALL STARS EVALUATION PROGRAM UNIVERSITY OF CALIFORNIA - DAVIS
- RC (circle with RC) ← PLANT NAME SYMBOL
- C (circle with C) ← DENOTES INTO WHICH GARDEN THE PLANT IS FOUND

SYM.	TREES	COMMON NAME
	TYPICAL LANDSCAPE GARDEN "C"	BOTANICAL NAME
(UK)	CERCIS OCCIDENTALIS	WESTERN REDBUDD
(PR)	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE
(PC)	PROSOPIS CHILENSIS	CHILEAN MESQUITE
(D)	QUERCUS AGRIFOLIA	COAST LIVE OAK

TURF

- CAREX PRAEGRACILLIS
- CAREX TUMILICOLA (DIVULSA)
- CAREX TUMILICOLA (DIVULSA)

0 6 12 18 24  
DRAWING SCALE 1"=8'-0"  
PLOTING SCALE 3/32"  
SEPTEMBER 20, 2012

## GARDEN "C"

SCREC  
UNIVERSITY OF CALIFORNIA  
SOUTH COAST RESEARCH CENTER  
DEMONSTRATION GARDENS  
7601 IRVINE BOULEVARD  
IRVINE, CA 92618

# **STRUCTURAL AND NON STRUCTUAL BEST MANAGEMENT PRACTICES**

## **Structural:**

To increase permeability within the hardscape, you may replace impervious concrete with one of the following variations:

- Add Flagstone to driveways with slot drain at low side.
- Install flagstone walkways and patios, set on Class II base and sand, joints filled with stabilized decomposed granite.
- Use concrete interlocking pavers for drive and patio set over Class II base and sand with sand swept joints

To improve drainage utilize any of the following:

- 4" solid drain line daylighting to gravel filled sump.
- Slot drains at flagstone bands at driveway capturing surface runoff.
- Rainbarrel collection from roof gutters.
- 4" perforated drain line in 6" gravel trench to maximize percolation and minimize runoff.
- Flow well sumps connected to roof gutters.

Irrigation runoff may be controlled by:

- Low flow spray nozzles with matched precipitation rates for greater uniformity.
- ET based controllers.
- Drip irrigation to trees, shrubs and groundcovers.
- Subsurface emitter tubing for turf areas.

## **Nonstructural:**

To reduce sediment and water runoff and improve ground filtration you may:

- Use of more drought tolerant shrubs and groundcovers placed in hydrozones, predominately native plants.
- Use vegetative buffers next to impervious surfaces.

Prevent excess pesticide runoff by:

- Use of bait stations rather than broadcast spraying of pesticides.
- Use of biopesticides.
- Use of nonpersistent pesticides.

### **Landscape Water Use:**

	Average Daily Water Use	Average Daily Water Runoff
Landscape A	526 gallons	14 gallons
Landscape B	328 gallons	4 gallons
Landscape C	202 gallons	4 gallons

# BETTER GARDENING PRACTICES FOR WATER CONSERVATION AND TO IMPROVE WATER QUALITY ORANGE COUNTY RESOURCE GUIDE

## PLANT DATABASES and INSPIRATION

IRWD RightScape	<a href="http://www.rightscapenow.com">www.rightscapenow.com</a>	Plant, landscape design, and irrigation information, <b>rebates</b> , events, classes
Bewaterwise.com	<a href="http://bewaterwise.com/garden.html">http://bewaterwise.com/garden.html</a>	Plant database and photos
UC Davis Arboretum All-Stars	<a href="http://arboretum.ucdavis.edu/arboretum_all_stars.aspx">http://arboretum.ucdavis.edu/arboretum_all_stars.aspx</a>	Plant database and photos, design
Monrovia Nursery	<a href="http://www.monrovia.com">www.monrovia.com</a>	Plant database
Mountain States Wholesale Nursery	<a href="https://mswn.com/plant-database/">https://mswn.com/plant-database/</a>	Plant database
Sunset Magazine	<a href="http://www.sunset.com">www.sunset.com</a>	Plant, landscape design information

## LOCAL SOURCES FOR NATIVE AND CALIFORNIA FRIENDLY LANDSCAPES

Tree of Life Nursery	(949) 728-0685 – limited hours, call first	<a href="https://californianativeplants.com/">https://californianativeplants.com/</a>
Green Thumb	(949) 837-3040	<a href="https://www.greenthumb.com/green-thumb-nursery-lake-forest-location/">https://www.greenthumb.com/green-thumb-nursery-lake-forest-location/</a>
Plant Depot	(949) 240-2107	<a href="http://www.plantdepot.com">www.plantdepot.com</a>
Rogers Gardens	(949) 640-5800	<a href="http://www.rogersgardens.com">www.rogersgardens.com</a>
Village Nurseries	(714) 998-8751	<a href="https://www.villagenurserieslc.com/">https://www.villagenurserieslc.com/</a>

## IRRIGATION MANAGEMENT

Ca. Landscape Contractors Assoc.	<a href="http://www.clca.org/">http://www.clca.org/</a>	Contractors for hire
Bewaterwise.com	<a href="http://bewaterwise.com/toolkit.html#water-saving-tips">http://bewaterwise.com/toolkit.html#water-saving-tips</a>	Irrigation and water saving tips
Smartwater Application Technology	<a href="http://www.irrigation.org/SWAT">http://www.irrigation.org/SWAT</a>	“Smart” irrigation information
Hunter Industries	<a href="https://www.hunterindustries.com/">https://www.hunterindustries.com/</a>	Irrigation products, ‘How-To’ video
Rain Bird	<a href="https://www.rainbird.com/homeowners">https://www.rainbird.com/homeowners</a>	Rotary /Micro Spray Head information
Toro Irrigation	<a href="https://www.toro.com/en/irrigation">https://www.toro.com/en/irrigation</a>	Irrigation products, ‘How-To’ video
Ewing – Lake Forest, CA	<a href="https://store.ewingirrigation.com/store-38-lake-forest/">https://store.ewingirrigation.com/store-38-lake-forest/</a>	Specialty Irrigation Supplies
Horizon Irrigation – Santa Ana, CA	<a href="https://www.horizononline.com/stores/santa-ana/">https://www.horizononline.com/stores/santa-ana/</a>	Specialty Irrigation Supplies

## BULK SOURCES FOR ORGANIC MULCH AND GREEN WASTE DIVERSION

Tierra Verde Industry	<a href="http://www.tierraverdeind.com/">http://www.tierraverdeind.com/</a>	Bulk purchase, green waste diversion
Aguinaga Green	<a href="http://www.aguinagagreen.com/">http://www.aguinagagreen.com/</a>	Bulk purchase of mulch, top soil
Orange County Farm Supply	<a href="https://www.ocfarmssupply.com/">https://www.ocfarmssupply.com/</a>	Bulk bags at reduced prices

## O.C. HAZARDOUS WASTE COLLECTION

Integrated Waste Management	<a href="http://www.oclandfills.com">www.oclandfills.com</a>	OC Waste & Recycling
Irvine Regional HHWCC	6411 Oak Canyon Irvine, CA	Household Hazardous Waste Center
Prima Deshecha Landfill	32250 La Plata Ave San Juan Capistrano	Household Hazardous Waste Center

## EQUIPMENT RENTAL/SERVICES – South Orange County

Home Depot	<a href="http://www.homedepot.com">www.homedepot.com</a>	Rental of aerators, tillers, etc.
Parkway Lawnmower Shop	<a href="https://www.parkwaylawnmower.com/">https://www.parkwaylawnmower.com/</a>	Blade sharpening, repairs
Goldenwest Lawnmowers	<a href="https://www.goldenwestlawnmowers.com/">https://www.goldenwestlawnmowers.com/</a>	Blade sharpening, repairs
Jave Lawnmower Services Center	<a href="https://www.anaheimjavelawnmower.com/">https://www.anaheimjavelawnmower.com/</a>	Blade sharpening, repairs

## LANDSCAPE PEST AND GENERAL GARDEN RESOURCES

Univ. of CA Cooperative Extension OC	<a href="http://ceorange.ucanr.edu/">http://ceorange.ucanr.edu/</a>	Public educational programs
OC UCCE Master Gardeners	<a href="http://mgorange.ucanr.edu/">http://mgorange.ucanr.edu/</a>	Gardening hotline, classes, events
UC Statewide IPM Services	<a href="http://www.ipm.ucdavis.edu/">http://www.ipm.ucdavis.edu/</a>	Integrated Pest Mgmt. & Publications
OC Agricultural Commissioner	<a href="http://www.ocagcomm.com">http://www.ocagcomm.com</a>	Pest identification
CDFA Integrated Pest Control Branch	<a href="http://www.cdca.ca.gov/phpps/ipc">www.cdca.ca.gov/phpps/ipc</a>	Information on exotic pests in CA.
Anaheim Test Lab	<a href="https://www.anaheimtestlab.com/anaheim-test-laboratory/">https://www.anaheimtestlab.com/anaheim-test-laboratory/</a>	Diagnostics, soil, plant nutrient analyses
Way Point Analytical CA, Inc	714-282-8777, <a href="http://waypointanalytical.com/">http://waypointanalytical.com/</a>	Diagnostics, soil, plant nutrient analyses
H2OC Stormwater Program	<a href="https://h2oc.org/">https://h2oc.org/</a>	Gardening, rebate, and event information

## WEATHER SERVICES

AccuWeather	<a href="http://www.accuweather.com">www.accuweather.com</a>	Hourly and extended forecasts
National Weather Service	<a href="http://www.nws.noaa.gov/">http://www.nws.noaa.gov/</a>	Detailed forecast and maps, rainfall totals

## **FREQUENTLY ASKED QUESTIONS**

### ***I want to change to a more drought tolerant garden but over time. Where should I start?***

Evaluate the current landscape, determine your budget and what changes may be incorporated such as plant material, irrigation, and hardscape. As annual and older plant material dies out replace with water conserving perennials as budget, time and space allows.

***What costs are involved in replacing my lawn with drought tolerant plants?*** This would vary based on design and budget.

***Where can I buy drought tolerant plants?*** Locally there is Tree of Life, Green Thumb, and Rogers Garden to name a couple. Many nurseries now have a section dedicated to drought tolerant plants.

### ***What drought tolerant plants attract bees, butterflies and other beneficial insects to the garden?***

Verbena, Lantana, California Poppy, Butterfly Brush, Salvia, Rosemary, Penstemon to name a few. Nurseries specializing in drought tolerant plants can assist you in choosing those of special attraction to bees, butterflies and beneficials.

***Do the drought tolerant plants turn brown in the summer?*** Yes, some will go dormant even if they are watered. However, there are many species that will suppress dormancy with supplemental water during the summer months.

***Is the water from the rain barrel safe to use on plants?*** Yes, depending on the safety specs of materials used on your particular roof. It is also best to keep gutters clear of debris which may harbor any potential toxins.

***I want to replace my lawn with ground cover. How do I remove it?*** The least labor intensive method to kill the existing lawn and weeds is to apply a nonselective herbicide, such as glyphosate, over the entire area. Glyphosate is a postemergence translocated herbicide that effectively kills turf and grassy and broadleaf weeds. Glyphosate is translocated rapidly in all actively growing plants. Make applications when your turf is actively growing. Do not water within 48 hours after treatment. Though the plants absorb the herbicide rapidly, do not disturb for 7 days. It may take up to 7 days after the application for the grass to completely absorb the material and for symptoms to show. Depending on temperature, it can take up to 2 weeks for the entire lawn to die.

If you do not wish to use herbicides, you can dig out the existing lawn and solarize the soil. Alternatively you can lightly moisten the soil and rototill it. You may need to till the soil several times to remove all of the turf and weeds, raking up the debris in between tilling.

If you applied herbicides, mow the dry grass at a very low setting, so that the blade is cutting just above the soil line. Rake up the clippings. A thatching rake can help to loosen the debris on the soil surface. If you dug out the lawn or rototilled the soil, remove the debris by raking the soil. Additional tilling and raking may be necessary until all the grass and weeds are removed.

***How can I maintain a landscape without a lawn? My lawn guy won't know what to do.*** It is best to plant what you are comfortable with or find a new landscape maintenance company that is more familiar with your type of landscape design. Contact the California Landscape Contractors Association for more information on contractors and landscape maintenance companies.

***I still want a lawn. What types would require the least amount of water?*** Most warm season grasses such as Paspalum, Zoysiagrass, 'UC Verde' Buffalograss, Bermudagrass, and St. Augustine.

***What are the benefits of "UC Verde" Buffalograss?*** Water use can be cut down as much as 75%, mowing requirements will be reduced by as much as half and it is nearly pest and disease free, meaning very little need for insecticides and fungicides.



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**What is the best time to plant “UC Verde” Buffalograss?** As a warm season turf, April through August is the best time to plant taking advantage of the warmer soil and temperature. It can be planted at other times of the year but will require additional time to establish as warm season turf grows slower in cooler months or goes partially dormant.

**Does “UC Verde” Buffalograss go dormant?** For much of Southern California it does go semi-dormant during the months of early December to mid-February at which time it becomes straw green in color.

**Can “UC Verde be grown from seed?** Planted in plugs, it is a female-sterile grass and does not reproduce from seed since the pollen count is so low.

**How well does Paspalum withstand foot traffic and how difficult is weed control?** Because it grows low to the ground, it has a high tolerance for traffic and wear. It grows rapidly which provides a thick turf and competes against weeds when maintained properly.

**How and when is Paspalum planted?** Paspalum can be planted by seed, sod, or stolons; and is best established during the time of most active growth when temperatures are above 70f.

**Where can I purchase “UC Verde” Buffalo and Paspalum grasses?** “UC Verde” Buffalo grass can be ordered from sources such as *Florasource* and *Armstrong Nursery*. Paspalum may be purchased from *West Coast Sod*.

**I have a cement patio and walkway. What changes can I make to my hardscape that will help conserve water?**

Utilize permeable materials which allow the absorption of stormwater through the surface (in addition to reducing runoff, this effectively traps suspended solids and filters pollutants from water that may drain off the property.) such as pavers for patios, bricks, river rock, pebbles and pea gravel. Permeable hardscape, such as decomposed granite pathways or widely spaced flagstone set in sand, decomposed granite or mulch, will also absorb irrigation and rain water.

**Can I add water collectors to an existing cement driveway?** Yes, depending on your hardscape design. Contact the California Landscape Contractors Association for a company familiar with hardscape work.

**What is a hydrozone?** A group of plants with the same watering requirements.

**I have a standard sprinkler system. Do I have to replace it with a drip system?** No, it is not absolutely necessary to go to a drip system which can be costly and will require constant, regular maintenance. There are other low water use alternatives such as Netafim, matched precipitation rate spray heads (MP Rotators), and RainBird micro-spray emitters, to name a few.

**I see some plants in the landscapes tagged “All Stars”. What does that mean?** The South Coast REC is one of the evaluation sites located throughout California which observe, for a minimum of three years, the various plant material on the UC Davis Arboretum “All-Star” plant list to determine the best species for those

areas, using set criteria as a guideline for growers and consumers alike. The UC Davis Arboretum has been reaching out to the gardening public for years with advice on plant choices for low-maintenance, drought tolerant home gardens. They have developed a list of “All Stars” - plants that had grown for years in the Arboretum’s hot, dry summer climate with few or no pest and disease problems on a low-water regimen. Many of these plants are California native species, while others are from other similar “Mediterranean” climates. To qualify as an All-Star, plants had to fit the above criteria as well as be considered by the average gardener generally attractive for most of the year. In addition, these plants often attract beneficial insects or birds.



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