

Drought Tolerant Plants

Benefits of Drought Tolerant Plants

- Lower water bills
- Reduce water use
- Attractive plants with less maintenance
- More wildlife habitat
- Less plant disease and more pest resistance
- Deeper roots help to stabilize slopes
- More groundwater recharge
- Less polluted runoff flowing to the ocean



Drought tolerant plants such as this Red Bird of Paradise (*Caesalpinia pulcherrima*) lend a colorful tone to this Southern California garden.

Landscaping and Drought

This **Green Sheet** provides some basic information about drought tolerant plants to get you started on a water friendly yard and garden. On the last page are a variety of excellent resources to take you further.

Southern California's sunshine and mild climate provide a gardener's paradise. Homeowners' attraction to lush landscaping is reflected in their water use. Almost half of household water in Southern California is used in the yard, amounting to an average of 238 gallons per day for a family of four. This enormous demand far exceeds the modest 10-15 inches of annual rainfall our Mediterranean climate provides. Over-watering is common and results in pesticide and fertilizer-laden water running into rivers, streams and, ultimately, the ocean. We also end up relying heavily on imported water resources. Many Southern California residents, such as those in Los Angeles, Long Beach and San Diego, are now facing restrictions on water use, particularly for landscaping and garden purposes. Although periods of water rationing are familiar to Californians due to California's natural drought cycles, climate models predict that climate change will worsen water shortages. Additionally, as our population continues to increase, water demand could further outstrip natural water availability.

While we all need to work to reduce water use in the landscape and its resulting runoff, gardening in dry conditions does not mean reducing yards to barren concrete slabs with occasional potted cacti dotting the landscape. Instead, reducing lawn areas and devoting more landscape area to groundcovers, shrubs and trees that are drought tolerant can be visually appealing and provide a host of environmental and economic benefits. Gardens with low water requirements can include a diverse array of colorful and interesting plants, enticing to native birds and butterflies.

History

Drought tolerant plants have been used as an integral element in gardens and landscaping for hundreds of years. Some of the earliest examples could be found in fifth- and sixth-century Persian gardens, as well as Moorish gardens from the thirteenth century, where water played a primary role in their design and function. Since water was in short supply in these dry, hot climates, it was managed with great care. Plants were chosen that functioned best under low-water conditions while at the same time helped to create an oasis-like environment. Southern California homeowners can apply this ancient principal today by using drought-tolerant trees, shrubs and groundcovers in their own gardens and landscapes.



Drought tolerant plants like this Texas Mountain Laurel (*Sophora secundiflora*) can reduce your water bill and provide shade and beauty. L.A. County Arboretum, Arcadia.



Cacti and succulents provide a stunning focal point to a drought tolerant garden. L.A. County Arboretum, Arcadia.

Drought Tolerant Plant Characteristics

Drought tolerant plants must be able to withstand low water and high-heat conditions while still maintaining their aesthetic and functional qualities. Plants that thrive in naturally dry conditions sometimes have small or divided leaves that are waxy or hairy. These characteristics help plants hold in moisture, reducing water loss through transpiration. Sometimes the leaves are spiny, or lack leaves entirely. Other plants survive drought by special internal mechanisms that enable them to minimize water loss through transpiration as well. Some drought tolerant plants survive periods of reduced summer water by going dormant and then resuming growth during the winter and spring. Many low-water-use plants actually avoid drought by producing wide-spreading or long roots to reach stored groundwater. These extensive root systems can also be beneficial for hillside stabilization. A variety of species on a slope – trees, shrubs, and perennials - will provide a range of root depths to help bind soil and rocks together.

Many drought-tolerant plants can be useful in areas of high fire danger. Some dry land plants are low-growing with a creeping or spreading habit; this low foliage along with open branching, limited leaf litter, and low quantities of flammable oils or resins contribute to fire-resistance. Be sure to water these plants as needed to maintain moisture.

A plant's natural growing conditions contribute to its appearance and characteristics. A drought tolerant plant that thrives in dappled shade may have large, leathery leaves, whereas a plant that prefers full sun may have smaller, firmer foliage. Plants in high-heat areas may be drought-deciduous and lose their foliage altogether during times of low water. Leaf color generally depends on light exposure and tends to be lighter, silvery, or greyish for plants that live in full sun; plants from more shaded areas generally are darker.

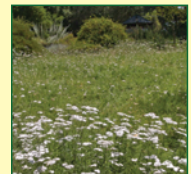
Selecting Plants

One group of flora perfectly suited to our climate's low precipitation is the wide assortment of native Southern California plants. Native species have evolved and adapted to the local weather over thousands of years. In their native habitat, they are tolerant of seasonal extremes, having adapted to survive winter cold and summer heat, periodic drought, wildfires, coastal conditions and high winds. Once established, many native species require little or no additional irrigation beyond normal rainfall. For more information about native plants, visit California Native Plant Society's website at <http://cnps.org>.

Another group of California-friendly plants are from Mediterranean-climate regions. This includes species from the Mediterranean Basin, South Africa, southwest Australia, and Central Chile. These plants use water-conserving techniques that allow them to withstand long, hot summers. When using any non-native plants, care must be taken to choose species that will not escape into the wild and displace native species. Many invasive plants have aggressively invaded California's wildlands, outcompeting native species for water and other resources.

Drought Tolerant Lawn Alternatives





- Yarrow
- Blue Grama
- Seaside Daisy
- Alpine Strawberry
- Texas Meadow Sedge
- Creeping Red Fescue - *needs shade in hotter areas*







A Selection of Drought Tolerant Plants for Southern California

Ground Covers

Dymondia   

Creeping Barberry    

Rockrose  

California Poppy  



Vines




Bougainvillea    



Jasmine  



California Wild Rose   



Shrubs/Perennials

Cleveland Sage  

Lavender   

Rosemary  



Thyme  




Westringia  

Ceanothus    





Lupine   

Manzanita    

Deergrass  

Island Snapdragon   



Shaw Agave    



Coyote Bush    





Trees


Pomegranate  




Calif. Buckeye   

Tabebuia  





Crape Myrtle  






Arbutus 'Marina'    

Coast Live Oak   

Palo Verde   

Toyon    

Western Redbud    

-  California Native
-  fire-resistant characteristics
-  good for slopes
-  attracts butterflies/birds/bees
-  good for shade

Since plants are the basis of the food chain and an important source of animal habitat, introducing invasive plants can change entire ecosystems. Visit the California Invasive Plant Council at <http://cal-ipc.org> for more information.

Visit one or two well-designed demonstration gardens showcasing dry land plants. In Southern California, one notable example is the Water Conservation Garden at Cuyamaca College in San Diego County. Various drought tolerant-themed gardens are on display along with interactive compost, irrigation and turf exhibits that demonstrate up-to-date information on conserving water. Also, the South Coast Botanic Garden has a WaterWise garden of attractive plants that require little water. Santa Barbara Botanic Garden maintains a Home Demonstration Garden exhibiting a variety of water-conserving native species that are useful in a wide range of landscape applications. See page 4 for a list of gardens to visit.



California Poppies (*Eschscholzia californica*) make attractive bedding plants and need little water.

Care and Maintenance

Train your plants to use less water: when first establishing low-water use plants, water as needed to keep the root system moist but not saturated for the first year or so until the plants become established. As your plants mature, decrease the the frequency and increase the depth of irrigation. They will benefit from deep, slow, and less frequent watering - water only as needed to keep plants healthy. This practice takes advantage of the drought tolerant characteristics of these plants. It also discourages weeds, overgrowth, and snails. Avoid waterlogging the root system of these plants. Many traditional landscape plants can perform acceptably on less water also, so you can achieve water savings without removing many of your existing plants.

When scheduling irrigation, consider the slope, any strong prevailing winds, heavy shade, or microclimate areas that tend to be cooler or warmer. Select plants that are not only drought tolerant, but can handle the surrounding conditions. Note that if plants are changed but irrigation practices are not, then water savings will not be realized.



Coast Live Oak (*Quercus agrifolia*) is a majestic drought tolerant tree native to Southern California.

Leave enough room around each plant to allow for future growth as the plant matures. Slow growth and low maintenance are common qualities of many drought tolerant plants. Whether a plant grows fast or slow, remember to prune plants selectively each year to reduce excess growth; this can also help to reduce a plant's demand for water.

Maintaining a two-to-three inch layer of coarse organic mulch helps to hold moisture in the soil, thereby minimizing the amount of supplemental irrigation needed. Mulching also helps to suppress weeds that can rob plants of moisture. Be sure to keep mulch away from tree trunks and shrub bases to avoid stem and crown rot. Your local Master Gardener hotline can answer questions regarding the uses and benefits of mulching and composting.

What to do Next

Visit a Garden

- Water Conservation Garden, Cuyamaca College, El Cajon, 619-660-0614
- Chino Basin Water Conservation Dist. Garden, Montclair, 909-626-2711
- El Alisal: Charles F. Lummis Home, Los Angeles, 213-222-0546
- Garden\Garden, Santa Monica, 310-458-8405
- Landscapes Southern California Style, Riverside, 909-789-5087
- Maloof Foundation, Rancho Cucamonga, 909-980-0412
- South Coast Botanic Garden, Palos Verdes Peninsula, 310-544-6815
- Rancho Santa Ana Botanic Garden, Claremont, 909-625-8767
- Santa Barbara Botanical Garden, Santa Barbara, 805-682-4726
- Quail Botanical Gardens, Encinitas, 760-436-3036
- Los Angeles County Arboretum Water Conservation Garden, Arcadia, 626-821-3222

Read some Books

- *Gardening the Mediterranean Way*, Heidi Gildemeister
- *Sunset Western Garden Book*, Kathleen Norris Brenzel, editor
- *Care and Maintenance of Southern California Native Plant Gardens*, Bart O'Brien, Betsey Landis, and Ellen Mackey

Consult an Expert

- Assoc. of Professional Landscape Designers: <http://www.apldca.org/>
- California Native Plant Society: <http://cnps.org>
- U.C. Cooperative Extension Master Gardeners: <http://camastergardeners.ucdavis.edu/>
- U.C. Cooperative Extension Center for Landscape and Urban Horticulture: <http://ucanr.org/cluh>



Perennials and ornamental grasses line a walkway.



Penstemon hybrid in a Pasadena community garden.



Blue Bush Lupine (*Lupinus longifolius*)

References

- U.C. Davis Arboretum website: <http://arboretum.ucdavis.edu/AllStar.htm>
- *Gardening the Mediterranean Way*, Heidi Gildemeister
- *Sunset Western Garden Book*, Kathleen Norris Brenzel, editor
- *Care and Maintenance of Southern California Native Plant Gardens*, Bart O'Brien, Betsey Landis, and Ellen Mackey
- National Atlas for climate statistics: <http://www.nationalatlas.gov>
- California Department of Water Resources: <http://www.water.ca.gov>
- U.S. Environmental Protection Agency: <http://epa.gov>
- García-Navarro, M.C. et al, *Estimation of relative water use among ornamental landscape species*. Scientia Horticulturae 99 (2004) 163-174
- The Landscape Plant Water Needs Table, UCCE Center for Landscape and Urban Horticulture: <http://ucanr.org/landscapewater>
- California Integrated Waste Management Board: <http://www.ciwmb.ca.gov>
- Geisel, Pamela M., *Water Conservation Tips for the Home Lawn and Garden*. UCANR Publication 8036: <http://anrcatalog.ucdavis.edu>
- O'Brien, B.C. 1996. *Xeriscaping: Sources of new native ornamental plants*. 536-539. J.Janick (ed.), Progress in new crops. ASHS Press, Arlington, VA

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