

AS I WRITE this, in early June of 2018, much of the Southwest region of the United States is experiencing serious drought. In my home state of Arizona, over six million residents are affected by D4 or “exceptional” drought conditions. As a garden designer who specializes in desert-adapted gardens, water use has always been a primary concern in my design practice; however, as years of drought accumulate and more people move to the region, the way in which we garden becomes more critical. If conservation of precious water resources is not more aggressively pursued, our experience might end up like that of the population in Cape Town, South Africa. In late 2017 and early 2018, Cape Town became the first major city in a developed country to project “day zero”—the day the 4.3 million residents of the region would run out of municipal water. Severe conservation measures were imposed, limiting residents to 50 liters (13.2 gallons) of water per person per day. When you only have 13.2 gallons per day, you are not going to squander it watering thirsty plants.

When I speak with new clients, particularly those new to the region, I try not to be alarmist about our water situation, but the time of oblivious water use is past. My pitch is that we can create attractive and drought-tolerant landscapes that are appropriate to the region and that will not need eternal life-support. The situation is not hopeless; when viewed through perspicacious eyes, a whole new gardening paradigm presents itself. This paradigm has two main tenets: create gardens that look good and use a lot less water than traditional landscapes. Although I’m working in the driest part of the country, the approaches that work here also can be applied to wetter regions that are now experiencing periodic—or regular—droughts. In the following pages, I’ll share some of my favorite strategies for designing water-thrifty gardens.

#### PLANT THE TOUGHEST OF THE TOUGH

An effective strategy for saving water and giving your garden a strong sense of place is to select key drought-tolerant plant species that are native to your region; they will happily survive and thrive once established with little additional water input. In southern Arizona, suitable plants include ironwood trees (*Olneya tesota*),



Using strategies learned from the Southwest, gardeners anywhere can plan and create a beautiful landscape that requires minimal watering.

# Designing Water-Thrifty Gardens

BY SCOTT CALHOUN

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**Top:** Tough native plants such as blackfoot daisy (*Melampodium leucanthum*), beaked yucca (*Yucca rostrata*), and saguaro cactus (*Carnegiea gigantea*) are part of this Tucson garden designed for low water use and to maximize views of the adjacent Santa Catalina Mountains. **Above:** In Toronto, Canada, Janet Davis has replaced the thirsty turfgrass in her frontyard with brick paving and drought-tolerant herbaceous perennials that add seasonal color and also attract pollinators.

palo blanco (*Acacia willardiana*), foothill palo verde (*Parkinsonia microphylla*), jojoba (*Simmondsia chinensis*), and desert marigold (*Baileya multiradiata*).

Just because a plant is native doesn't necessarily mean it is drought-tolerant, however. There are gradations even among desert plants. In 2010, the Arizona Municipal Water Users Association published a plant guide that rated drought-tolerant plants according to water use—one water drop for the most water-thrifty, and three drops for those needing moderate irrigation. The one-water-drop plants needed watering every three to six weeks during the growing season, with the two-drop plants needing watering every two to four weeks, and the three-drop plants every one to three weeks. If a gardener selected only one-drop plants, the resulting landscape would be very close to needing no irrigation after establishment. While this resource pertains to the desert Southwest, gardeners in other parts of the country can contact their local Extension service for help in selecting the most appropriate water-thrifty plants for their region.

## LOSE YOUR LAWN

Over the last 13 years, I've designed more than 300 residential gardens for clients in Arizona. Of those, only two homeowners have requested a lawn. Conversely, many clients have requested turf removal. My admonition is: If the only time you step on your grass is to mow it, remove it.

The popularity of turf removal is partly the result of rising water bills. One of my clients, when faced with a \$300-a-month water bill, decided that her turf was no longer a financially sustainable part of her yard. Replacing a monoculture of turf with a vibrant fabric of drought-tolerant native plants is the fast road to water savings in residential gardens. Many municipalities in the West, including Las Vegas, have even developed programs that pay homeowners (up to \$1.50 per square foot) to replace their grass with drought-tolerant plants.

Removing a swath of water-sucking lawn also offers a huge design opportunity. The removal of turf creates a blank canvas that allows homeowners and garden designers to reinvent a space in three dimensions—complete with a diverse palette of trees, vines, and wildlife-attracting plants—rather than a flat, green plane.



## ADOPT EFFICIENT IRRIGATION PRACTICES

In home landscapes, a water-wise garden irrigated via drip irrigation can reduce water use by at least 75 percent when compared with turfgrass watered by sprinkler systems. Drip technology pinpoints the delivery of water exactly to a plant's root zone and makes it possible to grow plants without flooding or sprinkling a large area. Because drip emitters only wet a small circumference of soil near the root zones of desirable plants, they also don't encourage weed seeds to germinate elsewhere in the garden.

For more water-needy plants, it's easy to create different zones based on water requirements. Modern drip irrigation systems can be programmed to deliver water more frequently in one zone of the garden than in others, to take into account these variable planting zones. However, as I previously mentioned, it will be a lot easier to sustain your garden long term with tough plants. Needy plants, even those watered with efficient drip irrigation, are still on life-support.

## USE RAINWATER WISELY

The concept of rain gardens is becoming

popular across the country. In regions with high annual rainfall and frequent precipitation events, rain gardens function primarily to slow down and contain runoff from roofs and hardscapes, reducing the flow into storm sewers and water bodies. In drier regions of the country, they also serve to channel water into garden areas that can be maintained without regular irrigation. Rainwater systems can also use tanks, or cisterns, that collect rainwater from the roof during wet spells and store it for use during dry times. Some municipalities provide rebates to homeowners who install rainwater harvesting systems. Tucson, for example, offers up to \$2,000 per property.

## EMBRACE MINIMALISM

In my region, gardens save water not only because they use drought-tolerant plants, but also because fewer plants are used and they are spaced further apart than in a traditional garden design, which reduces the amount of competition for water between plants. The look may take some getting used to, but sparse landscapes have their own beauty that grows on you over time.

Minimalist gardens are characterized by stillness and equilibrium between

planted and unplanted spaces. In minimalist desert garden design, the placement of each plant and rock is important. Minimalist desert gardens often rely on long-lived succulent plants for structure; for this reason, they can be more satisfying and enduring than gardens that employ a higher percentage of shorter-lived herbaceous plants.

Chinese and Japanese gardens have long embraced the idea of negative space between plants and this concept can be used even in regions where water is not as scarce as it is in the desert. When working in a minimalist theme, make sure to carefully consider the top dressing you use—whether it is gravel, river rock, or shredded bark—since more of it will be visible than in intensively planted beds and borders.

## SUCCULENTS RULE!

It almost goes without saying, but because it is often ignored, it bears repeating: You can't design a water-thrifty garden with water-guzzling plants. The good news is that for nearly every thirsty exotic plant, there is usually a waterwise substitute that will serve the same landscape purpose.



The design of this frontyard garden in Scottsdale, Arizona, features widely spaced drought-tolerant plants—mainly cacti—against a canvas of sand and gravel. Larger rocks are arranged to create a dry creek that adds a sense of movement to the landscape.

DENNY KANE





TOP: LYNNE HARRISON. BOTTOM: MARK TURNER

Cacti and succulents are more than mere accent plants in the Southwest; they form the sculptural backbone of arid gardens. Innovative designers and gardeners have created incredible showcases for how to use these plants, including Peck-erwood Garden in Hempstead, Texas, and the Ruth Bancroft Garden in Wal-

nut Creek, California. Public gardens such as the Desert Botanical Garden in Phoenix, Arizona, also provide gardeners with inspiration and practical tips for planning and planting gardens using a diverse palette of succulents.

Plants such as agaves and yuccas come in varieties that thrive in every part of

Many succulents can thrive beyond desert regions. Above: At Ruth Bancroft Garden in northern California, a clump of *Cylindropuntia rosea* thrives near the base of *Yucca treculeana*, which begins flowering in early spring. Left: Agaves punctuate this bed in the Teacup Garden at Chanticleer in Wayne, Pennsylvania.

North America. Lest you think that this mania for spiny plants is limited to the Southwest, take a look at the variety of agaves that nursery owner Tony Avent is growing at Plant Delights Nursery in North Carolina. Or visit Chanticleer garden in Pennsylvania to admire the agaves and wonderful and strange beaked yuccas in its display gardens.

It is clear that these plants are immensely appealing to gardeners—no matter where they live—for their strong forms. In addition to their alluring forms, agaves and many other similarly rosette-shaped plants are morphologically designed to harvest rainfall and direct it to their roots. In this way, each plant is like a small water-harvesting sculpture.



## CONSIDER A RAIN GARDEN

Like the first syncopated raindrops falling on a tin roof, a new kind of gardening is drumming up interest across the United States. This movement—sometimes referred to as “rain gardening”—aims to create gardens that will absorb runoff from roofs and hardscaping and thrive on rainwater alone. The idea is based on the philosophy that gardens should live within a sustainable water budget. This is generally defined as the amount of rain that falls on your lot over the course of a year.

### MUNICIPAL APPLICATIONS

Driven by the need to find alternatives to traditional (and expensive) stormwater management systems, municipalities have provided much of the initial momentum in promoting the idea of rain gardens. For this reason, many of these water-efficient gardens appeared first in commercial projects. In Portland, Oregon, the New Seasons Seven Corners Market is designed to direct rainwater runoff from the roof and paved



The roof garden at the New Seasons Seven Corners Market at Arbor Lodge in Portland, Oregon, collects rainwater and directs it to a number of garden beds in the parking lot.

areas toward concave garden beds planted with horsetail reed and other plants that withstand both drought and deluge.

Closer to my home base, in Tucson, our city council has recently approved a measure that will require all new commercial landscapes to supply half of their outdoor watering needs through rainwater collection. This progressive movement means that, regardless of where you live, rain gardening is probably coming to the planting beds around the parking lot of a new gas station or grocery store in your neighborhood.

### HOME RAIN GARDENS

In a home landscape, rain gardening can begin with a shovel. By digging depressions in your garden to retain rainwater that runs off of hard surfaces such as roofs and driveways, you can create concave areas and fill them with free-draining soil mixes.

The trick to designing these bowl-shaped spaces is to include a range of plants suited to the different moisture zones. Some plants will only tolerate the slightly drier marginal edges of a rain garden, while others that like wet feet will thrive despite occasional submersion at the bottom of the basin. As a starting point, consider the sampling of American natives, linked to this article on the AHS website, that are appropriate for rain gardens in many areas of the country. Supplement or replace these with plants native to your region; in many municipalities, water companies, departments of environmental resources, or similar agencies offer guidelines and plant lists for creating rain gardens.

—S.C.

## BORROW THE VIEW

If your garden setting is graced with dramatic mountain, sky, forest, or ocean views, the Japanese design principle of *Shakei*, or “borrowed landscape,” can often be well employed as part of a drought-tolerant design.

Framing and fronting a picturesque view of mountains or wild plantings is an inexpensive way to add plants and extra dimension to your garden. Panayoti Kelaidis, senior curator and director of outreach for Denver Botanic Gardens in Colorado, says that this practice, which he terms “vista and vignette,” is a hallmark of western gardens. In other parts of the country, the view you borrow might be more about enclosure than horizons, but whether you frame a distant grove of oak trees or a neighbor’s vibrant hedge of shrub roses, it is still a way to incorporate plants that you don’t have to water (or prune) into your garden.

## TARGET YOUR SHADE

In my region, cities like Las Vegas and Phoenix have become “heat islands” in which increased paving and development cause the mean temperature to rise by as much as 10 degrees compared with surrounding areas. The urban heat island ef-



The shade cast by trees, such as this palo verde in a Tucson garden, helps mitigate heat in urban areas, which reduces the need for water-generated electricity for air-conditioning.





fect can be found in all North American cities, which means, more than ever, that we need trees to cast shade and serve as passive solar coolers to help reduce temperatures in our homes and gardens.

Trees can greatly ameliorate the effect of urban heat islands. In our home gardens, we can actually grow our own “air conditioning” by planting trees around our homes. Even though shade trees usually require more water to establish than smaller plants, the expenditure is worth it. Then, you might ask, “How does planting trees save water?” Because most power plants use large quantities of water to produce electricity, by reducing your need for air conditioning, you are saving both water and energy.

### CREATE STUNNING BEAUTY

When the concept of drought-tolerant gardens started coming into vogue some three decades ago, the term “xeriscape” was coined to describe the idea. Because some of these early gardens were rather drab and unimaginative, critics called them “zeroscapes” and the concept received much negative publicity.

The diversity of plants suitable for water-thrifty gardens has evolved tremendously in the intervening years, but



aesthetics might still be the most neglected aspect of drought-tolerant garden design. Certainly our native plants and some well-adapted exotics from Mediterranean regions are every bit as beautiful as many of the thirsty non-natives that have become standard in our landscapes, but we need to arrange them in a way that shows off their best characteristics.

Drought-tolerant doesn't mean drab. Above: In David Salman's New Mexico garden, silvery *Artemisia frigida* mixes it up with orange-flowered pineleaf penstemon (*Penstemon pinnifolius*), blackfoot daisy (*Melampodium leucanthum*), and various cacti. Left: The white trunks of palo blanco trees (*Acacia willardiana*) contrast with vibrant orange masonry planters in the author's studio garden, which includes 'Quadricolor' agave (*Agave lophantha*), Parry penstemon (*Penstemon parryi*), and beaked yucca (*Yucca rostrata*).

To put it another way, if we are going to encourage other gardeners to tear out or reduce their lawns and standard border plantings, the replacement garden had better be dynamic, colorful, graceful, and well balanced. Just because a garden is drought-tolerant doesn't mean that it is exempt from commonsense design principles.

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