EASY WATERWISE GARDENING

Create a beautiful garden and save water too.

FROM THE EDITORS OF

Sunset

Great gardens for a new era

In the West, water is as precious as gold. Most of our rainfall comes in winter, yet many garden plants need irrigation in summer, during our driest months. Seasonal droughts, groundwater pollution, and population growth stress this valuable resource. If we are to have enough water in the future, we must avoid wasting water in our homes and gardens today.

Of the water Westerners use at home, about 50 percent goes to gardens. So the most important place to start a conservation program is right outside our doors. Fortunately, water conservation doesn't mean settling for a barren landscape; it means practicing good gardening. By choosing plants well adapted to our climate, replacing thirsty lawns, improving our garden soil, watering carefully, and taking advantage of the latest irrigation technology, we can all help save water—and look forward to a future of lively and colorful yet water-wise landscapes. *—The editors of Sunset*

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AT LEFT: In a vibrant garden at *Sunset's* headquarters in Menlo Park, CA, golden cotinus, grevillea, and succulents thrive with little water. **Design:** Steve Hinderberger *(hindesignonline.com)* and Dig Gardens *(diggardens.com)*. **ON THE COVER:** Tall kangaroo paws, spiky phormiums, and billowy burgundy cotinus mix with ornamental grasses in a low-water landscape in Tiburon, CA. **Design:** Arterra Landscape Architects *(arterrallp.com)*. *Photo by Thomas J. Story.*

THOMAS J. STORY

Meet the elements of a low-water landscape

A dry garden can be as inviting as any other.

Drought is a fact of life in the West. It's part of the natural weather cycle. That's why water conservation should be a part of every Westerner's lifestyle. Happily, a well-designed waterwise landscape can be lush and colorful and will make your home a beautiful and inviting place.

Start by leaving more areas unplanted than you would if you lived in a wetter climate—a big water savings right off the top. Make the paths generous and put gravel under seating areas instead of planting a groundcover. Use decomposed granite in place of thirsty lawn grass. Then plant the remaining spaces with ornamentals that are adapted to arid climates. Finally, to highlight water's revered status in the unthirsty garden, add a few traces of it, some real, some illusory: a fountain that barely trickles, a dry streambed that awaits the next downpour, or a lovely urn.

NO LAWN Landscaping with a tapestry of low perennials and groundcovers instead of thirsty turf saves precious water. **Design:** Rebecca Sweet, Los Altos, CA; *harmony inthegarden.com*.

PERMEABLE PAVING Strips of flagstone interplanted with woolly thyme and silvery *Dymondia margaretae* allow rainfall to percolate directly into garden soil.

MULCH A thick layer of mulch helps preserve soil moisture. But it can also enhance design, creating negative space that makes plant groupings or individual specimens stand out.

UNTHIRSTY PLANTS Mediterranean climate plants such as lavender and lamb's ears and succulents such as *Aeonium* and *Senecio mandraliscae* are well adapted to the West: They require little water and maintenance, and their blue-green, gray-green foliage looks right in our light.

DRIP IRRIGATION Low-flow irrigation is the most efficient way to water plants—there's no runoff or evaporation. It's also the healthiest system for plants because the water penetrates deeply into the soil, encouraging plant roots to do the same.

RACHEL WEILL

8 WATER-SAVING BASICS

Follow these guidelines for a water-efficient garden.

1. IMPROVE THE SOIL Routinely cultivate the soil in your vegetable and annual beds, incorporating organic matter such as compost. Doing so improves the soil's ability to retain moisture. Most landscape plants (trees, shrubs, and native plants especially) establish faster when planted in native soils without the addition of amendments. If your soil is sandy or rocky, you may need to add compost.

2. PLANT IN THE RIGHT PLACE Locate unthirsty plants where they'll get the sun (or shade) exposure and soil drainage they need. Group plants that have similar water needs so none gets too little or too much water.

3. SHRINK THE LAWN Most lawn grasses need enormous amounts of water to stay green and lush. Reduce your lawn's size, or—unless you need it for kids to play on—eliminate it altogether.

4. CONTROL WEEDS These garden intruders steal water needed by desirable plants. Regularly hoe or pull them out when they're young, or use landscape fabrics and mulches to discourage growth.

5. UPGRADE YOUR IRRIGATION SYSTEM Add elements such as smart controllers connected to weather stations and new, highly efficient sprinklers or drip emitters to make precision watering much easier. (See pages 18–23.)

6. WATER DEEPLY Irrigate established plants thoroughly but infrequently to encourage roots to grow downward; they will be buffered from the wet-dry cycle typical of the upper soil area and may tap into groundwater.

7. IRRIGATE EFFICIENTLY Make sure your watering practices and devices are as efficient as possible. Water plants only when needed, not by the calendar or clock. Water at night, when evaporation is much lower and the air generally calmer. Tighten faucets so they don't leak. Avoid runoff and wasteful overspray.

8. MULCH Cover bare ground around each plant with a 3-inch layer of mulch to help conserve soil moisture, suppress weeds, and keep the soil cooler; renew annually. Organic types such as bark chips, shredded bark, or compost improve the soil as they break down, and encourage beneficial microbes. (See pages 24–25.)

Plant smart for where you live

While local natives are best suited to most sites, other good choices include drought-tolerant plants from all corners of the world. Some of the most waterwise options are native to the Southwest deserts. Others are from the five Mediterranean climate regions—California, the Mediterranean basin, South Africa, southwestern Australia, and the central coast of Chile—where rains are spare and summers are warm and dry.

Many of these plants share characteristics that help them survive periods of intense heat and low rainfall. They may have gray or velvety leaves that reflect heat; succulent leaves, stems, and roots that store water; or needle-like leaves whose small surface area limits the potential for water loss. Or they may go dormant during the hottest months of the year.

Waterwise plants have different degrees of drought tolerance. Plants that thrive on 30 inches of rain in the Northwest, for instance, will wither in a Southwest garden where the average rainfall is 10 inches or less. Do your homework before finalizing plant choices, then cluster plants by their water needs. Place thirstier (and often showier) plants near the house or in other high-visibility spots, less thirsty plants in the background. Make sure your irrigation plan supports each zone independently of the others.

Avoid the mistake of thinking that some types of plants never need watering. All plants, native or not, need regular, deep irrigations through the first year to help their roots become established. Some need moisture into the second year, but by then, many do fine with only an occasional deep watering. A bit of research and consulting with your local nursery or cooperative extension service will help you figure out how much water your plants need.

KNOW YOUR ZONE
No matter where you live in the West, the *Sunset* climate zones tell you what plants will thrive in your garden year-round; they're an invaluable tool for planning your drought-tolerant garden. Learn more in *The New Sunset Western Garden Book* or at *sunset.com/zonefinder.* (See also page 28.)

SUNSET'S UNTHIRSTY 30

Editors' picks for the top low-water, high-performance perennials & shrubs for Western gardens. In mild climates, all thrive with little irrigation once established.

African daisy *(Arctotis)*. These tough, perennial beauties bloom over a long season in a range of vibrant colors. Their leaves are rough and woolly; the flower heads usually have a striking ring of color around the central eye.

Heavenly bamboo *(Nandina domestica)*. Evergreen shrub with fine foliage that takes on bronze tints in fall. Clusters at tips bloom in summer. Many varieties are available (*N.* 'Obsession' is shown).

Sea lavender *(Limonium perezii)*. Perennial native to the Canary Islands, it grows in lush clumps of leathery foliage and puts up broad clusters of purple flowers in spring and summer.

KIMBERLEY NAVABPOUR (3), LINDA LAMB PETERS (4), THOMAS J. STORY (3), E. SPENCER TOY (1)

Kangaroo paw *(Anigozanthos)*. An evergreen perennial from Australia. Strappy foliage and tall stems topped with velvety blooms in many colors give kangaroo paws a striking appearance. Hummingbirds love its flowers.

Santa Barbara daisy *(Erigeron karvinskianus)*. Free-blooming perennial with daisylike flowers. Dainty flower heads with numerous white or pinkish rays. Rarely out of bloom.

Echium. Biennials, perennials, and shrubs grown for their dramatic towering flower clusters. All do well in dry, poor soil but need good drainage. Flowers attract bees. 'Pride of Madeira' *(E. candicans)* is shown.

Gaura lindheimeri. Graceful perennial with airy, upright growth. Spikes bear small white flowers over a long bloom period (often from late spring into fall). Deep taproot makes it drought-tolerant.

Yarrow *(Achillea)*. Carefree perennials with flat-topped flower clusters summer through fall. Aromatic leaves are gray or green; some with toothed edges. Many varieties.

Autumn sage *(Salvia greggii)*. Evergreen or deciduous shrub with aromatic leaves and small flowers that hummingbirds can't resist. Blooms throughout summer and fall, in colors ranging from purplish red to pink to white.

Lamb's ears *(Stachys byzantina)*. A very rugged groundcover, this woolly-leafed perennial grows in thick, gray-green rosettes and has tall blossom stalks with tiny purplish flowers that attract bees.

Tea tree *(Leptospermum)*. Soft, casual evergreen shrubs or trees native to New Zealand and Australia. Tiny, velvety flowers are typically white, pink, or red. Petals surround a central cup that matures to a woody seed capsule. *L. scoparium* is shown.

Get details about these and other plants at *sunset.com/plantfinder.*

California wild lilac *(Ceanothus)*. Shrubs and groundcovers with deep green leaves and flowers that range from white through all shades of blue. Most flower in spring. Generally evergreen. C. 'Concha' is pictured.

Bougainvillea. With masses of papery, petal-like bracts in a range of vibrant colors, bougainvilleas are showstoppers yet very tough once established in the West's warmer climates. Plants come in vining and shrub types.

Coreopsis. Easy-to-grow annuals and perennials that yield a profusion of yellow, orange, maroon, or reddish flowers. They attract butterflies and the seed heads attract birds. *C. verticillata,* one of the most tolerant of drought and neglect, is shown.

Get details about these and other plants at *sunset.com/plantfinder*.

Rockrose *(Cistus)*. Carefree evergreen shrubs covered with flowers for a month or more from spring into early summer. Soft green or grayish foliage and mounded form provide subtle color and texture. *C. x purpureus* pictured.

Phlomis. Handsome perennials and evergreen shrubs grown for their upright stems set with whorls of flowers in yellow, purple, or lilac. Gray-green furry leaves are thick and moisture conserving. *P. fruticosa* is pictured.

Phormium. Dramatic perennials with swordlike evergreen leaves that grow in a fan pattern. Many variegated selections provide year-round color (*P.* 'Jubilee' shown). On established plants, spikes of tubular flowers appear in early summer.

Nepeta. Vigorous, spreading perennials with aromatic foliage. All except catnip (*N. cataria)* provide graceful spikes of blue or blue-violet (or sometimes pink, white, or yellow). *N.* x *faassenii* is shown.

Artemisia. Perennials and shrubs valued for aromatic, silvery foliage. In mixed borders, their soft hues temper reds and oranges and blend beautifully with lavenders and pinks. *A.* 'Powis Castle' is shown.

ROB D. BRODMAN (1); LAURA DUNCAN-HUBBY (1); KIMBERLEY NAVABPOUR (3); LINDA LAMB PETERS (7); THOMAS J. STORY (5); **MANZANITA**: ANNIE'S ANNUALS (1); **PHORMIUM**: PLANTHAVEN, INC. (1)

Lavender *(Lavandula)*. Undemanding evergreen shrubs that range from ankle to waist high. Its flowers can be lavender, purple, pink, or white and many varieties are intensely fragrant. Foliage is usually a soft gray-green and is also aromatic.

Red-hot poker *(Kniphofia)*. Flowering stems that look like glowing pokers rising above clumps of grasslike foliage give this perennial its common name. Blooms range from coral red through orange and yellow to near-white.

Manzanita *(Arctostaphylos)*. Broad-leafed evergreens, many native to California, vary from creeping groundcovers to treelike shrubs; all have small pale flowers followed by red or brown fruits that appeal to birds.

Mexican bush sage *(Salvia leucantha)*. This easy-care garden workhorse is a vigorous shrub with velvety, grayish green leaves and tall stems that bear whorls of white flowers with purple calyxes.

Beard tongue *(Penstemon)*. More than 250 species exist, almost all native to the West. Bell-shaped flowers in a range of colors from soft pink to hottest red are usually borne on long upright stems. A hummingbird magnet.

Lion's tail *(Leonotis leonurus)*. Evergreen shrub from South Africa, it can grow to 6 feet with tall stems of tubular orange flowers summer through fall.

Lavender cotton *(Santolina chamaecyparissus)*. Tough evergreen shrub notable for its attractive, aromatic foliage and profuse summer show of small, round flowers. *S. c.* 'Pretty Carol' is shown.

Grevillea. Evergreen shrubs and trees vary in size and appearance, but generally have fine-textured foliage and long, slender, curved flowers, usually borne in dense clusters. *G.* 'Superb' is shown.

Rosemary *(Rosmarinus officinalis)*. The quintessential Mediterranean accent, this aromatic shrub can be stiff and erect, rounded, or prostrate and creeping. Tiny blue flowers appear through winter and spring.

Agastache. Dependable, summer-blooming perennials with fragrant foliage. Upright stems packed with flower whorls make colorful additions to herb gardens and flower borders. Many hybrids; *A.* 'Orange Nectar' is pictured.

Russian sage *(Perovskia atriplicifolia)*. This shrubby perennial is not actually a sage, but it is just as tough, with upright grayish white stems clothed in aromatic gray-green leaves. In late spring and summer, stems are topped with sprays of small lavender-blue flowers.

Use permeable paving

Porous surfaces allow rainfall to percolate down to plant roots.

Paths and patios that are paved with gravel, decomposed granite, spaced flagstones, or porous concrete are the best choices for water-conserving gardens. Permeable paving materials add structure to the garden and, of course, require no irrigation themselves. Plus, they allow rainwater and irrigation to pass into the soil, preventing runoff that can pollute local waterways. You can green up spaces between pavers by planting mat-forming groundcovers, such as woolly thyme and *Dymondia margaretae*.

If you're considering gravel, visit a landscape supply yard to experience the look and feel of different types. Gravel refers to rocks ranging in size from 1/8 inch to 1 1/2 inches. It comes in two forms: Manmade crushed rock has sharp, irregular edges; nature-made river rock (also known as natural pebbles) is rounded. Consider where it will be used. For high-traffic areas, such as paths, use manmade crushed rock: Because pieces bind together well, they create a more stable surface for walking. For a softer surface under bare feet, use 1/4-inch or finer natural pebbles. River rocks (less stable underfoot) are attractive in low-traffic areas.

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IN NUMBERED ORDER: STEVEN A. GUNTHER, THOMAS J. STORY, JENNIFER CHEUNG/JUPITER IMAGES, THOMAS J. STORY, LINDA LAMB PETERS, JIM MCCAUSLAND, STEVEN A. GUNTHER

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7 WAYS TO GO POROUS

1. GOLDEN GRAVEL In this Los Angeles garden, a base of warm-toned 3/4-inch gravel makes a bold visual distinction from surrounding greenery, including drought-tolerant blue *Senecio mandraliscae*.

2. SHALE AND PAVERS Fractured shale fills gaps between concrete pavers in a garden in Alamo, CA; yarrow and grasses soften the path's edges.

3. FIRE AND ICE *Dymondia margaretae,* which can take light foot traffic, makes a silvery mat between rusty red flagstone pavers.

4. FIT FOR A FIRESIDE 'Paprika' yarrow and 'Walker's Low' catmint edge a secluded gravel seating area in California's wine country.

5. POCKET PATIO An 8-foot circle of slate set into a base of compacted sand is easy to move and adapt for different purposes. It's backed by a low-water border that includes phormiums and Mexican bush sage.

6. WOODSY PATH Spaced concrete "stones" curve through a garden in Gig Harbor, WA.

7. PAIRED MATERIALS Edged with pale flagstone, a half-inch of decomposed granite over a compacted base forms a well-draining surface in this garden in Rancho Mirage, CA. Palo verde, agaves, opuntia cactus, and barrel cactus thrive in the flanking gravel patches.

Rethink your lawn

Gone are the days of an unused thirsty turf lawn. Save on water and maintenance by replacing it with an inviting alternative.

FRAME AN EARTH-FRIENDLY PATHWAY
Ditching her thirsty lawn was an easy choice for Sacramento landscape designer Roberta Walker, an advocate of drought-tolerant gardening. After removing her grass, she laid down weed cloth and permeable pea gravel, which allows rainwater to soak into the earth rather than run off into the street, and a curving flagstone path to the front door. To give the ground more interesting topography, she built low berms on either side of the main walkway and planted them with drought-tolerant evergreens including dwarf agave, *Artemisia* 'Powis Castle', coreopsis, lavender, rosemary, santolina, and yucca. Plants grow in well-spaced clusters, allowing their natural forms to shine. The result? "The water I use now is probably less than a third of what I once used for the lawn," Walker says. "I go out there three times a year to prune and shape plants." **Design:** Roberta Walker Landscape Design, Sacramento; *robertawalker.com*.

GO HERBAL
An herb "lawn"—'Pink Chintz' thyme—brightens this low-water New Mexico yard. In the 625-square-foot space, the homeowners planted 256 thymes from 2-inch containers, setting them 12 inches apart. Bordering the lawn are drought-tolerant perennials including catmint, 'Moonshine' yarrow, Russian sage, and santolina, all of which survive on overspray from the thyme turf's sprinklers.

CLOCKWISE FROM TOP LEFT: ROBERTA WALKER, THOMAS J. STORY, ART GRAY, CHARLES MANN

WELCOME WITH WAVES
Plants growing in bold ribbons provide more privacy than any lawn could in this front yard, yet the look is very friendly. Low-growing blue *Senecio mandraliscae* move up to swaying *Stipa tenuissima*. In back are tall perennials ('Big Red' kangaroo paws and Jerusalem sage) and small trees ('Bloodgood' Japanese maple and *Acacia pendula*). Throughout the year, the display offers color and movement. **Design:** Greg Sanchez, GDS Designs, Los Angeles; *gdsdesigns.com*.

The new landscape uses much less water than the lawn—and it's a lot more fun to be in the garden.

PLANT A LOW-WATER BUTTERFLY BAR
When Claudia Armann and her husband, Kurt, moved into their house in Ventura, California, the first-time homeowners faced a boring patch of lawn and little else. Two years later, they were enjoying a vibrant landscape composed of succulents and drought-tolerant perennials, including rosemary, pink lantana, Jupiter's beard, and Mexican bush sage. Sedum and other small succulents trim the edges. Plus, the new landscape uses much less water than the old lawn; most plants need irrigation only once a month. And it's a lot more fun to be in the garden. "There are always bees, butterflies, and birds," Armann says.

ADD POPS OF COLOR
While many gardens go dormant in the heat of late summer, this one in Venice, California, explodes with the red-orange blooms of California fuchsia 'Catalina'. The flower, which grows naturally in rocky areas or on dry slopes and thrives with very little irrigation, looks at home against the gabion walls and surrounded by gravel. **Design:** Jeff Pervorse, Bent Grass Landscape Architecture, Venice, CA; *bent-grass.com*.

GROW A MEADOW
Grasses that don't have to be mown are a lot more entertaining than turf. They shiver in breezes, capture the light, and make an urban landscape feel like the country. Most require less water too, as with the Mexican feather grass seen here. Caveat: This grass *(Nassella tenuissima)* can be invasive in some areas; if you live near wildland, substitute Atlas fescue *(Festuca mairei),* autumn moor grass *(Sesleria autumnalis),* blue grama *(Bouteloua gracilis),* or pink muhly *(Muhlenbergia capillaris).* **Design:** Grace Design Associates, Santa Barbara; *gracedesignassociates.com*.

CLOCKWISE FROM TOP LEFT: STEVEN A. GUNTHER, ANDREA M. GÓMEZ, STEVEN A. GUNTHER

PLANT ISLANDS OF PERENNIALS
A calm desert was the inspiration for this garden in Santa Monica, where bold plants and wide paths of decomposed granite replaced what was a swath of thirsty lawn. Kangaroo paws and strappy phoriums add striking vertical elements, while a center island of woolly thyme and 'Dragon's Blood' sedum encourages visitors to stroll around the garden, admiring the succulent collection. **Design:** Ania Lejman, ALD Landscape Planning + Design, Venice, CA; *aldco.com*.

FROM LEFT: STEVEN A. GUNTHER, MARION BRENNER, STEVEN A. GUNTHER

RIGHT-SIZE IT
In this smart urban retreat, a patch of super-soft creeping red fescue is just big enough for lounging. It needs less water and maintenance than standard lawns, stops growing at 9 to 12 inches tall, and requires mowing just once a year. **Design:** Outer Space Landscape Architecture, San Francisco; *outerspacela.com*.

MAKE IT A PATIO
By converting part of their driveway and lawn into a front-yard patio, these homeowners gained a neighborly perch—a seating wall midway between their front door and the street. A low buff-colored wall frames a seating area closer to the front entry. A Chinese elm adds shade, while fescue and drought-tolerant thyme fill in the cracks between recycled concrete pavers. **Design:** Rob Steiner Gardens, Los Angeles; *robsteinergardens.com*.

GROW A BETTER GRASS

Want a spot of lawn but not the big water bill? In years of normal rainfall, these grasses can live without extra irrigation in their native Western ranges, and they need mowing just once or twice a year.

DESERT Fine fescue, spring-planted buffalo grass, or blue grama.

NORTHERN CALIFORNIA and the **NORTHWEST** Fine fescue and hair grass (*Deschampsia*).

ROCKY MOUNTAIN Buffalo grass or blue grama below 6,500 feet; fine fescue above.

SOUTHERN CALIFORNIA Fine fescue or spring-planted 'UC Verde' buffalo grass (along coast).

Focus your efforts

Make every drop count by understanding your plants and soil.

When determining how you should water, first consider your plants. Because plants with deeper roots are better able to withstand periods of drought, your goal should be to apply enough water to wet the entire root zone and to encourage deep rooting. Shallow watering leads to shallow roots and plants that are very susceptible to drought and fluctuating temperatures. You should also avoid applying so much water that it penetrates deeper than roots actually grow. That water is wasted.

SMART WATERING 101

Plan hydrozones. Organize your landscape into "hydrozones"—groups of plants with similar water, soil, and exposure needs. By doing so, you can apply water very efficiently and allocate more water to thirsty plants and less to unthirsty ones. For example, you should separate low-water users, which thrive on rainfall alone or with minimal supplemental water (such as native plants, or ones similarly adapted to drought) from high-water users (such as lawns, annual flowers, and vegetables). As much as possible, maximize the amount of garden space dedicated to low-water users.

Observe your plants. Get to know the signs of moisture stress, such as droopy, off-colored foliage.

Know your soil. Check it frequently, making sure it is not too wet or too dry between waterings. If necessary, add organic matter to improve soil texture or to hold moisture better.

Water deeply, then let the soil partially dry before watering again. Water at night or early in the morning, when the air is calm and temperatures are cool. Irrigate long enough to wet the entire root zone. (A plant's roots generally spread as wide as its foliage.) To determine how deep the water is penetrating, push a stiff metal rod into the soil after watering. It will move easily through wet soil but will stop or be harder to push when it hits dry soil. Before watering again, let the top few inches of soil dry out, depending on the size of the plant.

Avoid runoff. Don't apply water faster than the soil can absorb it. Direct water to plant roots by creating furrows of soil 3 to 6 inches deep around plants. To avoid runoff on slopes, build terraces or basins on the downhill sides of plants.

Pulse-irrigate plants in clay soil or on slopes: Apply water until puddles appear, stop until the water is absorbed, then repeat the cycle until water penetrates to the desired depth. Use drip or low-volume irrigation (see page 20).

Adjust watering schedules with the weather and seasons. Water less often in cool weather, more frequently during hot weather. (See "How season affects watering," page 23.)

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CLOCKWISE FROM LEFT: ROB D. BRODMAN, DARROW M. WATT, E. SPENCER TOY, ROB D. BRODMAN, CRAIG D. WOOD

MANUAL WATERING DEVICES

Hand watering can be very efficient: You can pinpoint individual plants and vary watering times based on plant needs and weather. The right devices make it easier.

1. SOAKER HOSES Flat hoses perforated on one side or porous "ooze" types work best on level ground. Run them along rows of vegetables, flowers, or hedges; spiral around trees.

2. HOSE-END NOZZLES Nozzles turn water flow into a variety of sprays. Those with long handles are helpful for watering hanging baskets or reaching the center of a raised bed. (If the nozzle doesn't have a shutoff valve, you can connect one between it and the hose.)

3. PORTABLE SPRINKLERS They feature different spray methods: oscillating, rotating, or traveling. Choose a heavy-weight model with adaptable spray patterns so you can isolate the area to be watered.

4. BUBBLERS They attach to hose ends to gently irrigate shallow furrows of vegetables or flower seedlings.

Slow soaking encourages deep root systems that are better able to withstand drought.

Install the right system

For reliable watering of large areas, use sprinklers—or for best efficiency, a drip system

The key to using sprinklers efficiently is to focus coverage precisely and eliminate runoff; typically you must adjust some nozzles to different arcs than others.

TRADITIONAL SPRINKLERS

For large lawns and some planting beds, underground rigid-pipe sprinkler systems are the standard watering method in many gardens. To operate properly, they need high pressure (40 psi or more at the water source). Stores or nurseries that specialize in irrigation supplies can help you plan a system, or you may prefer to have a professional design it. Regardless, it makes sense to be involved with the planning. Here are some basic guidelines.

Limit heads. Use as few sprinklers as possible to achieve head-to-head coverage: Spray from one sprinkler should reach the head of the next sprinkler. For full coverage, each area should be covered by three sprinklers.

Isolate sprays. Position sprinklers to prevent overspray into neighboring hydrozones or paved areas.

Simplify the course. Plot layout of underground pipes with the fewest turns possible.

Group by valve. Plot circuits—a group of sprinklers controlled by the same valve—to correspond to your landscape's hydrozones (see page 18). Everything on one circuit (valve) will be watered at the same time. Your water pressure and flow rate will determine how many sprinklers you can have on each circuit.

Maintain your sprinklers. To make sure your system operates efficiently, watch it run to check for leaks, malfunctions, or poor performance; look for unusual wet spots on the pavement or dry areas in the lawn. Adjust sprinklers when necessary, and unclog heads with a knife or piece of wire. Replace broken sprinklers or risers. Water-filled valve boxes or leaking sprinklers may be a sign that valves need to be repaired or replaced. A constantly running water meter is a sign of problems.

DRIP IRRIGATION

While sprinkler systems use high pressure to disperse water over a large area, drip or low-volume irrigation delivers water at low pressure to specific areas, often just to individual plants. Penetration of water is slow, its depth regulated by the length of time the system is on. The result is well-watered plants, using less water than with sprinklers. Drip emitters, which release water directly to the soil, waste virtually no water; even minisprayers and minisprinklers, which spray water into the air, deliver less water than ordinary sprinklers do. Emitters and minisprinklers are available in many styles, varying primarily in output (gph—gallons per hour) or, in the case of minisprinklers, in the size and shape of watering pattern. The right emitter depends on your plants and soil type: the heavier the soil, the slower it absorbs water. For heavier soils, you should irrigate with lower gph emitters, then run the system longer to supply enough water.

If you wish to install a drip system yourself, consult the information provided by irrigation system suppliers. You'll need to create a scale drawing of your yard to calculate equipment needs. Small systems, suitable for containers or small raised beds, are available as complete prepacked kits.

Smaller drip-irrigation tubes branch off the main line to focus water just where it's needed. Since emitters apply water directly to the soil surface, plants' leaves stay dry—that's a big benefit to mildew-prone edibles like tomatoes and squash.

Convert sprinklers to drip. If some circuits of your conventional sprinkler system are watering plants that could be more efficiently irrigated with drip, you may be able to retrofit your system by making use of the existing underground pipes. The various conversion systems call for removing all the conventional sprinklers on a circuit, connecting drip components at one or more risers, and capping all risers that aren't used. In most cases, you must add a filter and pressure regulator to the line.

Maintain your drip system. Once installed, check periodically to make sure wetting pattern is as expected, and for loose or broken tubing and evidence of leaks (such as puddles or eroded soil). Clean clogged emitters and the filter, as needed. Move emitters farther from plant bases as plants grow, and add emitters as your garden matures.

FROM LEFT: GEORGE OLSON, REED DAVIS (2), E. SPENCER TOY

COZY UP TO YOUR CONTROLLER

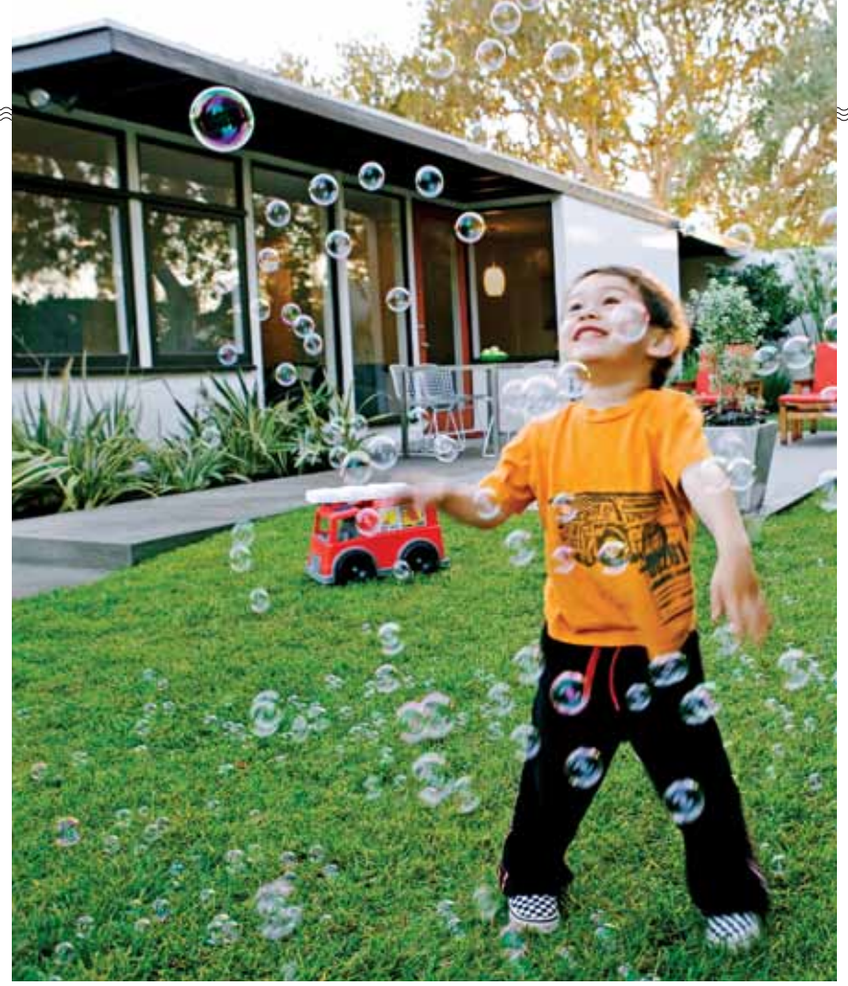
When connected to a well-designed irrigation system, an automatic controller can reduce waste and do a better job of watering than most gardeners can—provided the controller is properly set and gets adjusted with the seasons.

Multiple-program controllers provide the most efficient way to irrigate different areas of the garden with differing water needs. Programs allow you to set when the system comes on (say, Tuesdays and Fridays at 6 a.m.) and how long it runs (run time). Multiple start times allow the water to be delivered in shorter spurts to prevent runoff.

But it's important to reprogram the controller to suit plants' changing water needs. Adjust your irrigation schedule at least monthly to reflect changes in weather and day length. For example, a lawn that requires watering 4 days per week in July will generally need watering only 3 days per week in September and 1 or 2 days per week in October. The smartest new controllers use Wi-Fi connections or in-ground sensors to limit watering in rainy weather and increase it in heat waves. Because they save so much water, many water districts refund their $90 to $300 cost.

Manage thirsty plants

Lawns, vegetables, roses, and annuals usually need a lot of water. Here are ways to scale back.



If you need a lawn, keep it small and well managed to minimize water use.

LAWNS

Still firmly rooted in many backyards in the West, lawns are responsible for as much as half of outdoor residential water use, and studies show that most are significantly overwatered.

Mow higher. Set your mower at 2 to 2½ inches for bluegrass, 2 to 3 inches for tall fescue, and 1 inch for warm-season grasses such as Bermuda and zoysia.

Cut back on fertilizer. Too much nitrogen encourages water-thirsty new growth.

Know your sprinkler system. To find out how much water your sprinklers apply, place five straight-sided cups (more cups will give a better reading) randomly on your lawn. Run the sprinklers for 15 minutes, then measure the water in each cup. For example, if ¼ inch of water collects in 15 minutes, your sprinklers deliver 1 inch an hour. If necessary, make adjustments based on your grass's requirements. Also watch sprinklers run and fix leaks (see page 20).

Water for short intervals. This way, the soil can absorb the moisture without wasteful runoff.

Switch to low-volume sprinklers. These apply water at a rate slow enough for the soil to absorb. Reduce irrigation in shady areas.

Stretch the time between irrigations. During drought or water shortages, let the lawn go dry. Many lawn grasses, including Bermuda, tall fescue, and zoysia, will green up when they can be watered again. Otherwise, you can always replant. Replace difficult-to-water narrow strips of lawn or grass growing on slopes with less thirsty groundcovers. Choices include *Coprosma* x *kirkii,* dwarf coyote brush *(Baccharis pilularis),* star jasmine *(Trachelo spermum jasminoides),* and trailing African daisy *(Osteospermum fruticosum).*

Switch to drought-tolerant grass, such as tall fescue or hybrid Bermuda. Or better yet, plant a locally native, low-water grass (see options on page 17).

VEGETABLES

Whenever possible, start plants from seed. These plants usually develop stronger and deeper roots. Buy small transplants. Avoid seedlings that are rootbound.

Try heirloom varieties. These include 'Anasazi' beans, which are well adapted to hot, dry climates. Time planting to let vegetables get well established before warm weather. For planting times, check the *Sunset Western Garden Book.*

Plant in furrows. Dig furrows 6 to 8 inches deep, then sow or plant in the bottom of the trench, not on the sides or top of the furrow.

FROM LEFT: STEVEN A. GUNTHER, NORMAN A. PLATE, JIM MCCAUSLAND

Plant tomatoes deep for better roots; let roses form hips to slow plant growth.

Build basins around vegetables that need wide spacing—squash, melons, and tomatoes.

Plant tomato seedlings deep. Pinch off all but the top few leaves, then bury the exposed stem; extra roots will develop along it. (Note: This technique won't work for most other plants.)

Plant early-ripening varieties. They will need fewer irrigations.

Plant close together. Space plants so the foliage will eventually touch; this will shade the soil and discourage weeds.

Mulch heavily. See page 24.

ROSES

Plant bare-root. Winter planting gives bare-root roses plenty of time to get established before hot weather.

Cut back on watering after spring bloom. Many established roses—especially old shrub and species kinds—can get by on surprisingly little water.

Mulch heavily. See page 24.

Remove suckers. Wait until next winter to do other pruning.

Don't deadhead. Leave spent blooms in place so hips develop. This slows down thirsty growth.

ANNUALS

Use less-thirsty types. African daisies, California poppies, celosia, creeping zinnia, cosmos, dwarf morning glories, gaillardia, marigolds, nicotiana, portulaca, salvia, snow-on-the-mountain, verbena, and vinca can all get by on less water than most other annuals can.

Plant only for visual impact. Limit plantings to areas where they'll be seen up close, such as around patios. Or allow yourself just one spectacular container planting positioned at your entryway.

Start with small plants, or sow seeds. These will develop more extensive root systems than larger plants, using less water over the long haul.

Plant in part shade. Particularly in inland areas, provide shade from hot late-afternoon sun.

Work the seasons. Plant when the weather is ideal for quick establishment (in most cases, fall is the ideal time to plant). For planting times, see the *Sunset Western Garden Book.*

Group plants close enough that mature plants will completely shade the soil.

Mulch heavily. See page 24.

HOW SEASON AFFECTS WATERING

Plants use more water during hot, dry weather, so you need to irrigate more in summer than in spring or fall. (In winter in many areas, you don't need to water at all.) Also, wind dries out plants faster than still air, so plants require more water during windy weather. Day length also influences water requirements. From January until June 21 (summer solstice), days grow longer, while from late June until December 21 (winter solstice), they grow shorter. That's why in July, during a week of longer, 80° days, your landscape will require more water than during a week of 80° days in December.

As obvious as this sounds, gardeners often forget to adjust automatic controllers according to weather and seasons: Gardeners should water less in cool weather, turn sprinklers off altogether in winter or during rainy spells, and increase watering when it's windy or hot.

The illustration above shows the potential weekly water needs of a turf lawn in Northern California. The sprinkler run time (minutes column) is based on an application rate of 2 inches per hour spread over a week. It peaks in July and dwindles to nothing in midwinter.

Add mulch to save water

Mulch does wonders for garden soil. Here's how to put it to work.

No matter what condition your garden is in, adding a layer of mulch will give it a clean, freshly planted look. But the benefits of mulch are not just cosmetic. Mulching is one of the best ways to maintain soil moisture (and to save on your water bill), insulate roots from both heat and cold, and minimize the need to weed.

Depending on your garden situation, many materials can make great mulches. At right is a sampling of our favorites, which are widely available in bags or in bulk from nurseries and landscape supply centers. Here's what you need to know to get started.

Q: What exactly is mulch?
A: Generally speaking, mulch is any material that protects soil surface and allows air and water through. Mulch is useful over an area of bare soil and around planted areas. Organic mulches (derived from plant material) add nutrients over time and enrich overall soil composition, so they're hard to beat. Compost, aged manure, raked leaves, pine needles, and thin layers of lawn clippings (as long as they're herbicide- and pesticide-free) all work for various situations. You can also opt for an inorganic mulch such as gravel, granite, or stone.

Q: Will manure burn my plants?
A: It can burn plant roots if it's not well composted, so look for labels that specifically say "well-composted manure." Be sure to ask your supplier if you are purchasing in bulk.

Q: How much should I buy?
A: Determine the square footage you want to cover and use the following as a guide: A 2-cubic-foot bag covers an area of 8 square feet to 3 inches deep; 1 cubic yard of mulch covers an area of 108 square feet to 3 inches deep.

Q: How thickly should I apply it?
A: In general, the denser the mulch particles, the less you need. See sidebar at right for specifics per material.

Q: Any application tips?
A: Spread mulch to the appropriate thickness, taking care to keep it a few inches away from tree trunks and the crowns and stems of plants. If placed too closely, mulch can retain moisture and cause plants and trees to rot.

Q: How can I keep my mulch clean?
A: Inevitably, leaves and other debris will fall on your mulch. You can remove litter with a small hand rake. Some people use blowers, but lighter mulches may blow away along with unwanted material.

Q: When should I mulch?
A: At least once a year in early spring before weeds sprout. You can also add a layer as a top dressing in late fall.

Q: When do I remove it?
A: You can leave mulch in place indefinitely. Just scrape it aside if you want to plant in a mulched area.

Q: What's the best way to mulch container plants?
A: Use the same depth and application technique as for mulching on the ground.

6 BEST MULCH MATERIALS

1. STRAW Light, loose option lets water pass through easily; good around vegetable and strawberry beds. Buy at livestock-feed stores. Don't use hay, which has seed heads that may germinate into weeds. Apply 4–5 inches.

2. HAZELNUT HULLS Good for general use and ideal for paths because hulls let water through easily and don't stick to shoes. Most readily available in and around Oregon's Willamette Valley. Apply 2–3 inches.

3. CUT BARK Made from different types of wood based on where you live; a good all-purpose choice. The mini size shown here gives landscapes a polished look. Apply small size 2–3 inches; larger, 4–5 inches.

4. DECOMPOSED GRANITE (DG) Compacts quickly and doesn't tend to blow away. Especially attractive in Southwestern and desert landscapes, but can be prone to weeds. Apply 1–2 inches.

5. SHREDDED BARK Slow to decompose, with a more woodsy, natural look than cut bark. Irregular bits and shredded pieces knit together so it stays in place. Useful on slopes and in windy areas. Apply 2 inches.

6. TUMBLED GLASS Pricey ($3–$7 per pound or more), so used mainly to add color and punch to small areas.

How to fight drought

What to do immediately when water restrictions are necessary

If curtailed irrigation means your lawn turns brown, don't worry—you can fix it later (or take the opportunity to replace it with an unthirsty alternative). Instead, dedicate your water to nurturing established trees, such as Japanese maples.

When drought comes, and with it the possibility of local bans on irrigation or punishing hikes in water bills, what can you do? It's too late at that point to install a water-conserving landscape, since even drought-tolerant plants need water to get established. But you can take steps to save the plants you have.

Save established trees and shrubs first. These are costly to replace and have the greatest impact on your landscape. (A lawn can be replaced in an afternoon from sod, but a 70-foot-tall redwood can take decades to replace.) Landscape trees such as ash, birch, poplar (riparian trees that in nature grow near water), plus alder, coast redwood, magnolia, and Japanese maple are often the first plants to show signs of drought stress. Weakened trees like Monterey pine may not die directly from drought but invite borers, which can finish them.

Give the trees a deep irrigation in late spring and they'll be far better equipped to withstand drought. The roots of various plants grow to different depths; the trick is to apply just enough water to moisten the roots without going beyond. Most tree roots are located in the top 2 feet of soil. The drip line of a tree or shrub runs around the perimeter of the canopy and virtually outlines the root zone on the ground below. Once you identify the root zone, focus your resources on that area. To increase water penetration before watering, drill 1-inch holes 1 to 2 feet deep every few feet around the drip line and fill them with organic mulch, or use a spade or pitchfork to rough up the soil surface. If the soil is dry at a depth of 10 to 12 inches (check it with a sampling tube), moisten the soil 18 to 24 inches deep.

Coil soaker hoses around the tree at the drip line and halfway between the drip line and the trunk; apply mulch over the root area, then allow hoses to run slowly overnight. For most big trees, you'll need about 10 gallons of water per inch of trunk diameter; riparian trees need twice that amount.

Reduce lawn watering. To stay green all summer, lawns need 1 to 2 inches of water per week. Turn on the sprinklers for about 10 minutes once a week, turn them off to let moisture soak in, then turn them on again for another few minutes. Or cut back to 1 inch of water every two weeks; under this regimen, lawns turn straw-colored and go semidormant but bounce back quickly after weather cools in fall. Also, mow high and keep mower blades sharp. Don't overfertilize; too much nitrogen encourages the production of thirsty new growth.

Monitor landscape plants near lawns. Plants growing in or near a well-watered lawn become dependent on that irrigation. If lawn irrigation is cut off, those plants may need supplemental water.

Monitor shallow-rooted shrubs. On azaleas, rhododendrons, and young camellias, watch for wilting or drooping of new growth. Build basins around them (make sure water won't pool against the trunks), and give them a deep soak in April with clear water (soapy water, on rhododendrons, can cause leaf burn).

Mulch. It bears repeating: A layer of mulch helps keep moisture in the soil (see page 24). The best mulches (bark chips, for example) don't compact easily, but allow sufficient air and water to reach plant roots.

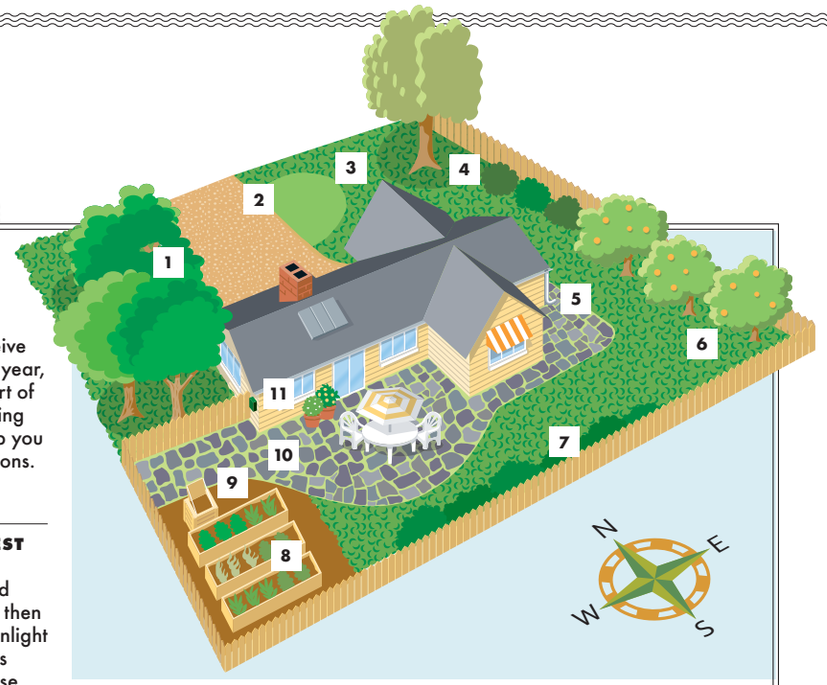
Irrigate fruit trees. Most stone-fruit trees can survive some drought, although they'll produce smaller fruits, and fewer flower buds next year. But they'll be better off with a deep irrigation in April and again in June. (Citrus may need additional deep watering in summer; watch for wilting, yellowing, or curling leaves.)

Apply water slowly and deeply at the drip line with soaker hoses as described for big trees; or make a basin 4 to 6 inches deep under each tree, extend it to the drip line (3 inches beyond if you can spare more water), and use a hose to fill the basin slowly.

Cover swimming pools. A good practice even when water use is unrestricted, covering an unused swimming pool during times of drought is especially important. A pool cover can stop 90 percent of water evaporation waste.

FROM LEFT: E. SPENCER TOY, THOMAS J. STORY; ILLUSTRATION: ANNIE BISSETT

THE BIG PICTURE



Many regions of the West receive less than 10 inches of rain per year, and periods of drought are part of the West's natural cycle. Keeping the big picture in mind will help you make smart landscaping decisions. Here are 11 water-conserving design fundamentals.

1. SHADE TREES ON THE WEST SIDE OF THE HOUSE Choose deciduous types that shade and cool the house during summer, then drop their leaves to allow in sunlight during winter. Unthirsty choices for mild climates include Chinese pistache and honey locust.

2. PERMEABLE DRIVEWAY Use decomposed granite or pavers with spaces between; this allows rainwater to pass into the soil.

3. LOW-WATER TURF If you must have a patch of lawn, keep it small and choose a grass that's appropriate for your region (see page 17).

4. PLANTS GROUPED BY WATER NEEDS Place thirstier plants together and drought-resistant plants elsewhere. Then put each group on separate irrigation schedules.

5. RAIN-HARVESTING SYSTEM Channel rainwater from your home's downspout into a subsurface catchment basin where it can replenish the groundwater.

6. DROUGHT-TOLERANT GROUNDCOVER For areas that don't get foot traffic, choose unthirsty groundcovers such as *Arctostaphylos uva-ursi,* Carmel Creeper ceanothus, low-growing junipers, or creeping thyme.

7. TOUGH SHRUBS Fill borders or spaces along fences with undemanding, low-water beauties such as chuparosa, lavender, rosemary, or smoke bush *(Cotinus coggygria)*.

8. DRIP-IRRIGATED RAISED BEDS FOR VEGETABLES Use drip tubing or soaker hoses in raised beds; they put irrigation water right where plants need it, with no runoff or waste.

9. COMPOST BIN Install a bin to turn your garden's brown plant waste into deep rich compost. Dig finished compost into the soil to improve the soil's water-absorbing capability.

10. PAVERS WITH SPACERS AND UNTHIRSTY PLANTS For patio surfaces, opt for pavers such as flagstones or recycled concrete pieces. Grow unthirsty plants such as creeping thyme or snow-in-summer in spaces between.

11. IRRIGATION CONTROLLER Install an automatic controller to schedule irrigation times. Reset programs seasonally and after power outages.

WHERE TO LEARN MORE

Local water districts provide a wealth of information, including recommended plant lists, irrigation guidelines, and water-saving tips. Look to them also for information about potential rebate programs that reward low-water landscaping and reduced household water use.

Websites maintained by state or nonprofit agencies offer myriad water-saving tips, design ideas, and local links. Four of our favorites: *bewaterwise.com* (Southern California), *saveourh2o.org* (California), *wateruseitwisely.com* (Arizona), and *snwa.com* (Southern Nevada).

PROFESSIONAL DESIGN HELP

Many landscape pros can help you implement a water-conserving garden. Before signing a contract, get several bids, talk with previous clients, and check out their work.

Landscape architects design entire outdoor environments, from plantings to structures like patios and decks. Licensed and university-trained, they can provide the whole package, from design to installation. Or they can help in specific trouble spots, such as steep slopes or areas with poor drainage.

Landscape contractors are trained and licensed in methods of earth moving, construction, irrigation, and planting. They are very useful for difficult projects.

Landscape or garden designers have varying degrees of education but are usually not licensed. The focus of their work is likely to be residential gardens. Often they work in conjunction with a landscape contractor.

Irrigation consultants are usually licensed contractors associated with an irrigation-supply store (another good source of information). They can help design and install efficient irrigation systems.

YOUR GO-TO GARDEN SOURCE

Subscribe to *Sunset* for inspiring ideas tailored to your climate each month. And get more inspiration from our companion books, including the indispensible *New Western Garden Book,* which uses the *Sunset* Climate Zone system to show you what to plant exactly where you live. Learn more at *sunset.com* and *sunset.com/zonefinder.*

HIRE A GOOD INSTALLER

Hiring a professional to help install an irrigation system is like hiring any other skilled contractor.

Get several quotes.

Ask for client references, and contact them to make sure they were happy with the work.

Ask to see a contractor's license, certificates of insurance, and proof of any special irrigation training.

Make sure you will get the features you want. Find out what brands and models of equipment (especially sprinklers and controllers) will be used and why.

Ask about plants in each hydrozone and how the system will need to be changed or updated as plantings mature.

If your landscape uses native plants, make sure the contractor has experience designing systems that suit the plants' special needs.

Discuss the main principles of irrigation and judge whether the potential installer knows up-to-date systems, particularly how to use the latest smart controllers.

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Be WATER SMART
Regional Water Authority