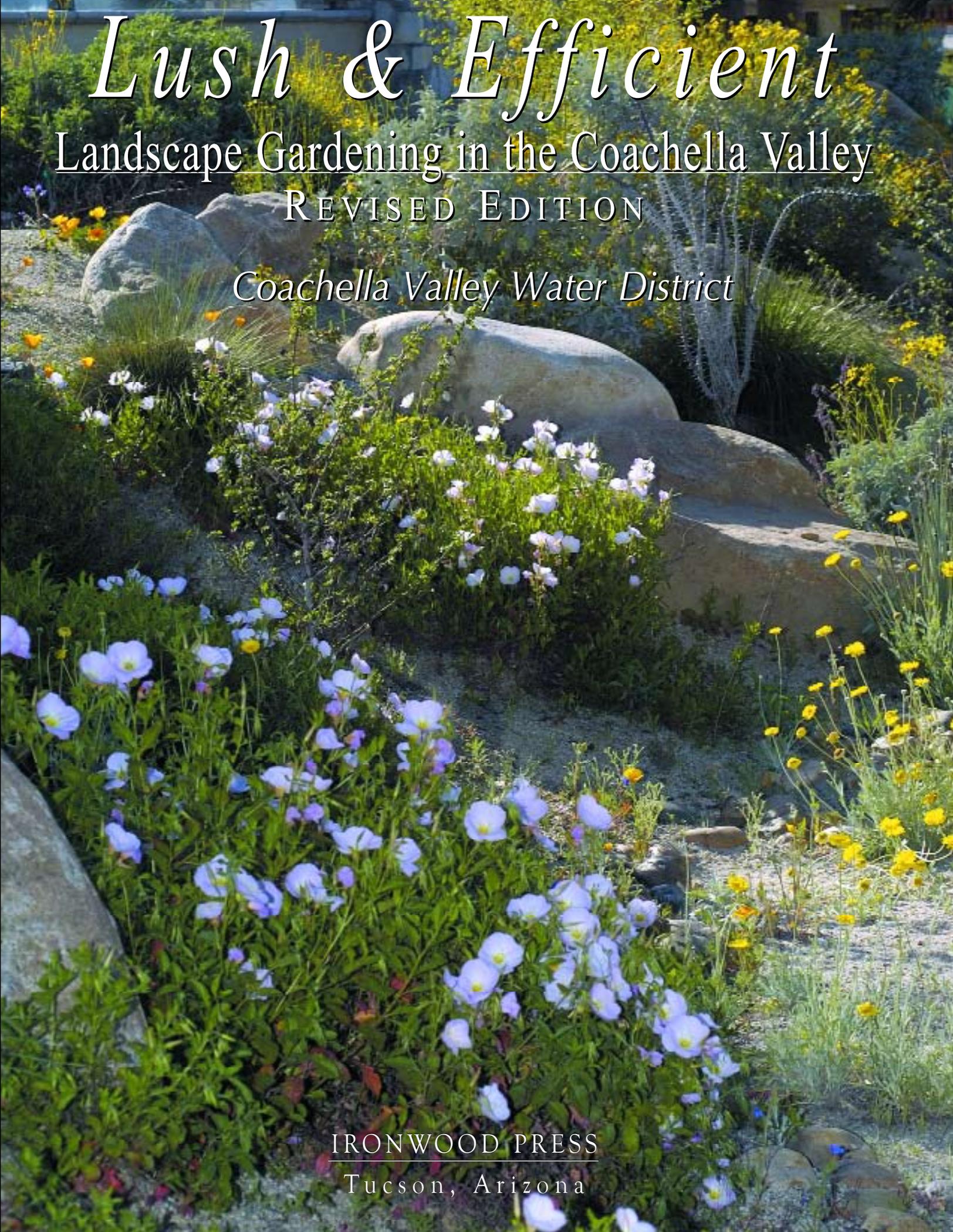


REVISED EDITION

Lush & Efficient

Landscape Gardening in the Coachella Valley

Coachella Valley Water District



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Coachella Valley Water District

Coachella Valley Water District, CVWD, is a local government agency controlled by five directors elected by the registered voters within its 1,000 square mile service area. That area in the southeastern California desert extends from west of Palm Springs to the communities along the Salton Sea. It is located primarily in Riverside County but extends into Imperial and San Diego Counties.

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◆ CHAPTER ONE ◆

The Desert Gardening Difference



Desert gardens can be lush *and* efficient. Contrary to the image of a desert landscape consisting only of cacti, boulders and gravel, many native and introduced dry-climate trees, shrubs, vines, ground covers and perennials have lush foliage, distinctive forms and showy flowers. In fact, a great many native Southwest desert plants provide even more color and interest over longer periods than their introduced tropical or subtropical counterparts.

About this Book

This book offers alternatives to high-water, high-maintenance landscapes in the Coachella Valley, typified by tall oleanders for screening and wind protection, formal trimmed hedges, large, thirsty canopy trees, expansive lawns and masses of spring annuals. New plants, new designs and new methods abound for area landscapes. Inside this book, you'll discover ideas for gardens that are a harmonious blend of the old and new: subtropical plants in a private patio garden, set off by a small lawn for close-up viewing and barefoot pleasure. This type of small yet luxurious garden, called a *mini-oasis*, is located where it can be most enjoyed—up close to the house and outdoor living areas.

Those who prefer low-maintenance gardening in tune with the desert environment may plant native and introduced, low-water-use trees, shrubs and ground covers, with cacti and succulents for accents. Building earthen mounds and dry creek beds and adding naturalistic groupings of boulders is just one method of creating an appealing focal point that requires little water and care.

The permanent resident can plan and plant for year-round enjoyment, while the seasonal visitor can create gardens that bloom for selected months during spring. How these gardens are created is up to individual tastes and budgets.

High-water use plants such as hibiscus, azaleas and philodendron typically have soft tissues that require regular moisture to survive. Many sub-

Left: Adapted low-water-use plants can thrive in even the most rugged locations. These brittlebush shrubs are growing in their native habitat near Palm Desert.

Above: White primrose and purple sand verbena announce the arrival of spring in the Coachella Valley.

tropicals and tropical plants (nurserymen nickname them “the green stuff”) are native to regions receiving 50 to 150 inches of rainfall annually. In the high temperatures and often low humidity of Coachella Valley summers, few introduced plants of this kind can survive without regular applications of water and shelter from sun and wind.

Water-efficient natives and many introduced plants indigenous to low rainfall areas of the United States, Australia, Africa and the Mediterranean region can be grown successfully in the Coachella Valley. Such plants have the proven ability to survive on little moisture after they have lived a year or two in the garden. Their physical makeup allows them to develop leaves, branches and roots that conserve what water becomes available. Some adjust to dry spells by going dormant until the next rain or irrigation. Acacias, mesquites, palo verdes, African sumac, sennas, Texas ranger, crape myrtle and Mexican bird-of-paradise are part of this group. Subtropical bougainvilleas, strangely, flower better when plants are stressed for water.

Overwatering often creates serious problems. A fine line exists between the correct amount and excessive moisture. Although newly planted plants need regular

attention to water needs, it is helpful to keep established plants on the dry side. Encourage deep and well established roots with deep irrigations. Plants are more self-reliant when they become conditioned to extreme heat, drying winds and cold.

The Economics of Landscape Water Use

Most of a homeowner's water use can be traced to *use outdoors* rather than *indoor use*. In fact, it's estimated that up to 80 percent of urban water consumption in the Coachella Valley occurs outside the house.

To reduce water bills, many have opted for a “minimalist” landscape—a few cacti adorning decorative gravel. Others, recognizing the physical and psychological cooling affects of lush landscaping, plant tropical paradises. Unfortunately, these types of landscapes require huge volumes of water just to keep plants alive through Coachella Valley's scorching summers.

However, home gardeners can have the best of both worlds—lush plantings that thrive with an efficient irrigation program. The formula includes selecting water-efficient plants, grouping plants of similar water needs, and proper installation and maintenance of an irrigation system.



The Coachella Valley is home to a wide range of climate and soil conditions. Selecting adapted plants and planting them properly will go a long way toward achieving success with your gardens and landscapes.

Ingredients of a Desert Garden

Heat

When summer temperatures reach 90°F to 120°F and humidity is low, the toll on young plants can be severe in a number of ways.

Temperatures in the upper layer of soil can increase, quickly killing new, shallow roots of annuals and perennials. Signs are brown leaf edges and wilting of new growth. In areas of sandy, rapid-draining soils, plants suffer due to rapid drainage of moisture away from the root area.

High heat is most stressful on plants grown in nurseries located in more temperate climates along the coast, then brought inland to the desert. The sun's intensity due to reflected heat from walls and windows adds to the stress, especially June through September with a western exposure. Details on how to develop a landscape that creates shade to reduce energy costs is described on pages 10 to 12.

Cold Temperatures

Coachella Valley frost patterns generally occur more frequently in lower elevations on clear and windless nights. Dry air temperatures drop about one degree for every 350 feet decrease in elevation. Cold air draining down mountain slopes usually settles in washes and in low pockets.

One sign of a potential for frost is when temperatures drop to 50 degrees before 9 p.m. in a clear sky and no wind. Average date for the first killing frost in the Coachella Valley is November 21, with the last frost around March 15.

During periods of low temperatures, tender plants can be protected by covering root areas with 2 to 3 inches of an organic mulch such as bark or aged, composted manures. Cold-tender plants in containers should be moved under the shelter of a wide overhang, patio overhead or canopy-shaped tree.

When selecting plants, be aware of their inherent hardiness to frost. (The cold hardiness of each plant described in this book is provided in the chapter *Success with Desert Plants*, pages 42 to 135.) One of the best methods of learning which plants are cold hardy enough to use in any landscape is identifying established, healthy plants in older gardens in the surrounding area.

Wind

The flow of winds and accompanying sand is one of the most trying experiences for gardeners in the Coachella Valley. Plants can help curtail the bite of wind and sand in the form of dense windbreaks (see pages 11 to 12).

They must be tall enough to reduce the wind's force.

Wind patterns coming through San Geronio Pass fluctuate with westerly storms and coastal fogs. They are most prevalent during late winter and spring months. Dust and sand begin to move when the wind reaches 15 miles per hour (mph) or more. Mild dust storms may develop at 20 mph. Severe sand storms, which can create havoc with windshields, paint, people and plants, usually develop at 30 mph or more.

Local winds contrary to the westerly flow often are stirred by the development of low-pressure areas in the lower desert or are brought in by tropical *chubascos*, storms originating off the west coast of Mexico or southwest of San Diego.

If winds are common in your area, locate plants in the garden with the wind factor in mind. In general, windbreaks should be sited perpendicular to prevailing winds. Fortunately, the flow of sand decreases with each new development, which helps anchor sand dunes. Walls, fences, hedges, lawns, gravel and ground covers also reduce the problem.

Coachella Valley Soils

Experienced dry-climate gardeners realize the impor-



Cold-tender plants such as citrus are more likely to escape frost damage in landscapes located at the valley's highest elevations, or on slopes, which allows cold air to drain down and away from plantings.

tance of managing soil, water and plants successfully. Fortunately, valley soils can easily be made more productive. In upland and eroded areas of the valley, soils are shallow and require more work to become acceptable for plant growth.

Caliche, also called *hardpan*, is a cementlike layer of calcium carbonate that accumulates below the soil surface. It can be a few inches thick to several feet thick, and is often encountered on slopes or flat areas. If a gardener's shovel bounces back when it strikes the soil, test for caliche. Pour vinegar or acid onto the area. If it bubbles, it's caliche.

Soils in the Coachella Valley fall into definite categories. Areas west of Palm Canyon Drive and south of Highway 111 in Palm Desert are sandy to rocky due to the area's alluvial structure. In some coves, wind-blown sand covers much of the ground. East of Palm Canyon Drive and north of Highway 111, most soils are predominantly sandy. In all instances, drainage of moisture is usually adequate.

Slow-draining soils can be found in La Quinta and points south. Here, gardeners must break through layers of silt or clay before water can drain. Silty sand builds up a crust that practically seals itself when water is applied. Commercially available soil penetrants made of sulfur compounds can be effective in combating this problem. Digging extra-wide planting holes and setting plants a bit higher when planting allows moisture to drain away from the plant's crown. These methods are necessary in La Quinta and some lower elevation regions.

Organic Materials: Mulches and Additives

The addition of organic materials such as ground bark, composted manures and planter mixes aid desert soils. Mixed thoroughly into the soil, these materials retain moisture aerate clay soils and provide roots with a better growing environment.

Mulching and additives can: prevent soil crusting, curtail weed growth, reduce need for cultivation, reduce water use and lower soil temperatures. Materials gener-



In many parts of the Coachella Valley, soils are almost pure sand. These conditions require that plants be given frequent irrigations due to the rapid drainage.

ally available include packaged composted ground bark, cotton seed hulls and composted sawdust. In extremely windy areas, adding a layer of gravel helps to hold the mulch in place.

Working soil additives into planting beds makes sand and loam soils better at retaining water. Soil around new plants should be blended well with existing soil. Be aware that you must add enough material to substantially change the soil's composition. The small chart on page 15 will give you a guide as to how much a 2-cubic foot bag of soil amendment will cover. Prepare soil a few weeks before planting to allow additives to better incorporate into existing soils.

The pH of desert soils is often *alkaline*, caused by an accumulation of sodium and calcium. Due to low rainfall, these two elements don't adequately *leach*, or wash away, if soils are heavy. Fertilizer such as ammonium sulfate or soil sulfur, worked thoroughly into the soil, helps lower the pH, typically to 7.2. Deep watering

in soil that has good drainage also helps alleviate the problem.

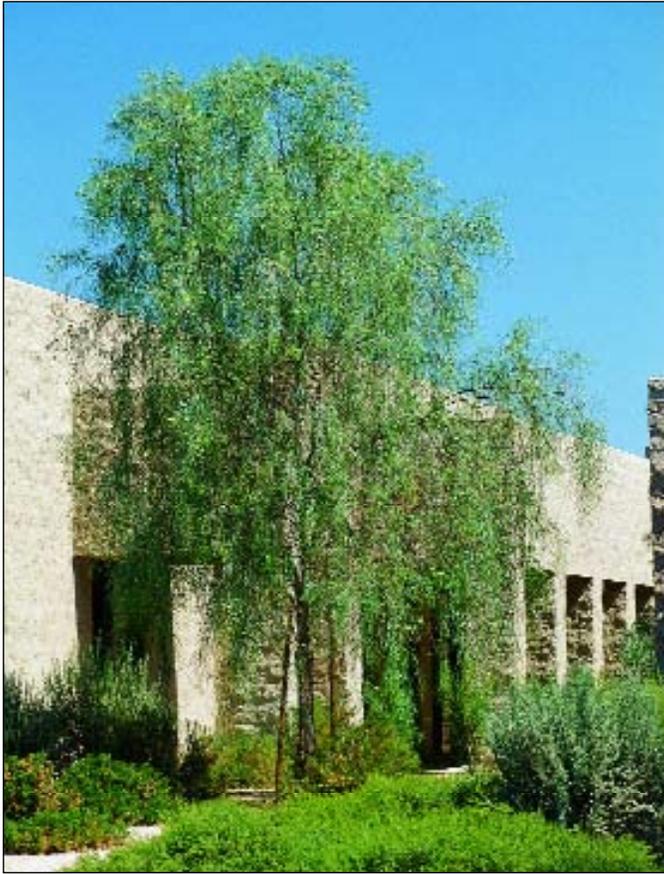
Salinity, or salts, can be a problem in heavy soils if there is not enough rainfall to move salts down and away from plant roots. Farmers flood fields to leach salts into underground drains. Adding iron sulfate or soil sulfur to planting areas can help the residential gardener combat salt buildup.

Many desert areas on *alluvial slopes*, areas of young, rocky soils at the base of mountains, have deep strata of decomposed granite, commonly referred to "D.G." These soils have been created by extreme water action of storms and the resulting runoff. Drainage is rapid. Plant roots grow well in such soils if given adequate moisture. However, when dry, alluvial soil is difficult to work. Mixing in soil additives and adding water to soil before digging and planting can help.



Left: Mixed thoroughly into the soil, organic materials retain moisture and provide roots with a better growing environment. Plants growing in close proximity to one another such as vegetables, annuals and garden perennials benefit from amendments. Many soil amendment products are available at garden centers or nurseries, or you can make your own compost.

Above: Compost is one of the best mulches and soil amendment available. In addition, a compost pile is excellent for recycling yard waste—grass clippings, leaves, pruned twigs—that would ordinarily find its way to a landfill. This simple compost pile takes up little space and is easy to make with cinder blocks.



Research shows that trees and shrubs strategically located around buildings dramatically reduce cooling costs. This tree is *Acacia aneura*, mulga acacia.



Shading air-conditioning units can reduce their workload, making them more energy-efficient.

Landscaping for Climate Control

When you live in a hot desert climate such as that of the Coachella Valley, you probably spend more money to cool your home than to heat it. And, as mentioned in the introduction, outdoor water use can be as much as 80 percent of a home's water consumption. Energy and water prices have been increasing and are likely to continue, prompting residents throughout the Southwest to find ways to conserve them both. There are some simple ways to conserve energy by using water-efficient plants in combination with appropriate landscape and irrigation system design.

How Plants Modify Climate

You'll quickly feel the drop in temperature on a hot day when you walk beneath the shade of a dense tree. Trees, shrubs and ground covers can greatly reduce cooling loads of buildings in hot, arid climates by modifying air temperatures and solar heat gain.

You can design or retrofit a landscape to keep cooling costs reasonable. Locating trees, shrubs and vines so they will shade homes can effectively lower the energy required to cool a home.

Plants also cool air around homes through the process of *evapotranspiration*. The evaporation of moisture at the leaf surface cools the air around the leaf. Research has shown that trees and shrubs placed in key locations around a home can reduce cooling requirements up to 24 percent. A mature, wide-canopy, shade tree placed to shade the south and west walls and roof of a home can cut cooling costs up to 42 percent.

It is necessary to know where the sun is in the sky when temperatures are at their hottest. The goal is to position plants so they will block the sun's rays. The path of the sun during summer is much higher than it is during winter. This means that summer sunshine tends to warm the east and west walls, as well as the roof. Winter sunlight strikes mostly south-facing walls.

Trees—Trees provide direct shade for outdoor spaces, walls, windows and the roof area of a home. The choice of tree types for summer shade could be either *evergreen*, where trees remain in leaf all year, or plants that are *deciduous*, when leaves drop and branches are bare in winter. In colder areas, it's a benefit to use deciduous trees. The bare branches during winter allow warming sunlight to reach walls and windows.

Keep in mind that many trees take five years or more



Oleander is a common windbreak in the Coachella Valley, but a recent viral infection has caused many stands to decline and die. See page 12 for a list of other suitable windbreak plants.

to provide any measurable shade. Some deciduous trees provide a shade canopy cover twice as fast as some evergreens. (Note: The relative growth rate of many trees are provided in the descriptions on pages 44 to 67.)

Ground Covers—Ground covers decrease heat around a structure and on walls and windows, thereby reducing cooling costs. In place of a sea of gravel, a landscape composed of ground covers, a small lawn and shrubs will greatly reduce heat gain around a home. The benefits of this cooling outweigh the additional cost of water to establish and maintain the plants.

Windbreaks and Hedges Help Control Climate

Windbreaks have long been a part of the history of the Coachella Valley. In the past several decades, thousands



of acres of orchards, date groves, vineyards, vegetable crops and small villages were developed from the Salton Sea to Palm Springs. Windbreaks of many kinds were planted to reduce the impact of wind and blowing sand. For example, without the blow-sand control offered by the rows of tamarisk windbreaks planted by Southern Pacific, railroad tracks would be quickly covered by sand dunes.

Development in the Coachella Valley continues to claim large acreages of sand dunes up to and across Interstate 10. The need for controlling blowing sand and dust becomes even more important as government laws for clean air controls are implemented to reduce the impact of blowing sand and dust.

Windbreaks also help control the burning and desiccating effects of the intense summer sun by creating cooler, sheltered small climates called *microclimates*. The single, double- or triple-hedge creates a more gentle climate around a home that allows more fragile plants to grow and thrive.

Windbreak Basics

Consider the intensity of the afternoon sun, heat and direction of wind when you locate trees and hedges for windbreaks, hedges and screens. One clue is to notice how plants are shaped (leaning) due to prevailing wind patterns.

Divert wind with height and density. Tall trees—to 40 feet or more high—can reduce wind velocity as much as 50 to 200 yards downwind. Study existing windbreaks in the region that are effective in helping control and divert wind. How are they placed, and which plants are being grown? What is the spacing between plants?

Multiple-trunk trees generally maintain better verti-



The photos above are the same windbreak near Indio, taken 7-1/2 years apart. Screening was used the first years after planting to protect citrus until trees attained sufficient size.



It helps to understand how exposure—north, south, east or west—influences plant growth. South and west exposures are much warmer, plus reflected sun in these exposures can quickly damage unadapted plants. The ocotillo and bougainvillea shown in this home landscape will accept the intense heat of a western exposure.

cal growth under the stress of wind. Even with dense foliage, pines and cypress withstand heavy or constant winds with a rugged persistence.

All windbreak trees must have deep irrigation to survive. Drip irrigation has proven to be ideal in helping trees develop deep roots.

A triangulated pattern with 12- to 18-foot spacing of

Trees and Shrubs for Windbreaks

Acacia aneura, Mulga Acacia
Brachychiton populneus, Bottle Tree
Ceratonia siliqua, Carob
Cupressus arizonica, Arizona Cypress
Cupressus glabra 'Gareei', Rough Bark Cypress
Eucalyptus microtheca, Coolibah Tree
Eucalyptus spathulata, Swamp Malee
Pinus eldarica, Afghan Pine
Pinus pinea, Italian Stone Pine
Rhus lancea, African Sumac

trees, with lower ground level 10- to 12-foot shrubs and conifers with great density, can create a strong barrier against wind.

Grouping Plants by Sun and Water Need

Plants that are efficient users of water employ many tricks to stay alive. Some go dormant in the summer. Others have modified leaves that conserve available moisture. Leaves may have a small surface area; be it thick, waxy or leathery; or fuzzy or hairy. Other plants have green trunks and branches that carry out photosynthesis. Still others have well developed, deep root systems designed to absorb available moisture. Some have seasonal adaptations. For example, deciduous plants may require more water in summer, but survive on much less water in winter.

Often, a plant's water needs change as they begin to mature. Many fast-growing young plants require a lot of water the first few years, but as growth slows with age and a deep root system develops, they may require only



Microclimates, the small climates around your home, can be used to your advantage. This protected spot is an ideal location for cold-tender plants.

occasional deep watering.

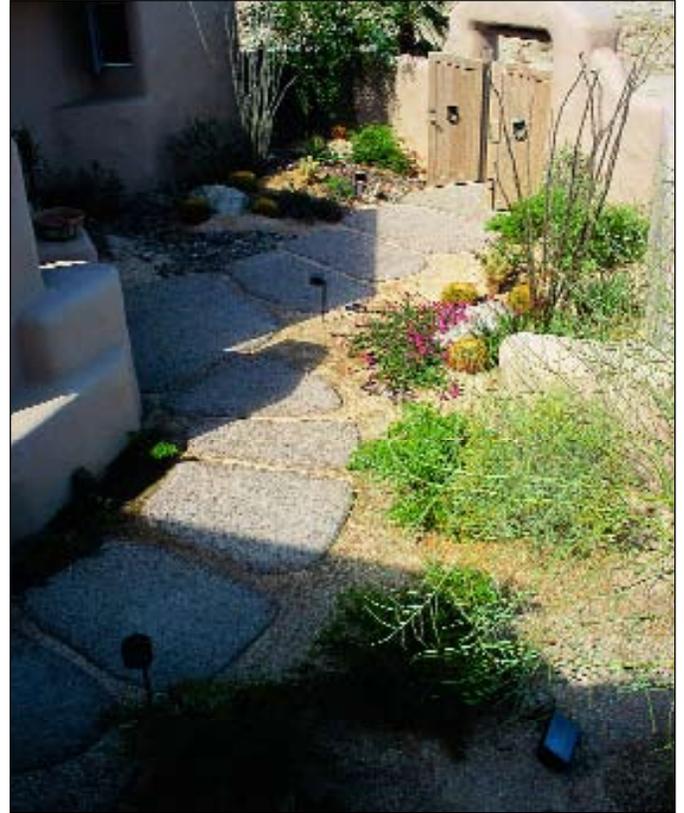
It is important to keep in mind that not all *native* plants use less water than plants introduced from another region. Some plants native to riparian (streamside) areas, such as cottonwoods, are high water users with aggressive roots.

Matching the Plant with the Exposure, The Exposure with the Plant

Plants are born with inherent tolerances to light and heat. When you have a location at your home in mind as to where you want to place plants, understand the exposure—north, south, east or west—and select a plant that accepts the growing conditions there. This method usually works better than buying a plant you like and trying to find a proper exposure to match. Here are the common exposures, and what plants will have to tolerate to survive:

South and West—The west exposure with its intense afternoon sun is by far the most difficult growing location. During the summer months the searing heat can overcome many plants. A south location has the benefit of being warm in winter, receiving sunshine during all seasons. Only sun- and heat-loving plants will thrive when planted in a south or west exposure.

East—The east side of a building or wall is probably the ideal exposure for most sun-loving plants. Some plants



Shade cast by trees or buildings create cooler, more protected planting sites. Eastern exposures are well-suited for plants that wilt in full sun.

may be heat-tolerant, yet are easily burned by direct, hot afternoon sun. Such plants will thrive along the east side of a structure, where forgiving shade is cast during the afternoon. Plants that tolerate some shade also belong in this exposure.

North—The north side must be used for shade-loving plants, but during midsummer months, it, too, receives some sun. Certain plants in this north exposure may need protection from the afternoon or morning sun during this period. Plants with limited heat tolerance belong on the north side of structures or trees. When working with this group, be aware of any reflected heat from adjacent sidewalks, driveways, streets, masonry walls or water features.

Expand planting areas for the most sensitive plants by taking advantage of shade from trees and structures. The filtered shade of a canopy-forming tree such as many acacias, mesquite or palo verdes becomes an ideal place for plants prone to sunburn. This is especially true if they are in containers, which eliminates the problem of roots competing for water. Extremely sensitive, cold-tender plants should be potted so they can be moved to appropriate protection as seasons change. These plants must be located carefully, considering the variables of their exposure, spacing, cold tolerances and water requirements. Not all are thirsty!

Hydrozoning: Grouping Plants by Water Use

Grouping plants according to their moisture needs is called *hydrozoning*. This helps in the design and application of drip-irrigation systems, which are just as valid for low-water-use natives and other dry climate plants as for subtropicals requiring high water applications.

Plants with the highest water use should be closest to the area where you spend the most time outdoors, such as planting areas near patios and at home entrances. This *high-water zone* is the prime location for annuals and luxuriant, water-thirsty subtropicals and other high-water-use plants. Some people also call this a mini-oasis, creating a cooling, colorful oasis of plants.

Vigorous, unfussy shrubs and trees, such as the sennas, Texas rangers and mesquites, are planted in the *moderate-water zone*.

In dry climates, the *low-water zone* is usually farthest from the house and water supply. Plants are not usually viewed close up. For this reason they can have coarser textures, and do not have to be maintained at optimum water applications.

Selecting and Buying Plants

When buying plants, keep in mind that extremely large plants such as boxed trees take much longer to become

established than a plant set out from a 5-gallon or 15-gallon container. Unless extremely slow-growing by nature, a smaller plant usually establishes itself faster than a larger one, and may even outgrow it. A smaller plant has the added advantage of reduced cost, and usually reacts more favorably to transplanting than a larger plant of the same species.

Mail-order plants—These are often shipped from suppliers in the Midwest or East, and generally arrive too late in the growing season for Coachella Valley gardens. Order only if the shipper will guarantee delivery for planting in January or February.

Bare-root plants—Roses, grapes, and selected fruit and shade trees are generally available “bare root” in nurseries from December through February. They are graded by trunk diameter and height. Medium-sized plants are preferred for planting.

Flats, pots, packs and quarts—Nurseries usually supply annuals, perennials and ground covers in these types of containers. Avoid plants that seem overgrown for their container, that are heavy with mature flowers, or are too succulent. Select plants with fresh growth and are adorned with buds ready to bloom.

Gallon, 5-gallon, 7-gallon and 15-gallon containers—Pass on plants that have heavy pruning cuts, or are oversized or root bound. If containers are filled with roots,



When shopping for plants, keep in mind that smaller plants generally establish faster and transplant easier than larger plants of the same species. Look for uniform, healthy growth, and avoid plants that are root bound.

How Many Plants do you Need?

100 plants . . .

Spaced 4 inches apart will cover 11 square feet.

Spaced 6 inches apart will cover 25 square feet.

Spaced 8 inches apart will cover 44 square feet.

Spaced 10 inches apart will cover 70 square feet.

Spaced 12 inches apart will cover 100 square feet.

Spaced 15 inches apart will cover 156 square feet.

Spaced 18 inches apart will cover 225 square feet.

How Much Soil Amendment do you Need?

2-cubic foot bags . . .

1 bag covers 175 square feet 1/6 inch deep.

1 bag covers 54 square feet 1/2 inch deep.

1 bag covers 27 square feet 1 inch deep.

plants are probably stunted and seldom develop normal growth. (Trees often become overgrown in containers.) Also avoid plants with sunburned trunks, cracked trunks, severely trimmed branches or binding tree ties. The best and healthiest specimens will have fresh, new, vigorous growth.

24- to 60-inch boxed trees—These are often field-grown, then transplanted into boxes to establish and regrow.

When shopping for plants, consider the following important aspects of knowing and understanding plant performance. Get to know:

- Size and width at 5 years, 10 years, maturity
- Rate of growth: slow, moderate, rapid
- Flowering habit, bloom period
- Foliage type: coarse, medium, fine
- Water requirement: low, moderate, high
- Nutrient needs: native plants require minimum
- Preferred soil type and soil drainage requirement
- Exposure: reflected sun, sun, filtered shade, shade
- Hardiness to cold, heat, wind
- Relationship to other plants: “plant partnerships”
- Ideal planting season

Pruning by the Seasons

When you prune, you are directing plant growth. It is important to keep some key rules in mind that will help in maintaining or modifying the plant’s structure.

Through all seasons in Coachella Valley, plants have a greater vitality when given reasonable care and supplied with adequate moisture. Pruning, shaping, thinning and dead-heading flowers become important regular aspects of plant maintenance—more important than many gardeners realize.

There is a lack of understanding by many people concerning how to maintain water-efficient plants in dry

climate regions. Proper pruning, thinning and trimming promotes healthy, attractive growth, maintains a natural form and reduces garden work, as well as debris.

Some Pruning Basics

Good pruning and shaping techniques begin with plant selection. The gardener must consider rate of growth and mature size; plant form and texture; location related to sun, shade and soil type; flowering habit and spacing for width, height and proximity to structures, walks and pedestrian traffic areas.

Poor pruning practices are often perpetuated by a lack of knowledge about plant growing habits and flowering periods. Contributing to the problem is the over-planting of many new gardens, done to achieve an immediate mature effect.

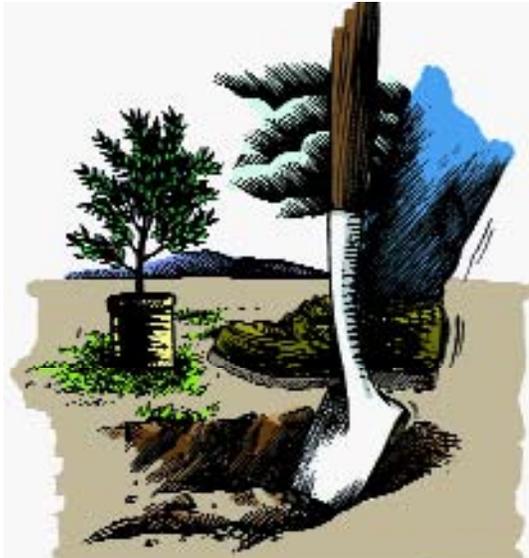
Follow these guidelines to help gain an understanding of this most misunderstood gardening practice.

Cold-hardy plants can generally be pruned in late fall to early winter. Subtropical and tropical plants respond better when pruned in late spring and early summer.



Prune carefully to direct growth and to control wayward branches. Gloves help this gardener protect his hands from the sharp thorns of bougainvillea.

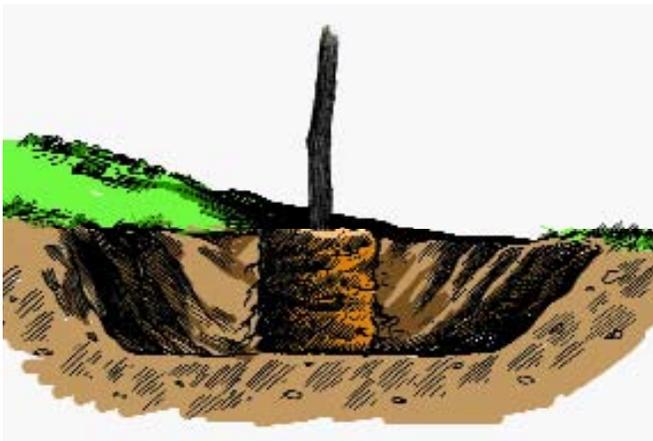
Planting Step by Step



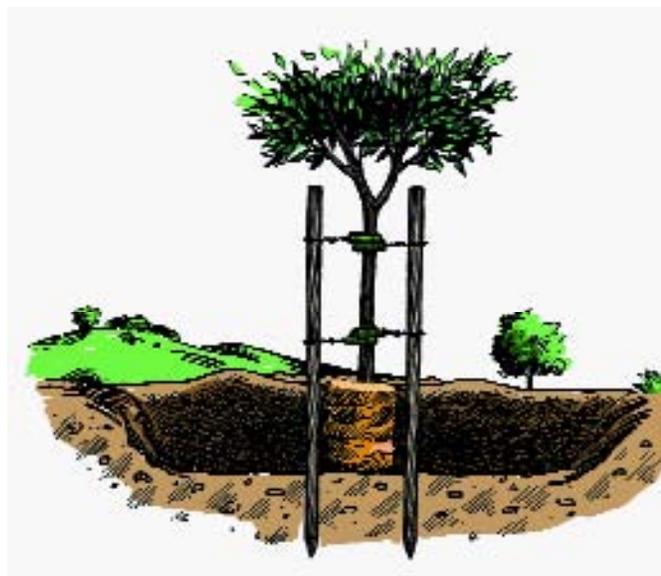
1. Plant as soon as possible after purchasing to prevent drying out of the rootball. Best idea is to dig planting holes before buying plants. Prior to planting, water the container well to ensure the rootball soil is moist. Remove the plant from the container. If plastic, turn upside down and knock the edge against a hard surface to gently slip the rootball out. Handle plant carefully by its rootball—not by the stem—this helps avoid injuring the roots.



2. Dig holes for plants so they are at least three times wider than the rootball. It helps root growth if the ground is loosened beyond a plant's *drip line*, the area near the perimeter where rainfall will naturally drip off the plant to the ground. Fill hole with water to moisten the surrounding soil before planting. If water does not drain in an hour or two, dig deeper for more adequate drainage or select another planting site.



3. Place rootball in planting hole and add soil mixture, firming it around the rootball. Water plant and add soil mixture around the sides to eliminate air pockets. After soil settles, add more soil so that it reaches the top of rootball.



4. Use soil to build a basin around the perimeter of the rootball. It should extend to about three times the size of the rootball. Make the height of the basin so it will hold at least 3 inches of water. If planting a tree that needs support to stand on its own, supply two stakes, and tie them loosely to tree as shown above.

- Remove broken, diseased or dead wood from trees and shrubs at any time.
- Remove crowded stems and weak growth to help plants develop balanced structure and form.
- Naturalistic pruning—light, selective removal of branches and limbs, allows plants the opportunity to grow as nature intended. Hedge-sheared plants are robbed of their individuality, flowers and natural beauty.
- Cut stem stubs close to a main stem to aid healing.
- Nip tips of new growth to increase bushiness.
- Fast-growing trees such as the many acacias, elm, eucalyptus, mesquite, palo verde, and bottle brush need thinning to reduce chances of wind damage.
- Remove sucker growth on trees to prevent branch growth in the wrong locations. Pull, rather than cut, for best results.
- Pruning citrus trees requires a special approach. For detailed information, see page 149.
- Pruning tools work much better when you keep them sharp. Also be sure to use the right size pruning tool for the job.
- Better plant shape and regrowth develops when plants are pruned gradually over a period of time in contrast to once-a-year heavy pruning. As a rule, remove no more than 20 percent of the plant's foliage at any one time to avoid stress and sunburn of trunk and branches.

It is seldom too late to correct past pruning errors. Plants have a great ability to recover from poor pruning. You can improve their appearance with time and adequate care.

Topping Trees

Tree topping, also called *heading*, refers to the removal of major portions of the tree's crown by cutting branches to stubs or to the main trunk. This type of negative pruning is most conspicuous on eucalyptus and mulberry trees.

This mutilation results in clusters of stems emerging below the stub cuts, creating excessive, small, weak branches that later become vulnerable to breakage. The new growth can increase wind resistance, as the mass of branches become a "sail" in the wind, often causing extensive damage or loss of the tree. On a small scale, topping creates openings for invasion of rotting organisms. Stubbing branches also upsets the entire growth pattern of the tree. Over a period of time, the tree will generally decline in beauty and effectiveness, with a decrease in monetary value by 20 to 50 percent.

The Irrigation and Pruning Connection

The relationship of irrigation and pruning is a close one. The amount of water applied directly affects the amount of pruning needed. *Overwater*, and growth can be too lush and succulent. *Underwater*, and plants become



You can improve the appearance of many ground covers by cutting them back every few years, preventing dead stems from mounding. *Baccharis* at left was cut back, shows fresh new growth.



Avoid topping trees. It ruins the tree's form, shortens its life and may cause it to become a hazard.

stressed, reducing healthy growth and inviting attacks from pests and diseases.

Proper irrigation is one of the most important elements of growing healthy trees. Deep watering with drip irrigation that places moisture deep in the root zone is recommended. It can be provided by an irrigation schedule that takes into account the size of a tree and its root system. Trees in turf areas without drips or bubblers often have problems related to surface roots, and lack deep roots to help stability and resistance to heavy winds.

Fertilizing

In many parts of the Coachella Valley, sandy soils and rock-and-sand soil combinations are common. They have excellent drainage qualities, but tremendous amounts of water must be applied frequently to keep plants alive when temperatures are high. Rapid soil drainage and frequent irrigation *leaches* (washes) plant nutrients, particularly nitrogen, away from plant roots. This results in a need to replenish these nutrients more often.

Because of the rapid leaching of nutrients from the root zone, you get better results by applying fertilizers more often and in smaller doses. Adding soil amendments in the form of organic materials is also useful to counter nutrient loss from leaching. Ground bark and compost are examples of materials to add to the soil to help retain valuable moisture and nutrients.

The availability of fertilizers packaged for specific plant types and uses reduces the need to do your own mixing of nutrients. Commercially available citrus food, rose food, palm food and lawn fertilizer make fertilization programs simple. In all instances, closely follow all product label instructions.

After many years of testing in commercial projects and in nursery growing operations, slow-release fertilizers have become useful products for the home gardener. They can be added safely to the soil mix at planting time in close proximity to plants' roots. They provide proper nutrients over many months, reducing time and expense while improving plant growth.

Fertilizing According to Plant Type

New plantings of shrubs and trees will accept a well-balanced application of organic plant food by the second or third month after planting. Azaleas, camellias and gardenias generally need acid-type nutrients when plants complete their bloom cycle. Continue applications monthly through summer. Citrus trees maintain a good growth pattern when fertilizers are applied regularly from February to the first part of September. Roses

need a steady diet from early spring into late fall, based on their bloom cycle. It is helpful to remember that when roses complete a bloom period, it's time to apply a balanced rose food.

Lawns respond with vigorous growth when given high nitrogen fertilizers. For Bermudagrass lawns, provide a monthly application through the warm months. For ryegrass, fertilize through the cool months. Fertilizing properly helps keep a lawn healthy, and helps prevent weeds from becoming established.

Deep-rooted trees often require deep applications of nutrients. This can be achieved by placing three or four slow-release tablets into 12- to 18-inch-deep holes dug into the soil around the dripline. Deep watering is also essential.

Annuals, perennials, and ground covers often have shallow roots, so pelletized types of fertilizer are safest to apply. Neglecting fertilizer applications can cause slow growth to the point where plants become stunted.

Liquid organic fertilizers are easy to use. The reaction period is fast and safe, and they can be applied more often. Dichondra lawns, ground cover plantings, and newly planted annuals and perennials respond readily and favorably to liquid fertilizers. As with all fertilizer products, read and follow product labels carefully.

As mentioned, continuous leaching can cause problems in availability of nutrients in the soil. Plants show a need by a yellowing of leaves, called *chlorosis*. It can be caused by the lack of available iron or other elements in the soil. In such cases it can easily be identified: Leaf veins remain green while the rest of the leaf turns yellow. Apply iron chelates as soon as it is noticed.

Fertilizers continue to be improved by manufacturers. They are becoming more specialized for various kinds of plants. Seek advice from your nursery on the current fertilizers that may be best suited for the plants you are growing.

Mulching to Save Water (and More)

Covering the soil with a layer of organic material prevents soil from crusting, which reduces the need to cultivate. Mulching also improves soil structure and lowers soil temperatures.

A layer of mulch should be about 3 inches thick. In large open areas, mulches can help reduce weed populations and add a decorative covering.

Mulches cool the upper layers of soil. The sun can bake the top inches of soil, damaging fragile roots that grow near the surface. Soil temperatures in mulched areas can be 8 to 10 degrees cooler compared to soils without mulch.

Mulches maintain uniformity of soil moisture more



A simple layer of mulch over the root area of plants helps in many ways. It conserves moisture by reducing evaporation, insulates the upper layer of soil, and cuts down on weed growth. Over time, an organic mulch will decompose, helping improve the soil.

readily. In areas where a silty layer of soil affects the flow of water into lower layers of soil, a mulch reduces the air-tight silt layering, allowing moisture to penetrate to lower layers.

Materials that are generally available as mulches include organic matter such as ground bark, composted redwood sawdust and compost. Gravel or rock are coverings and do not improve soil structure. Bark chips and bark chunks can be used, but when kept moist, they turn an unattractive gray color in just one season. Strong winds, common in the Coachella Valley, can also blow them away from plantings. Animal manures are not satisfactory as a mulch due to problems with salt accumulation. They should also be well-composted before applying around plants.

As mulches decompose and combine with the soil, it is necessary to replenish them. Mulches that tend to remain soggy should not be allowed to come in constant

contact with stems and trunks of plants, or fungus and disease problems may occur.

Controlling Insect Pests

In many cases you can identify insect culprits by the damage they inflict on leaves and other plant parts. Fortunately, the number of pests in the Coachella Valley are seasonal and the majority of native shrubs, trees and ground covers are bothered by few, if any, insect invaders.

Sucking Types of Pests

Aphids leave their mark with curled leaves, distorted new growth and damaged flower buds. Their first arrival coincides with the burst of new growth in the spring, their most vigorous period of activity. Aphids come in many colors—black, green and yellow—and can literally cover lush tips of new leaves and stems.

Because injury is caused by their sucking of vital juices, you can control them with sprays. Sprays can be *systemic*, which means that they are absorbed by the plant and kill the pests when they tap into the sap of the plant. Other sprays kill insects by contact.

To avoid killing natural predators such as ladybird beetles (ladybugs) with an insecticide meant for aphids, you can wash off the pests with a blast of water from a garden hose. Spray as soon as you see evidence of their activity and repeat twice weekly while pests are active.

Aphids prefer roses, some annuals, new growth on pyracanthas, oleander and even citrus. Vigorous-growing plants such as oleanders usually have no problem outgrowing their damage.

Spider mites cause leaves to be mottled, stippled and sometimes turn yellow. Most damage occurs with arrival of hot weather. Shaking suspect leaves over a clean sheet of white paper will show spider mites if they are present. They are so tiny that a magnifying glass must be used to see them in detail.

Mites attack citrus, and are common pests on conifers such as Italian cypress and prostrate junipers. Follow the same controls as with aphids. If infestations are severe, treat with a miticide. However, the best defense is a good offense. Keep plants watered properly, not too much or not too little, and they will be more healthy and resistant to pest attacks.

Chewing Types of Pests

Thrips are practically invisible, but leave behind their marks on the surface of leaves and fruit, causing them to form streaky, distorted scar tissue. Their most active period begins during the warming trend in early summer and again in early fall. Controls are the same as with aphids and spider



Be on the lookout for aphids in early spring. They love to attack tender new growth.



Ladybird beetles (ladybugs) are beneficial insects, preying on insect pests such as aphids (left).

mites.

Beetles, caterpillars and grasshoppers leave behind ragged chewed-out spots on leaves and flower buds. Some critters even roll up leaves; others cut off stems of succulent annuals below the soil line.

Many systemic controls are available. Other controls are sprayed on leaves and stems to kill on contact.

Lawn moths and their caterpillars are only evident when you see the moths flying around at dusk over the grass, preparing to lay eggs. The caterpillars that hatch from these eggs do the actual damage. Apply controls to the grass. In severe or questionable situations, contact a local nursery for the most current controls available. Improvements of sprays and dusts are being made continually.

Caution: The incorrect use of pest control chemicals can be extremely dangerous and hazardous to plants, pets and people. Read all product labels and follow instructions carefully.

Preventing and Controlling Diseases

A preventive control program is probably the best method to reduce fungi or other plant diseases on susceptible plants. Major plant diseases in the Coachella Valley often involve

citrus, oleander, roses and annuals such as petunias, vincas, and zinnias.

Poor soil drainage—made worse when excessive soil is piled high on the *crown* at the base of a tree—as well as sunburn damage to stems, can bring on *gummosis* disease on citrus. Indications of this disease are the formation of lesions in the bark near the bases of stems. Discolored sap may flow from the infected area. For controls, see Citrus, page 150.

Overhead watering of roses in the evening hours during periods of high humidity can bring on mildew. You'll see it as a gray, powdery covering on new foliage and buds. Apply sprays or powders to treat at first sight. Avoid by watering at ground level and during early morning. Zinnias and grapes are also susceptible to mildew. It may be helpful to grow plants or varieties that are less susceptible. Contact your nursery or cooperative extension office for recommendations.

Oleander leaf scorch deserves special mention. It's a bacterial disease believed to be spread by the glass-winged sharpshooter, a native leafhopper insect. Symptoms are brown leaf tips, with dieback first spreading to branches, then to the entire plant. The bacteria shuts down the

plant's water-conducting system, eventually killing the plant. Currently, plants 20 to 30 years old are most affected. In addition to oleanders, other plants may be susceptible. At this time there is no cure. Contact your local cooperative extension service for help in identifying this disease.

Weed Control

When you engage in a constant struggle to control weeds, you need to evaluate the costs, methods and effectiveness of using chemicals and their impact on the environment—both local and the entire world.

It's important to control weeds in gardens and landscapes to reduce aggressive competition for water, garden space and nutrients. A weed-free garden is more attractive and more healthy.

Several options are available to control weeds. They include hoeing, cultivating, mulching to reduce their numbers (and make them easier to remove), pulling by hand, applying chemicals and using the solarization method, described below.

Above all, try to keep weeds in check by controlling them on a regular basis. If you see them, pull them. One of the best times to engage in a weeding session is right after a decent rain. Then, when the soil is moist, weeds can be pulled fairly easily, roots and all. Don't leave weeds on the ground where their seeds can continue the cycle. Toss them in the trash.

Using the Sun for Weed Control

Solarization uses the sun to kill weed seeds. It is a simple but effective weed control method that is even used by commercial vegetable growers in the Southwest. A similar process applies to the home garden as well.

The process begins after the weather heats up—late spring to early fall. Soak the area to be treated so moisture reaches 6 to 12 inches deep. Cultivate soil 4 to 6 inches deep. Lay clear plastic over the area. Shovel soil over edges of the plastic covering to seal in heat and to hold the plastic in place. Allow seeds time to germinate, which will take 2 to 4 weeks. The build up of heat under the plastic quickly kills weed seedlings. After seedlings have been killed, remove the plastic and dead growth. Work the soil well before planting your wildflowers, vegetables, annuals and perennials.

For weed control methods that require chemicals, seek advice at your nursery for recommendations on products and application methods. Grassy weeds such as Bermudagrass, nutgrass or Delhigrass require a material that is absorbed into the root zone. Broadleaf weeds such as Russian thistle, spurge and others have spray materials formulated specifically for their control. In all cases, apply chemical applications carefully on windless days to prevent harming humans and pets. Follow all directions on the product label.

Month-by-Month Gardening Calendar for the Coachella Valley

January

January is usually our coldest month, with pleasant days and cool nights. There's even a chance for frost.

Lawns overseeded with ryegrass need regular moisture and weekly mowing. If yellowing occurs, apply high nitrogen fertilizer.

This is the last opportunity to plant bare-root roses, grapes and deciduous fruit trees. Prune your roses and deciduous fruit trees this month. By now, red bird of paradise have gone dormant. Cut back stems to about 18 inches above ground level.



Plant cool-season vegetables and herbs.

January is the ideal month to make additions or changes in the garden while temperatures are kind. It is a good month to retrofit your garden. (See also December.)

January: protect citrus fruit.

Now's the time to transplant cold-hardy plants, including perennials.

Check tree stakes and ties for support against strong winds common in the spring months.

February

Warming trends this month set the stage to fertilize citrus trees. Water annuals and perennials diligently. Control winter weeds.

Complete pruning of roses and deciduous fruit trees.

February is an excellent time to plant shallow-rooted ground covers, native plants and other low-water use plants. Hold off planting frost-tender plants such as citrus and bougainvillea until next month, to



January: prune when plants are reaching dormancy.

avoid a possible late frost.

Continue to plant winter vegetables. (See page 145.)

Check plants for aphids or other pests and control as soon as you notice them.

Begin deep root watering of trees in anticipation of spring growth surge.

March

The warm, mild weather of March prompts rapid and excessive growth of plants as well as insect pests. Roses, citrus and hibiscus are most susceptible. For aphids, wash them off with a strong jet of water. If this does not work, check with your nursery for a safe product. When thrips attacks citrus, they cause leaves to curl and scar fruit rind. Control is difficult. Take some comfort in the fact they will be gone soon. White flies are attracted to bright yellow. Place a sheet of yellow cardboard covered with petroleum jelly near susceptible plants to capture them.

To reduce fruit set, spray olive trees with a flower con-



March: Add mulch to conserve soil moisture.

trol spray while trees are in bud. Spray again when two-thirds of blossoms are open.

Fall-planted annuals reach peak bloom in March. Thin any crowded plants. Pinch back stems of snapdragons to cause new flowering stems to develop.

Apply crabgrass control to lawns.

Water needs increase for all plants as temperatures rise. Reset irrigation system amounts to provide more moisture. Consider purchasing a weather-based irrigation controller. It adjusts to conditions automatically.

Fertilize citrus, lawns, perennials and vegetables.

As flowering bulbs complete their bloom, remove old



Animal pests will want their share of spring flowers.

flower stems.

Plant landscape plants as soon as possible this month if you missed the fall planting season to help them to become established before summer heat arrives. Most Southwest desert native trees and shrubs do better without fertilization.

April

This is a great garden month and a time when the color season reaches its peak. April is also the ideal planting month for tropicals that are sensitive to cold such as bougainvillea, hibiscus, lantana, cape honeysuckle and citrus.

Begin preparing soil in sunny beds to plant warm-season annuals such as marigolds, periwinkle and zinnias.

If periwinkle plants wilt and die, they likely have periwinkle wilt. Remove and discard plants.

Bermudagrass should be “encouraged” this month. If lawn was overseeded with winter ryegrass, cut rye low, which slows its growth, giving the dormant Bermuda the opportunity to regrow. Apply high-nitrogen fertilizer and water it in thoroughly.

As temperatures increase in the latter part of April, winter annuals will begin to lose their vigor. Remove plants as they fade or begin to die out.

Prune and thin sennas and Texas rangers into a natural form after flowering ceases. Your goals are to control growth, yet increase spread of plants and create additional wood for the following flowering season.

If you didn't do so in March, review irrigation schedules (both mechanical and hand watering) and increase water to accommodate the increase in temperatures.

Deadhead (remove) spent flowers and fertilize roses after each bloom period for a final crop before hot weather.

Control weeds and Bermudagrass in flowerbeds. Don't put this off; regular weeding prevents disaster.

May

May brings the first touch of summer, which begins to affect plants in many ways. The heat also slows human activity in the garden this month.

Review drip irrigation systems and flush out lines to eliminate dirt and debris that could clog lines or emitters. Increase watering amounts to about twice the amount you



May: Extend watering basins for summer irrigations.

were watering last winter. For more specific amounts, see the chart on page 32.

Apply organic mulches beneath the root areas of citrus, roses and perennials while temperatures are moderate enough to allow work in the garden.

Winter and spring annuals have faded, while many perennials such as coreopsis, gaillardia and rudbeckia are developing vigorously and just beginning their color season.

Clean up dead leaves and faded flower stalks on daylilies. You can remove spent yucca and aloe flower stalks once they are past bloom, but some gardeners leave them for the interest they provide when dried.

Apply acid fertilizer to azaleas, camellias and gardenias. With watering schedules increasing, observe plants for *chlorosis*—yellowing of leaves. This probably indicates lack of iron. Acidify the soil so plants can absorb iron.

If cold-tender plants were damaged by frost last winter, recovery should be well underway. Now, new growth on live stems should tell you which stems and branches are dead. Prune them to live tissue.

June

Summer has arrived with a vengeance. It is important to maintain a regular irrigation schedule.

Prune to control rampant growth of oleanders, citrus, lantana, bougainvillea and hibiscus. Thin excess interior growth of mesquites. Remove crossing branches of palo verde trees.

Remove Bermudagrass that has invaded planting beds.

Pull it by hand, or spray with a product containing glyphosate. Take action as soon as you notice it; wait too long and it can become difficult to eradicate.



June: water regularly, particularly plants in containers.

Roses, shrubs and young trees benefit from the addition of a 3-inch-thick layer of mulch. It helps keep roots cool and slows evaporation of moisture from the soil.

Palms and cacti transplant most readily in hot weather. When moved early in the warm season, plants recover with good growth, responding to heat and deep irrigations in well-drained soil.

Provide shade to protect sago palms from direct sun.

July

With highs ranging from 105°F to 120°F, it should be no surprise that gardening practically comes to a standstill this month. Any gardening task seems to become a gigantic obstacle during a Coachella Valley summer. Early risers find ways to take care of necessary jobs despite the heat, which is often accompanied by high humidity.

Weeds grow rapidly; regular control is important.

Trim off spent rose blooms that keep trying to flower despite the heat. Provide mulches to help plants survive high temperatures.

Monitor all irrigation systems closely. Failure now without early detection can be a disaster.

Be sure to water trees deeply. Palms, especially, respond to slow, deep irrigation. Soaker hoses are inexpensive and easy to use. Summer heat is also a good time to plant or transplant palms and cacti.

When chlorosis shows on eucalyptus and other trees, treat with soil acidifiers. Ask your nursery for advice on current products.



July: Check plant ties often.

Indoors, with air conditioning, begin planning for the fall, or plan a retrofit to make the garden more water efficient. And there's hope: After July, it is only two months until the fall planting season, and the onset of cooler temperatures!

August

August is a near-repeat of July, only high temperatures seem to extend longer and higher humidity plays more of a role. Rains may or may not appear.

Remove dead basal foliage of perennials. Deadhead (trim or pinch off) spent flowers of coreopsis and rudbeckia.

Trim away dead flowering stems of *Salvia greggii*, autumn sage. This stimulates creation of new flowering stems for the fall and winter season. Likewise, lightly cut back old, tired stems of *Salvia farinacea*, blue salvia, to encourage new basal growth.

Time to make plans for fall planting of annuals and perennials. Order seeds of adapted wildflowers for planting in September and October. If weather is not too hot, prepare fall planting beds by digging organic materials into the top 8 to 10 inches of soil.

Rebuild basins on plants, especially on slopes, to hold in irrigation water. Check drip irrigation systems to see that they are operating correctly.

Continue to control unwanted Bermudagrass. If overseeding your Bermudagrass lawn, hold off on fertilizing—renovation and reseeding is just two months ahead. If not overseeding, then fertilize.

Green algae on the soil surface in the garden indicates



August: Trim *Salvia greggii* for more flowers in fall.



July: Vines need support.

excessive moisture. Check irrigation lines and hose bibs for leaks.

Hold off extensive shearing or pruning for another month. Pruning now may expose formerly shaded stems and foliage to sunburn.

September

The 15th of this month launches the most important planting season of the year. Planting reaches its peak by October 15, when winter and spring annuals such as petunias, snapdragons and pansies are placed in their beds. This narrow window of time allows new plants to develop roots when the soil is warm before the cooler late fall and winter air temperatures slow plant growth. Sow seeds of wildflowers, set out trees, shrubs and perennials from containers. Plant bulbs and bulb cover such as sweet alyssum.

If renovating and reseeding lawn with annual or perennial ryegrass, slow down Bermudagrass growth by reducing irrigation and cease applications of fertilizer.

As part of soil preparation in flower and vegetable beds, add organic mulches and slow-release fertilizers.

If petunias, snapdragons and pansies have been planted continuously in the same soil for a number of years,



September: It's prime time to plant.

apply a fungicide to prevent die-off problems with new plantings. Or plant these annuals in a new location, giving the old bed a rest.

Later in the month, as the path of the sun drops lower to the south, gradually taper off irrigation. However, continue to deep-water trees and shrubs. (See Irrigation Guide, page 32.)

October

This is a month of sunny days, yet it's usually comfortable to work in the garden. Plants are thriving, and planting of most everything continues through the month. However, hold off planting cold-tender tropical and subtropical plants such as citrus until spring, unless you have a microclimate at your home where plants are

protected from wind and cold.

This is the month to turn your home landscape into a showplace. Everything is in your favor. The weather is mild and nurseries are loaded with fresh plants in containers, flats and pots. Well-rooted seedlings adjust readily to transplanting during this season. Moisten soil prior to planting. Water plants in gently after planting and continue to water regularly as they begin to



October: Sow wildflower seed for flowers in spring.

become established. Avoid excessive moisture. Dig down into the soil with a trowel to a depth of 6 inches to make sure moisture penetration is adequate.

Continue to overseed Bermudagrass lawns until mid-October.

October is the best time to sow wildflower seeds, but you can continue up until mid-November. How to establish wildflowers is given on page

129. Water planting beds well before sowing seeds.

November

Continue fall planting if you missed the October period. Plants will establish slower with cooler temperatures.

Apply high-nitrogen fertilizer to ryegrass-seeded lawns to spur health and green color as days shorten and colder nights slow growth.

Bring cold-tender plants in containers under shelter to protect from freezing temperatures.

By November, many perennials such as rudbeckia and gaillardia that flower from summer into fall have completed their bloom cycle. Cut back to basal growth and clean up leaf debris.

Chrysanthemums are in their prime. Cut flowers to use for bouquets. This also helps flowering branches from drooping excessively.

During October, November and into December, Texas rangers are in bloom. This makes it a good time to select plants by flower color by visiting your nursery. More than a dozen selections are now available.

Roses usually enter winter dormancy, although they may continue to bloom until severe frost. Keep soil moist. Wait to prune in late January or early February.

Hold off pruning or thinning citrus until after flowering ceases in spring.

December

This is a great month to take advantage of the delightfully mild winter weather, and tackle those major garden projects. Here's a list of ten things to do in the December garden:

1. Install a drip irrigation system complete with weather-based irrigation controller. It will save water throughout the coming year.

2. Plant perennial and bulb gardens to replace beds of annuals—saving water, money and time spent on maintenance.

3. Develop a wildlife garden in a corner of the yard to attract birds, bees, butterflies and small critters.

4. Grow plants in colorful pots you decorate yourself to give as holiday gifts.

5. If your landscape has drainage problems, create a drainage swale, and if possible, include a retention basin. Or build a simulated creek bed with rocks and boulders to channel and disperse runoff. See page 150.

6. Make a rock garden on a natural-shaped, flowing mound to serve as a landscape feature. Plant nooks and crannies with flowering perennials, ground covers, ornamental grasses and accent plants.



December: Time to do the heavy work, such as installing a dry creek bed for landscape interest and drainage.

7. Reduce

the size of large lawns, especially in front yards. Give the space to water-efficient ground covers.

8. Build a raised bed garden to grow a vegetable or color garden. Incorporate ample amounts of organic matter into the soil to provide your plants with optimum growing conditions.

9. If you have an old garden with woody hedges and overgrown plants, consider giving it a face lift. Remove tired plants and bring new ideas into play with colorful, water-efficient, low-maintenance plants.

10. If there is a large expanse of gravel or other inert ground cover surrounding your home, replace some areas with low-water-use ground covers and shrubs. Plants located at the base of structures cut down on reflected heat and light on the outside of buildings to help reduce cooling costs inside.



Water-Efficient Irrigation



How much and how often do you need to water landscape plants in the Coachella Valley? This is a common question asked by many desert gardeners, particularly by newcomers. Answering this two-part question is complex: Drying winds, soils that drain fast, soils that drain slow, and the wide range of water requirements of the many plants that grow here impact how much and when to water. For example, established natives and desert-adapted plants need much less water than tropical or subtropical shrubs and trees, shallow-rooted annuals, non-native perennials, ground covers and lawns. Other factors play important roles, such as competition for water from the roots of nearby shrubs and trees, age of plants, time of year, and exposure to the sun, including reflected heat from buildings and streets.

Lush tropical plants may require daily watering during the summer and twice weekly during the winter. Even low to moderate water users may need irrigation every other day during the summer, depending on the water-holding capacity of the soil.

Succulent plants, including cacti, do well without regular watering. Established cactus gardens can survive with hand watering from a garden hose two to four times a year, depending on rainfall. Speaking of rainfall, some years no measurable rain falls in the Coachella Valley! Generally, monthly or bimonthly watering through the summer is appreciated by even the most drought-tolerant plants.

The water needs of plants are also dependent on the cultivar of a species, where it was originally native to, and the genetics of the individual plant. Even with these many variables, there are good general guidelines to follow.

Plants and Their Day-to-Day Water Needs

Soil type has a great impact on how much and how often to water plants. And one of the toughest aspects of watering plants properly in the Coachella Valley is that the soils can be extremely variable, even within a single home lot. All cove and dune areas in the valley have soils that are well drained and retain little water. The best water-holding soils exist along the Whitewater Stormwater Channel from Rancho Mirage to Indio, in the lower cove of La

Left: An automatic, programmable irrigation system will save you water, money and time, and can provide plants with the proper amounts of moisture for health and growth.

Above: A drip irrigation system applies water slowly where it is needed most: at the plant's root zone.

Watering Basics

A few practical guidelines will help make watering plants more efficient, while helping them grow successfully.

- ❑ Create furrows or wide basins around plants so water will soak into the root zone.

- ❑ Control weeds frequently. They steal valuable moisture and nutrients that should go to your plants.

- ❑ Use organic mulches to increase retention of moisture in the soil and to keep roots cooler during hot weather. (See *Mulching to Save Water*, page 18.)

- ❑ Apply water in early morning or evening hours during summer for highest water pressure and to minimize loss through evaporation.

- ❑ Install automatic watering systems where possible for regulated applications by drip emitters, bubblers or pop-up sprinklers.

- ❑ Make it a habit to adjust automatic irrigation clocks monthly. Increase or decrease the amount of water applied as water needs change with the seasons.

- ❑ Don't operate sprinklers during windy periods (winds tend to be more prevalent in the afternoon). Winds blow water away from the plants you want to irrigate and cause it to evaporate more rapidly.

- ❑ Light hand sprinkling from a hose on shrubs, trees and vines does little good. Soak the soil deeply at the drip line.

- ❑ The appearance of green algae on the soil surface indicates too much water is being applied. This often occurs in late summer or fall as temperatures cool. Reduce water applied, and check for leaks in irrigation system.

Suggestions for watering different kinds of plants and gardens can be found in the chapter, *Landscapes & Special Gardens*, pages 137 to 151. These include containers, page 143; citrus and other fruits, page 147; and vegetable gardens, page 145.

Quinta, in the Indio and Coachella areas and most of the lower valley. In some areas, soils may actually be poorly drained, and certain plants will not thrive there.

Plant roots absorb water from the soil. Water is carried up to the leaves, drawn as water moves out into the drier outer air through microscopic pores in the leaves. Plants can lose massive amounts of water through their leaves (transpiration). In one study, an 8 foot-high corn plant transpired 150 gallons of water in a single day.

Plants lose most of their water between noon and 4 in the afternoon. Roots absorb water day and night but, on a hot day, transpiration through the leaves may exceed absorption through the roots. If the loss is great, plants show their distress by wilting, but they often recover. If



Plants will tell you when they need water by lack-luster color, and drooping, curling leaves. It is better to water before they reach this stage to avoid major stress.

enough moisture exists in the soil, moisture content in the leaves will return to normal at night. If water loss is too great, it can cause the plant to suffer damage or even cause its death.

Plants start photosynthesis even before the sun breaks over the horizon, so early morning is the best time of day to water them. Watering early or late at night also gets water into the soil without undue loss through evaporation due to higher, midday temperatures.

Watering in early morning or late evening also has the added benefit of higher water pressure. The greatest demand on public water systems is between 8 a.m. and 8 p.m. Sprinklers work at peak efficiency when water demand is at its lowest—later in the evening or early morning. For plants susceptible to mildew, such as roses and lawns, morning watering is best: Leaves become dry before nightfall.

Deep soaking trees, shrubs, palms and vines, young or old, helps them develop deep root systems. Deeper, wider, more extensive roots will have access to reservoirs of moisture in the soil. Access to this moisture is important during extended hot or dry conditions, which place extra demand on the plants.

Water should be applied at the plant's *drip line*. This is an imaginary area located at the outer perimeter of the plant. Picture where rain would naturally drip off of

the leaves to the ground. It is here that the plant has its water-absorbing roots, or feeder roots. Near the trunk, you want to encourage development of strong anchoring roots. Watering deep and wide has an added benefit. Trees and shrubs with an extensive root system are not as easily blown over by strong, gusty winds.

To meet the needs of the plants and to save on water bills, water should be applied to the soil slowly so that it can soak in deeply. As mentioned, this encourages deep rooting, with roots well below the hot surface soil. A drip irrigation system on an automatic timer becomes a valuable tool to making this irrigation program come to life.

Using Technology to Tell How Much and When to Water

Computer technology applied to current local weather conditions is available to help the home gardener irrigate precisely, replacing plant moisture loss.

Developed and operated by the California Department of Water Resources primarily for agricultural irrigation, the *California Irrigation Management Information System* (CIMIS) is especially helpful to provide information on lawn irrigation. A home computer is not necessary, although it could make the information more useful.

Evapotranspiration (ET)

A computer in Sacramento regularly polls more than 100 automatic weather stations throughout the state, including the Coachella Valley. It records local weather data such as temperature, relative humidity, dew point, wind speed, soil temperature, rainfall and net radiation. The computer stores the accumulated data and calculates hourly a reference figure for the total amount of water a plant needs to maintain itself. This evapotranspiration (ET) rate varies by plant type.

A quick definition: Evapotranspiration is a process where plants open their pores and thus transpire water. The transpired water evaporates, which helps cool the plant. The evaporation action also physically helps pull more water into the leaves. The plant must open its pores to get the carbon dioxide it needs to make its food.

Precise figures for many landscape plants have not yet been calculated, but the reference ET, or ET^o , provides a good starting point.

If the daily reference ET is known, calculate the daily irrigation need. You can then program irrigation system automatic controllers to deliver that amount.

Moisture stress—replacing less moisture than ET losses—can cause plants to temporarily stop growing. By irrigating established plants at 80 percent of ET, the homeowner can mow and prune less frequently without injuring plants. They will grow about 50 percent less

rapidly. Irrigating at less than 80 percent will cause plants described in this book as high-water users to weaken and decline, becoming more susceptible to disease and pests.

Fruit trees and vegetable gardens should always be irrigated at 100 percent of the ET rate. Less than 100 percent and the quality and quantity of vegetables and fruit harvested will be greatly diminished.

CIMIS Computer

CIMIS information can be accessed on to the Coachella Valley Water District website at www.cvwd.org. Even without computer access, the National Weather Service makes the information accessible by announcing local ET information every day on KIG 78, the Coachella Valley weather radio station (162.4 MHz). Inexpensive radios that receive only the weather station are also available in electronics stores. If you do not have a weather radio or internet access, you can call to hear the CVWD's taped weather forecast at (760) 398-7211, or (760) 345-3711.

Designing a Water-Efficient Irrigation System



A CIMIS station gathers local weather information and sends it to Sacramento for analysis. This information is then distributed to local irrigators.

Irrigation systems are available for every type of landscape. A drip irrigation system is best for areas that contain shrubs and trees. An automatic pop-up sprinkler system is a must for efficient lawn watering. Extensive beds of flowers or ground covers as well as vegetable gardens can be watered by drip emitters or bubblers. An automatic timer regulating the irrigation system(s) is optimal for savings and convenience. Gardeners and plants greatly benefit from automated irrigation systems.

Overall, drip irrigation is considered the best system for most sections of the landscape. It slowly and precisely places water in the root zone on a regular basis to encourage proper growth and healthy plants. Only the root zone is irrigated, and little water is wasted on open spaces between plants. This reduces water loss to evaporation by as much as 60 percent. As an added bonus, the home gardener's maintenance workload is reduced simply because there is less moist soil surface to sprout weeds.

Get in the Zone

The first step in designing your own irrigation system is to evaluate your landscape. Draw a map of your lot, including existing plants. Graph paper, with one square equaling a unit of measurement, works well. Make several copies of this master layout. On one copy, draw in plants you want to add to the landscape. If you have an existing irrigation system, draw that on your map as well.

Next, define separate watering zones. Each zone should consist of plants with similar water requirements, from low to very high. Irrigation zones are based on how often the plants need to be watered, as well as typical soil depth for their roots. Actual gallon amounts applied is not a concern at this stage.

The average automatic irrigation control “timer” has space for six zones, which is usually more than enough for the average home landscape.

Typically, Zone One includes trees and large shrubs that need infrequent, yet slow, deep irrigation. Zone Two usually includes small shrubs, perennials, vines and other plants that need regular irrigation. Zone Three and Zone Four could be for a vegetable garden or lawn—areas watered every day in summer. Zone Five could be for plants in containers on the patio, which require irrigation every day via a drip system. Zone Six may be ground cover or flowerbeds, irrigated with bubblers or multihead “spider head” drip irrigation.

Irrigation System Components

As you begin to plan (and then install) an irrigation system, it's helpful to learn some terminology. Next, you will need to walk through the steps required to install the components to see how they fit together. Last, you will

have to go back to the zoned lot plan you created to figure out which and how many water delivery devices you will need to install for the different plant zones or gardens you have on site.

Before you start installing your irrigation system, it's a good idea to become familiar with irrigation terms. This is true even if you will have an irrigation professional do the installation for you. This knowledge will help insure that the work performed meets your needs and is installed properly.

Stores that specialize in irrigation supplies can offer valuable assistance to the do-it-yourselfer. Most are willing to provide expert advice, and they carry a wide range of the specialty parts you'll require. Because they are in business for professionals, they carry quality equipment that is standardized and interchangeable.

Home-improvement and hardware stores usually do not offer the same quality of service or variety of parts as specialty stores. They sell prepackaged systems with detailed written instructions. It is wise to purchase well-known brands. Often the equipment of unknown brands is substandard. Additionally, components of an economy brand often cannot be interchanged with those of other manufacturers. Once a system is installed, it is important to have a dependable source of parts for replacement and expansion.

Even professionals have to visit the irrigation supply store more than once during the installation of a major project. They often run out of this or that fitting. Do not be embarrassed by multiple trips to the store. Ideally, if you plan properly you'll have more than enough of all you need. Likewise, don't be shy about overbuying and then returning excess. Keep in mind, too, that it's helpful to have a few extras of everything on hand for future maintenance and repairs.

Components and Terms

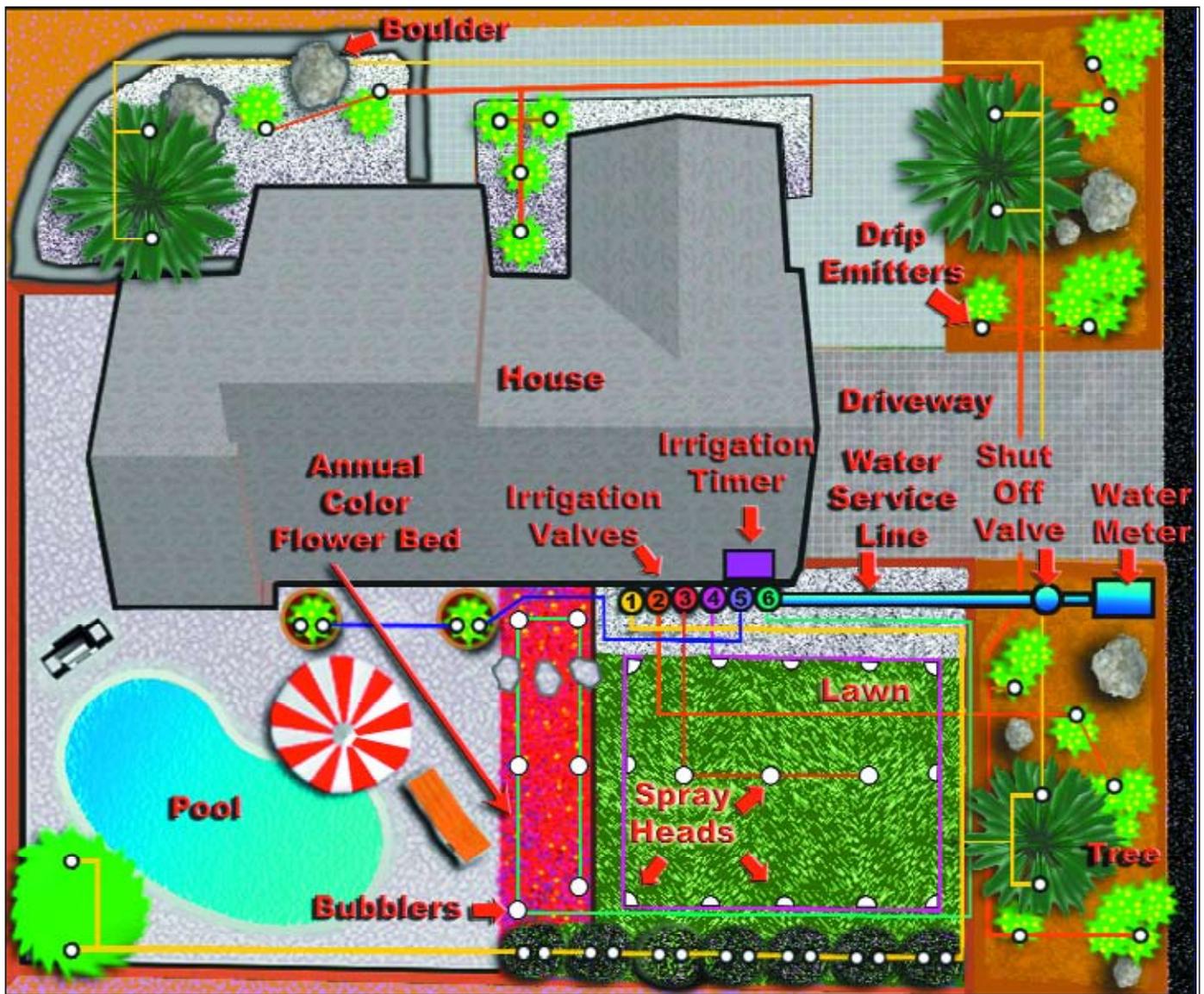
The following terms are loosely grouped by the type of service they perform. As mentioned, become familiar with as many of these terms as possible.

Zone—Group of sprinklers that operate together and are controlled by the same control valve. Also called a *station*.

Pipe—Polyethylene tubing and PVC (polyvinyl chloride) are the two most commonly used types of irrigation pipe. Both types include UV resistant compounds, and both can last up to 20 years.

Pipe comes in various diameters. As a general rule, homeowners should install irrigation lines that are 1/2-inch diameter. Hose bibs are generally made of 1/2-inch pipe, although water typically comes into the home in 3/4-inch pipe.

PVC is a rigid pipe generally used for commercial appli-



Overhead view of an efficient, zoned irrigation system layout. For more information, see *Get in the Zone*, left.

cations and lawn systems. Pipes are cut with a saw and linked using fittings and a special glue.

Polyethylene is a soft, flexible pipe or tubing, most commonly used for drip systems. Once only available in black, it is now available in a variety of colors, which makes it easy to identify which tubing is delivering water to different zones.

Polyethylene can be cut with pruning shears or a polyethylene cutting tool. Sections are then linked with compression fittings or compression couplings that are simple to press into place.

Fittings—Pieces of pipe are connected with various fittings. Common fittings include 45- and 90-degree elbows, “T” connectors and straight connectors (to connect two pieces of pipe). Special adapters are available that link different types of pipe, such as PVC pipe with polyethylene pipe, which happens on occasion.

Microtubing—Used in drip irrigation, this narrow diameter tubing delivers water from polyethylene pipe to the drip emitters. It is attached to polyethylene pipe with barbed connectors.

Holes for the microtube connectors are punched using a specialized punch tool that is purchased when you buy your other supplies. Purchase a number of “goof-plugs” at the same time. Use them to close any holes made in the wrong spot on the polyethylene pipe, or to plug microtubes that are no longer in use.

Water Delivery Devices—Lawns are irrigated with sprinklers. Trees, shrubs and other plants can be irrigated with drip emitters or bubblers. Sprayers and misters can also be part of an irrigation system in special situations.

Drip Emitter—In a drip irrigation system, an *emitter*; also called a *dripper*; slowly releases the water. Available in *button* or *flag* devices, some of the newer, self-cleaning

Irrigation Guide for Trees, Shrubs and Ground Covers in the Coachella Valley

Trees & Shrubs	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
*High	45	56	53	59	60	59	59	57	63	52	44	42
*Med.	31	35	33	38	39	38	38	37	41	33	28	28
*Low	14	21	16	17	18	18	18	17	18	16	14	14

Gallons per day for established trees and large shrubs (15 to 20 feet high and as wide)

Ground covers	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
*High	2.4	2.8	2.8	3.1	3.0	3.1	3.1	3.0	3.2	2.8	2.3	2.1
*Med.	1.8	1.9	1.8	2.0	2.0	2.0	2.0	2.1	1	1.8	1.6	1.4
*Low	.7	.9	.9	1.0	.9	.9	.9	.9	1.0	.9	.7	.7

Gallons per day for small shrubs and ground covers

Irrigation Days per Week

2	3	4	5	6	7	7	6	5	4	3	2
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*Plants are categorized as high, medium or low water use in *Success with Desert Plants*. See pages 42 to 135.

To calculate how long to water with a drip system, divide the gallonage ratings of your emitters into the gallons per irrigation day times 60 minutes. For example, a 1-gallon emitter on a plant requiring 8 gallons per cycle: multiply 8x60 divided by 1 for a required irrigation time of 480 minutes, or 8 hours. Large trees naturally require more and larger emitters. Four 2-gallon emitters would apply the same amount of water in one hour as a single 1-gallon emitter in 8 hours.

flags are a worthwhile option in areas with hard water (See Maintaining and Troubleshooting your Irrigation System, page 38.)

Emitters are rated by the gallons per hour (GPH) of water that they deliver. Select emitters that deliver an appropriate GPH depending on your plant needs and soil type. (See chart above.) In sandy soil, it's helpful to release water for shorter but more frequent periods. Clay soils do not drain rapidly so can accept lower GPH emitters but with longer running times. Note: It is possible to mix emitters with different GPH on a single zone line.

Non-Compensating Emitters—These emitters have a set flow rate at a given pressure and are used on level ground.

Compensating Emitters—Use where there are elevation extremes of more than 10 feet. They produce a nearly constant flow rate regardless of changes in water line pressure.

In-Line Drippers—A type of drip emitter that is placed in a long continuous line of microtube. Useful in vegetable gardens, flowerbeds or for ground covers. These slowly emit water to soil around plant roots, and use less water than bubblers or sprinklers.

Multi-Head—Part of a drip system that allows 6, 8 or

12 lines of microtubing to come out of a single, central location. Used in planting beds or with ground covers. Also called an *octopus* or *spider-head*.

Bubblers—Water bubbles downward, rather than sprinkling. Use to water planter beds by slowly flooding the bed, or place them near individual plants according to the plant's gallons-per-minute requirement. Often used to water trees that prefer flood irrigation, such as citrus. Also rated in gallons per hour, and available as adjustable or non-adjustable.

Adjustable Bubbler—Higher quality devices require a tool to set or adjust the flow (generally a Phillips head screwdriver). Check for a wide range of flow adjustments, debris filters and set flow adjustments that hold.

Nonadjustable Bubbler—More tamper resistant than adjustable types. Check for availability of several flow models, pressure compensation and debris screens.

Microspray Head—Emits water in a spray diameter around the head. These were once popular for ground cover beds. However, they have proven to be inefficient, with a large percentage of water applied lost to evaporation. For a more modern irrigation system that is more efficient, replace microsprayers with multi-heads and drip emitters or bubblers.

Mister—A type of emitter that sends out a mist of water. Used especially in greenhouses that need to maintain high humidity, or occasionally on patios for plants that require high humidity.

Porous Hose—Also called *soaker hose*. These hoses can be attached to irrigation pipe via a fitting called a *hose adapter*. Porous hose allows water to ooze through a series of minute channels in the hose along its entire surface. The soil is thus watered the entire length of the hose and to a width that depends on soil type and amount of time irrigated. It is a good option for vegetable gardens and flowerbeds.

Irrigation Tape—Used in commercial agriculture, and can be used in home vegetable gardens. It is a specially constructed, thin-walled drip pipe that has holes placed every few inches to discharge water. Lay down an irrigation tape for each row of planting. Install on the soil surface or bury one or two inches deep.

Sprinklers—A wide range of types are available, with a variety of techniques used to disperse water through the air to the targeted garden location. A great percentage of water applied can be lost to evaporation by using sprinklers.

Pop-Up Sprinkler—Irrigation device that will pop up out of an underground housing to water an area, then descend into the housing once watering is over. Sprinkler heads with plastic components and with pop-down springs are currently popular but have a shorter life expectancy than the older style constructed of brass or other metal.

A pop-up height of 3 to 4 inches is ideal for lawn. Check

for debris screens to reduce clogging. Heads are available in several nozzle patterns and radii (color-coded ones are preferred). These provide coverage to small irregular areas. Low-angle nozzles are recommended for windy locations.

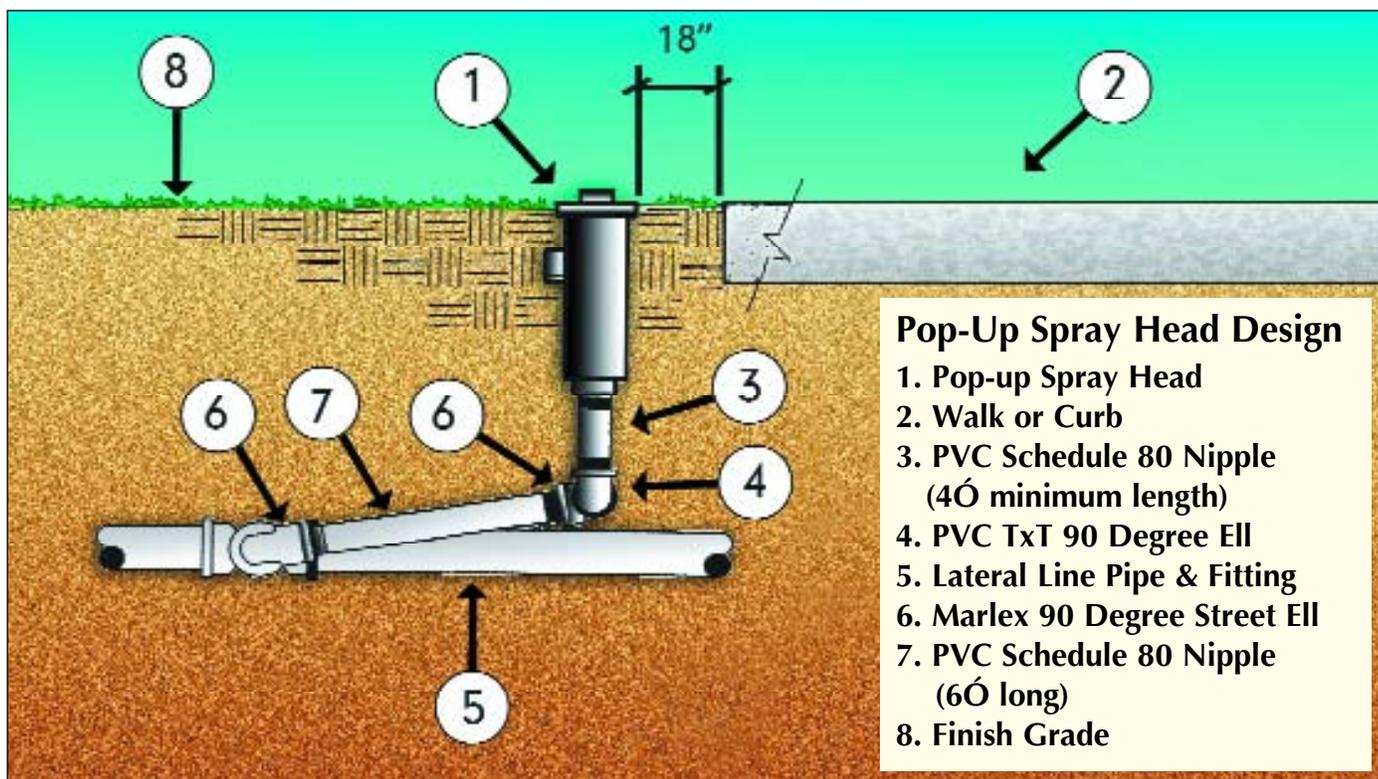
Pop-Up Rotor—A form of pop-up sprinkler that will cast the water in a rotating circle. It can be set to sprinkle in a 360-degree circle, or as little as a 90-degree arc.

End Cap—Every irrigation zone (line) requires an individual end cap. By removing this cap, you can clean the line out after installing the system—before first use. Clean out all the dirt, sand and debris in the line that can clog emitters or sprinklers. End caps should also be opened periodically so lines can be flushed clean.

Backflow Preventer—A device that prevents the water in the irrigation system from siphoning back into drinking water. In some regions, ordinances require installation of backflow preventers. Also called *anti-siphon valve*.

Filter—All irrigation systems need some type of filter to keep dirt and debris from clogging the emitters. Look for one that comes apart easily for its quarterly cleaning. Some stores sell fertilizer tablets that can be placed inside the filter. Do not use these because they lead to salt build-up and clog the drip emitters.

Emergency Shut Off—Necessary to allow you to shut off water to the irrigation system in case of an emergency. It is recommended the irrigation system be installed on a separate water line stubbed off of the main water line that goes into your home.



Shut-Off Valves—These can be either a *gate valve*, which functions like a water faucet, or a *ball valve*, which rotates 90 degrees to close a ball inside the pipe. Ball valves are preferred, and are less likely to break down or freeze up over time.

Pressure Regulator—A device that maintains steady water pressure within your lines. One must be installed in each zone. Pressure regulators insure that surges in water pressure do not rupture lines or blow emitters off the tubing. Pressure regulators are rated by the pounds per square inch (PSI) of water pressure they permit. Generally a 20 PSI regulator is ideal for a home landscape. Depending on the type of lawn sprinklers you use, you may need a higher PSI. Also if you need to apply water up a slope from where your valves are located, you may need a higher PSI, as well as pressure-compensating emitters.

Pressure Gauge—Used in commercial applications, and not generally required by the homeowner. Water in desert regions often contains minerals or salts that can build up over time. A pressure gauge, installed downstream from both the filter and pressure regulator, lets you know when it's time to clean the filter. Regular quarterly (every three months) cleaning of the filter and flushing lines eliminates the need for this device.

Automatic Controller—Functions to control the watering cycle by sending a signal to the control valve(s) to open or close on the days and times you pre-select. You program the controller and direct it when, how long and how often to water plants. For outdoor installation, check for a gas-

ket-sealed door and a sturdy case that can be locked. Also called a *timer*.

Weather-based controllers adjust automatically according to weather conditions, eliminating the need for the homeowner to adjust water output each month.

Features to check for: A battery or other backup to retain the irrigation program during power failure; two to three start times per program per day; up to 6 hours run time per zone; 21-day calendar or programmable day intervals and rainy day shutoff. Another desirable feature is remote access by modem or radio, programmable to use ET data from CIMIS. See page 29.

Electro-mechanical Controller—An older style controller that runs only one zone (valve). Generally uses “pins” to trigger start and stop times. Irrigation supply stores usually have pins available.

Features to check for: Minimum 3-minute cycle for spray heads; maximum 6-hour cycle for drip; 21-day calendar.

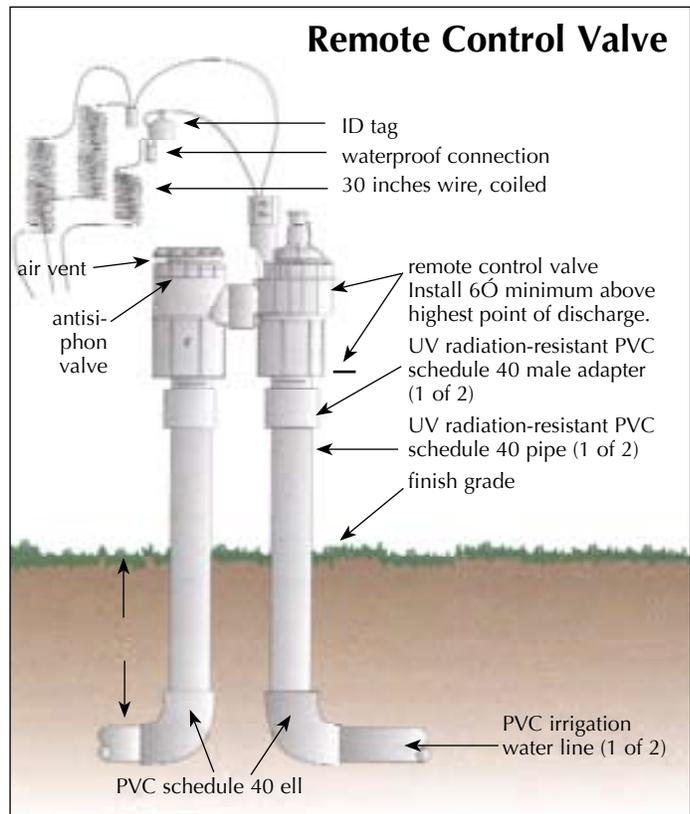
Valves—Valves can be automatic or manual. One option is to have manually operated valves for each zone. You simply turn the valve on when plants in that zone need water. Also called *control valve*. If you convert to low-water-use plants throughout your landscape, a manual valve is an inexpensive option. This is because many desert-adapted plants need only a periodic deep soak once every three weeks or so in summer. Many require no water once (they are established) in winter.

Valves are generally made of durable plastic. For com-

Daily Irrigation Schedule for Turfgrass in Minutes per Day

This chart shows the average number of minutes a grass lawn typically needs water each day. Watering times can vary significantly based on sprinkler efficiency and soil conditions. Reduce watering times gradually to determine the proper amount needed for your lawn.

MONTH	SPRAY HEADS	ROTARY HEADS
January	4	9
February	6	15
March	9	21
April	12	27
May	15	33
June	17	38
July	16	38
August	15	33
September	12	28
October	9	19
November	5	13
December	4	7



mercial applications, brass is more expensive but recommended. Also, brass is preferred if valves will not be sheltered in a housing. (See below.)

Automatic Valves—These are electrically operated by the controller. The low-voltage electricity comes from the controller into a solenoid on the valve that “tells” the valve to open or close. Purchase valves with a back-up manual option. This allows you to operate the valve even if the controller or solenoid are not functioning.

Features to check for: Emergency shut-off; manual override; replaceable solenoid assembly.

Valve Housing—Valves are generally placed in protective housings, which can be either above or below ground. It is best to decide which works best for you and your landscape before you visit the store. Underground housings have a much nicer appearance and are much less obtrusive, yet access to valves makes it more difficult to work on them in case of malfunction. Valve housings were once available only in green. They come in other colors that blend better in the landscape, including a desert tan.

Atmospheric Breaker Valve—A type of valve required in landscapes that include lawn. Allows the water to bleed back out of the line and allows the pop-up sprinklers used to irrigate the lawn to drop back down into their housings. Once these were the only type of valves available, and depending on the store, may still be the only type. The atmospheric breaker capability is not required for drip lines.

Manifold—Term used to cover a number of valves placed near one another, possibly because the entire apparatus appears similar to the exhaust manifold of an automobile engine. Also called *valve manifold*.

Mainline—Water line from water source to the valve assembly. A mainline is usually PVC pipe.

Zoneline—Water line from the valve assembly and extending around a particular zone. Generally, PVC pipe is used for lawn zones and polyethylene pipe is used for all other irrigation zones.

Installing Your Irrigation System

At last, you have decided on your irrigation zones. Now you need to decide where you (or your contractor) will install the controllers and valves. If you are interviewing contractors and they do not fully understand the following questions, consider finding another contractor who does understand.

- Where is the water source most easily accessible, yet the irrigation system will be unobtrusive?*
- What is the pipe size at that point?*
- Where is the electric power source for any automatic controller?*
- Where is the most easily accessible yet unobtrusive site for automatic controller and the control valves?*

Before going to purchase your equipment, make a list



Installed and operated correctly, an automatic sprinkler system is the ideal way to irrigate lawns.

of the required supplies. If your irrigation plan is neatly drawn to scale, the irrigation equipment supplier should be willing to help compile a list of what you'll need, along with an estimated price.

The hardest part of installing an irrigation system is the physical digging of holes where all the pipes and valves will go. Start with the mainline. The mainline leads from the water source to a location where you will be placing your valves. As mentioned, the mainline is generally constructed of PVC pipe rather than polyethylene because it is more resistant to pressure changes. As you leave the water source and begin the mainline, install the emergency shut-off and the backflow preventer. You can also install a single filter for the whole system at this point.

Depending on your design, you may have a short or long mainline. You may even have several mainlines to different zones. Keep in mind that if you use an automatic controller, you will also need to run the control wires to the automatic valves.

Once your mainline trench is dug to where your zone control valves will be located, lay in the mainline. Next, install the valves and all the associated devices you will need for each zone line. This is occasionally referred to as the *valve assembly*.

Each zone will need a filter if you have not already installed one. Next step is to install the control valve. The control valve can be automatic or manual. If automatic, it is linked by a low voltage wire to the automatic controller.

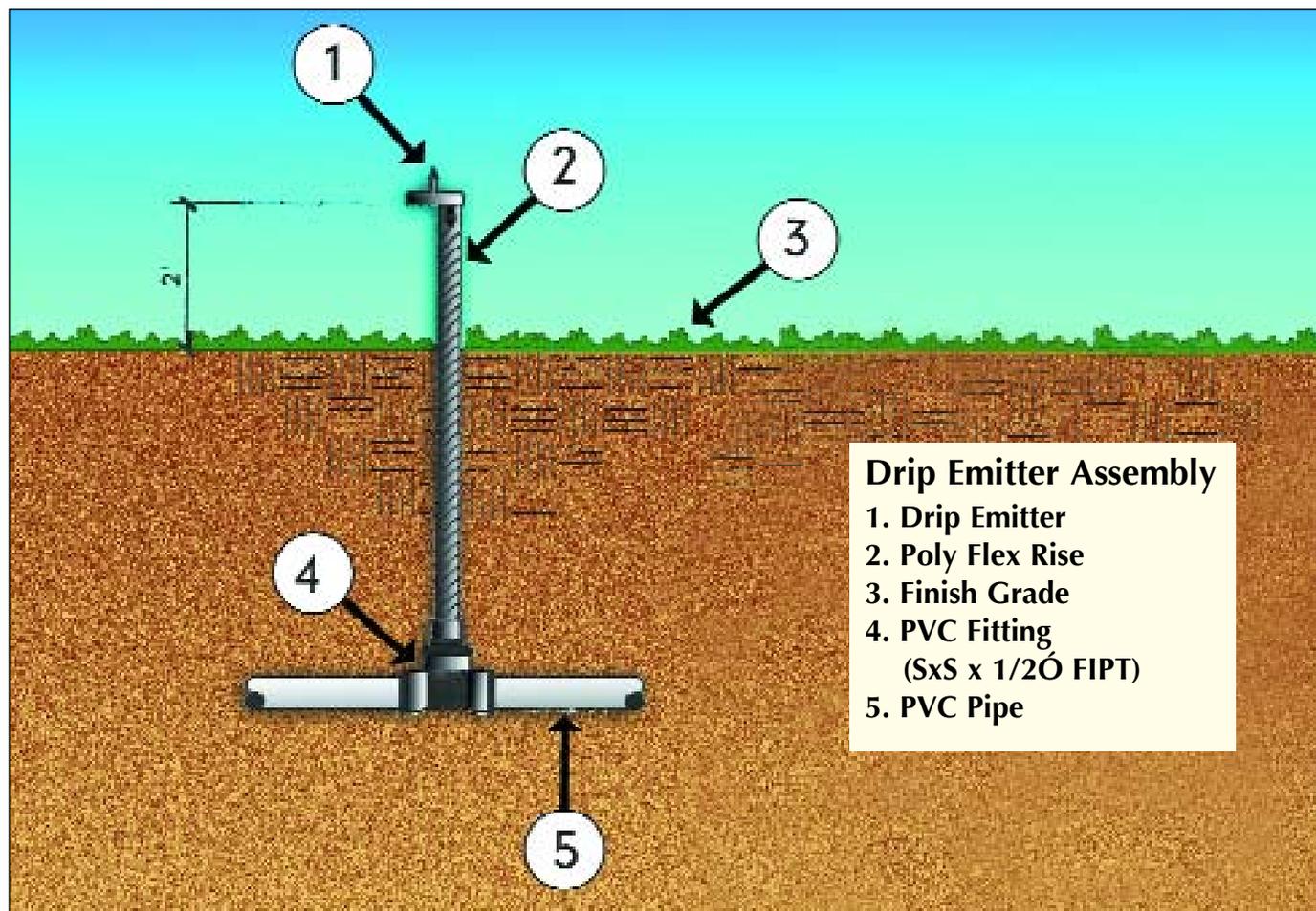
Immediately after the control valve, install a pressure regulator. As an option, you can install a pressure gauge after the regulator.

If your zoned lines are constructed of polyethylene, you must install an adapter that links the pressure regulator to the zoned line. This device permits easy disconnect for any necessary repairs.

Now that your valve assembly is complete, you can begin to run the zone lines to where they are needed.

Microirrigation (Drip) Systems

Professional-quality landscape microirrigation equipment was developed initially for agricultural use. Coachella Valley farmers have been among the world leaders in developing and using microirrigation techniques. Homeowners in the Coachella Valley benefit by having easy access to several irrigation speciality stores. These stores are excellent sources for equipment, as well as advice. Irrigation professionals are available to suggest problem-solving



steps and provide expert guidance.

For commercial applications, irrigation systems must be strongly constructed, resistant to vandals, hidden from view, locked, and must operate with a minimum of supervision. Home systems need not be so heavily constructed. For optimal, long-term survival of any irrigation system, quarterly maintenance is necessary. This maintenance schedule is easy to remember. Often, it is performed at the same time when automatic timers are adjusted for the change in water need as the seasons and temperatures change.

Installation Tips

Polyethylene pipe will have compression fittings that grip the pipe from the outside. They can be admittedly difficult to compress into place. Never use lubricant to install the compression fittings! If necessary, you may warm the polyethylene pipe in hot sun or with a heat gun or hair dryer to make the fittings easier to install.

The older style “insert fittings” should not be used. They grip the hose on the inside and can come loose and leak with fluctuating pressure or summer heat.

Zone line should be run around the outside perimeter of all the plants served by that zone. From the polyethylene

pipe to the plants, you will then install microtube(s). A drip emitter is placed at the end of each piece of microtube. The microtube is connected to the polyethylene pipe with a barbed connector.

Make a hole in the zone line for this connection using a *punch*, a special tool available where you purchased the irrigation supplies. You can cut a hole with a knife or ice-pick, but if the hole is too large it will leak. If you have a leak, your only option is to cut out that section of hose and replace it with another section, connecting the replacement pipe with compression fittings.

Standard installation will have at least one emitter at each plant. Trees will have three or more emitters, depending on size and water requirements. The goal should be to moisten at least 50 percent of the soil volume within the plant’s drip line.

A plant’s *drip line* is not the same as an irrigation drip line. The plant drip line marks an imaginary area around the outer perimeter of the plant where rain would drip off of the leaves. It is here that the plant’s *feeder roots*, which absorb water and nutrients, are located.

For healthy trees and shrubs that will resist being blown over by the wind, encourage wide rooting by placing emitters at the plant’s drip line. Because plants are continuously



It’s best to irrigate plants such as ground covers so that water is applied above the foliage, allowing coverage to be more uniform over the planting area. This microbubbler is elevated to provide an even application of water.

growing and increasing in size, you will need to periodically adjust the location of the drip emitters, as well as add more emitters.

With a zone line well away from the base of your large plants and with long microtubes, it is simple to move emitters as plants grow. Planning for future growth is important.

Luckily, you can connect microtubing to the polyethylene pipe as many times as you want. Because drip emitters release water slowly, decreased water flow is not an issue. The only issue is that the length of each microtube should be less than 10 to 12 feet.

Frequency of watering will depend on soil type and weather conditions. See *Plants and Their Day-to-Day Water Needs*, pages 27 to 29.

Drip emitters usually come in 0.5, 1 or 2 gallons or more per hour (GPH) sizes. The variety of plant sizes, water needs, soil types and growing conditions can make selecting emitter sizes confusing. Plants growing beneath trees or in the shade of a structure will need less water than for the same plant species in an exposed location. However, many plants that prefer shade are actually very high water users, and may even require more water than the trees providing the shade.

Because of the big difference in the comparative water

requirements of small shrubs and large trees, they should be placed on separate zones (valve circuits). Mid-sized plants generally can share any zone available, by adjusting the number and size in GPH of the emitters that provide their water.

Emitter size and placement also depends on soil type. Sandy soils drain so rapidly that water moves very little horizontally (from side to side) in the soil. Emitters must be spaced closer together in sandy soils to provide sufficient coverage of the root zone. If the area isn't windy, microspray heads may be more efficient than drip heads in such soils.

Fine-textured (clay) soils allow drip emitters to soak wider areas, reducing the number of emitters needed. However, water spreads slowly downward through clay soils, so delivery time should be increased.

On slopes, place emitters uphill 12 to 18 inches from the drip line of the plant. This way water flows down toward the plant to provide more adequate coverage.

Often, many different plant types are planted close together in a home landscape. Some need more moisture than their neighbors. Drip emitters with different flow rates can be used at the same operating pressure to meet individual plant needs. Multiple outlet emitters also can be installed to apply more water to large trees or shrubs.



When including lawn in your landscape, try to keep the design simple. This will make it easier to water, mow and trim edges efficiently.

Emitter example: Two shrubs of similar size are planted on the same zone. Shrub A is a high-water user. It gets 5 emitters that flow 1 GPH. Shrub B is a low-water user. It gets 3 emitters that flow at 1/2 GPH. The system operates for 6 hours once a week. Shrub A (high water) has 30 gallons to sustain it for the coming week. Shrub B (low water) has 9 gallons to sustain it.

Keep in mind that this example is for established plants, not newly planted ones. Also note that all plants in the same zone (the same station) will be irrigated for the same amount of time.

Specialized Irrigation Systems

Vegetable Gardens—A vegetable garden should be on its own irrigation zone. Drip irrigation is an option, but specialty devices such as in-line drippers, multi-heads, porous hose or irrigation tape can also be used. Check your garden daily when the system is first installed to be certain plants are receiving adequate moisture. Once the summer garden is established, watering may be required only two to three times per week, depending on soil type and the garden's exposure.

Flowerbeds—Drip irrigation for special situations such as flowerbeds can be challenging. This is where specialty drip devices are of value, much the same as with vegetable gardens. Look to in-line drippers, multi-heads, porous hose, irrigation tape or bubblers to supply the varied water application needs of these plants.

Ground Covers—If a desert-adapted ground cover is used, irrigation is simple. Due to low water needs, well spaced drip emitters will be ample as long as the run time evenly moistens the soil covered by the ground cover.

If high-water use plants are installed, the homeowner may opt to use specialty devices such as in-line drippers, multi-heads, porous hose, irrigation tape or bubblers.

Irrigating a Grass Lawn—A grass lawn should be on its own zone. The control valve must be an atmospheric breaker valve. The pipe for the entire zone should be rigid PVC pipe.

An irrigation system that sprinkles water from overhead is usually the right choice for lawn irrigation. Depending on the size and shape of the lawn, install either pop-up sprinklers or pop-up rotors.

Plan your system so the entire surface of the lawn is watered without overspraying any areas, or leaving areas dry. Avoid overspray on buildings or fences, which can cause extensive damage over time. Also avoid spraying surrounding landscape plants where fungal diseases or water spotting will become a problem.

When the weather turns cool, homeowners often neglect watering Bermudagrass lawns. Never allow them to become bone dry, even if they are not overseeded. If winter rains

are absent, irrigate at least once or twice a month. Doing so will allow the lawn to recover more promptly in spring.

Retrofitting an Irrigation System

Retrofitting an irrigation system usually occurs when homeowners move from lawn sprinklers or bubblers to drip irrigation. Most of the time, existing PVC piping can be utilized for the new system.

Check operation of existing valves. These valves may need to be replaced with smaller valves designed for reduced flows.

Drippers may be installed on existing PVC piping and irrigation-head risers by using a multi-head fitting. This allows you to connect 6, 8, or 12 lines of microtubing (with drip emitters on each microtube) from a single location cut into the PVC. If connecting multiheads to existing PVC is not an option in your landscape, you'll have to install new polyethylene zone lines.

Polyethylene pipe can be attached to PVC pipe with a special compression adapter. Polyethylene can be run from existing valves and placed where necessary to water plants in each zone. For best landscape appearance and longevity of the polyethylene pipe, bury it a few inches below the soil surface.

A drip-irrigation controller must be capable of long cycle watering—from 1 to 6 hours. If it is *electronic*, it is probably adequate for the new system. *Electro-mechanical controllers* usually have 30- to 60-minute maximum run times per zone. If drip irrigation will be installed on an existing electro-mechanical station, it is best to replace it with an electronic weather-based controller.

Maintaining and Troubleshooting Your Irrigation System

When plants wilt or die, the cause may be a malfunction of the irrigation system. Regular maintenance of the system can usually prevent this. When problems occur, rational, systematic troubleshooting techniques can identify problems so you can make repairs.

Maintenance and repairs are easier if you've planned the initial installation carefully. Controller wiring should be arranged so all valves operate in sequence as you walk around the house. Some controllers have an optional test cycle schedule built in, which is typically two to five minute per zone.

Electrical problems can prove to be troublesome. Again, preventing problems with a quality installation is the best policy. Wire connectors at automatic control valves must be properly waterproofed or, better yet, use all UL approved connectors made for direct burial.

Controllers should be on their own circuit breaker to

prevent loss of power if another appliance malfunctions. Heat causes a lot of controller failure. To reduce controller failure caused by heat, position them out of direct sun—especially afternoon sun. Install away from air conditioning units, which produce heat. Replace backup batteries in time clocks at the beginning of each summer.

Checking a Lawn Irrigation System

To find out if water is being applied evenly throughout the lawn area, perform this simple test. First, set several empty coffee cans, tuna cans or other straight-sided containers on the lawn. Place in a grid pattern between sprinklers. Run spray head sprinklers for 15 minutes; run rotor head sprinklers for 30 minutes. After this allotted time, use a ruler to measure and record the depth of water collected in each container. By using containers that are all the same size (with identical surface areas), water volume for separate areas around the lawn can be compared by pouring them into a kitchen measuring cup. If there is a difference of more than 20 percent between maximum and minimum, identify problem spots and adjust sprinkler head flow rates.

Most spray head irrigation systems spaced 12 to 15 feet apart should accumulate about 1/2 inch of water in 15 minutes of operation. Most irrigation systems using larger rotor sprinklers spaced 25 to 40 feet apart will accumulate about 1/4-inch of water in 30 minutes.

The lawn irrigation chart on page 34 is for established Bermudagrass lawns, watered during the cooler hours of the day. If you overseed with winter ryegrass in fall, increase water to meet the germination needs of the rye.

The irrigation chart assumes normal weather conditions and sprinkler uniformity. Irrigation time should be increased when temperatures are above normal or conditions are windy, and decreased during rainy periods.

Preventative Maintenance of Lawn Systems

Operate the test cycle manually from the controller after each mowing to check for damaged or malfunctioning sprinkler heads.

Heads must pop up to clear grass and pop down at the end of the cycle. If they do not, debris is clogging them or there is another problem. Clean and flush the heads.

Look for clogs, rotors not turning, heads tilted out of alignment, or part-circle heads twisted out of horizontal alignment. Also check for head-to-head sprinkler coverage. Each sprinkler should throw water to just reach the area covered by the adjoining sprinkler. If it is coming up short, it could be caused by a major loss of pressure due to a broken head or pipe. This will need immediate repair. A broken sprinkler head can waste at least 500 gallons of water a week and continue to cause other sprinklers on the

system to malfunction.

A "double swing" joint installed on sprinkler heads usually prevents major damage to the installation. The best time to include the joint is when the system is installed. To make a double swing joint, lateral tees and ells are installed at 90 degrees to vertical and two-threaded street ells are installed before installing the sprinkler riser. *Flexible risers* can be installed on existing systems.

Homeowner Alert—Be aware of possible liability problems caused by injuries from improperly placed sprinkler heads. Be sure all heads are below grade of adjacent walkways, but only slightly so.

If lawns slope toward a structure or sprinklers throw water onto a structure, moisture can enter the wall, causing severe damage. Regrade planted areas so water drains away from structures. Replace or redirect errant sprinklers.

Preventative Maintenance of Irrigation Systems

Once per quarter, when you change the controller program to reflect the seasonal change, operate the test cycle. It allows you to see if each valve is coming on and shutting off properly. Run the system long enough to check all water delivery devices.

Start at the beginning of the system with a check of each of the following:

Water Meter—Check the flow routinely when the irrigation system is running. Changes in flow rate will warn of problems. Unusually fast flow is indicative of a leak. An abnormally slow flow indicates clogged filters or emitters. Some high-tech systems use electronic flow meters connected to controllers to automatically shut off a system or valve when the flow rate goes outside preset limits. When this happens, an error message is left for the user.

Emergency Shut-off—Operate this valve to be sure it still works properly. By testing it once per quarter chances are it will not be frozen open when you need it to close.

Filters—Although quarterly cleaning is a must, clean them more often if it is necessary to keep the system flowing without pressure loss.

Controller—Check regularly that the correct time and day of week are displayed.

Controller Program—Check and adjust every couple of weeks during spring and fall and every month or two during summer as needed. Keep pace with changing weather conditions unless a soil-moisture sensor override system or weather-based controller is used.

If the controller is electronic, determine if it is running the personalized program you set it to run, instead of the default program. If the default program is running, check the battery backup system and replace batteries as needed. You will then have to reprogram the controller as well.

Irrigation Schedule—For heavy water users, determine

if at least 80 percent of daily evapotranspiration (ET) requirements are being met. Low-water use plants may require only 40 to 60 percent of daily ET, while lawns in late spring or early summer may be much higher. See irrigation guide for landscape plants, page 31, and irrigation guide for lawns, page 34.

Irrigation Timing—Operate irrigation systems during the coolest time of the day in summer and early enough in the day in winter so plant leaves dry before dark.

Valves—Check for flow. Be sure the optional manual override on automatic valves is not frozen open or shut.

Pressure Gauge or Schrader Test Valve—This optional piece of equipment is set at the end of a micro-irrigation system to diagnose leak or pressure regulator problems.

Drip System Lines—Flush lines quarterly by removing all of the end caps and running the system for about two minutes. Put the end caps in your pocket when you remove them so they won't be washed away by the flow. Likewise, flush lines after breaks are repaired.

Emitters—Check for clogs or lost emitters. Look for any leaks caused by damaged pipe or microtubing.

Bubblers—Check for proper flow and any leaks.

Runoff—During a normal irrigation cycle, check for water runoff. If water is running off, divide application into two or more cycles during the day separated by an hour of “soak-in time.”

Diagnosing Irrigation Problems

Valves fail to operate. This may happen after you tested the system and you forgot to return the automatic control-

ler function switch to the “run” position. Professionals and amateurs alike make this error surprisingly often.

In electronic systems, the second-most common reason the valves do not operate is a program set incorrectly. Examples include when the day is set to “off,” the “skip days” is incorrectly set or the “start time” is set to off.

Valve failure can be caused by loose wires on the valve or controller. Check wire connections and tighten them.

Sometimes the solenoid in the valve becomes defective. Test with a multimeter or volt meter. If it is bad, you may be able to replace the solenoid, or replace the entire valve.

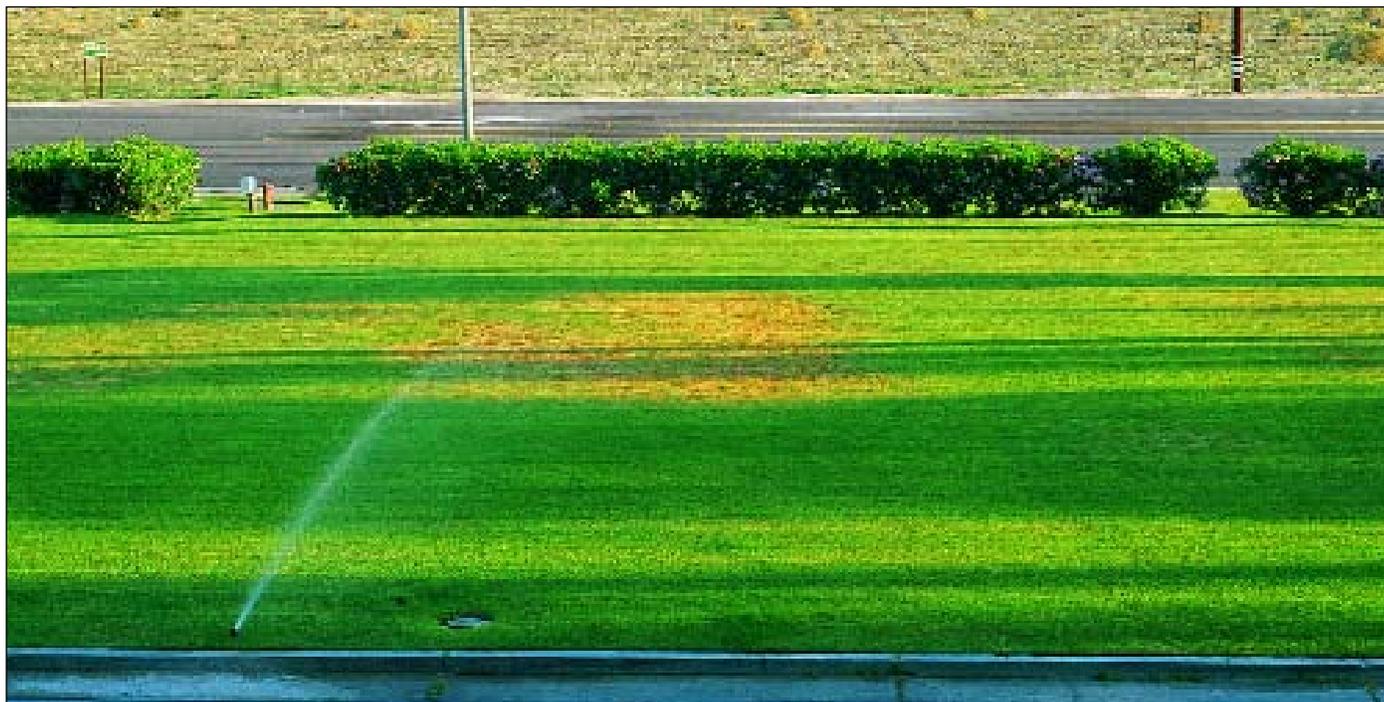
Valves open at the wrong times. This is due to incorrect programming of the automatic controller. It may be as simple as resetting the a.m. and p.m. setting of the clock.

No display on the electronic controller. Power to the controller has been lost. Check the breaker. If it is OK, turn the breaker off and check controller wiring to the house current.

Dry spots between sprinkler heads. Usually the result of a clogged or broken spray head. A broken riser or pipe below the riser can also be the problem, but not as often. Unclog the sprinkler head or repair the break.

Occasionally, dry spots are the result of low water pressure. Dry spots a few feet from rotor heads with green interlinking rings farther out between heads or, in the case of spray heads, green around the head and dry in between, is typical of low pressure. Clean the filter to fix.

Dry spots can be caused by misaligned spray heads. Check to see if they are perpendicular to the surface they are watering.



A single dry spot that suddenly appears in the lawn is probably the result of one sprinkler failing. For example, one rotor head is not turning or there is a clogged nozzle.



Success with Desert Plants



Selecting plants for valley gardens can be a difficult task, because we have so many different species to choose from. Our sunny climate, mild winters and long growing season allow an extremely wide range of landscape plants to grow and thrive.

Gardeners have among their choices “traditional” landscape plants—those that have been grown in the Coachella Valley for decades. Expanses of lawn bordered by hedges and bracketed by skyline palms, brought to life with colorful beds of annuals in the foreground, come to mind. This type of landscape may be visually appealing to many, but they require a tremendous amount of water to establish and maintain.

After years of testing and research by pioneering landscape professionals, nurserymen and growers, a wide selection of new plants that are attractive and colorful, yet use much less water, are now available. Many are native to our region; others come from arid climates around the world. With a thoughtful eye toward design, these plants are gradually changing the face of our region. At the same time, they are greatly reducing the amount of water it takes to keep our landscapes attractive and thriving.

As you look through the following pages, consider these new plants as candidates for your own landscape. In the long term, it is wise for all of us to select plants that are lush as well as water efficient.

The colorful icons shown below help explain at a glance what each plant needs to grow successfully: preferred exposure to the sun, water requirements, plus each plant’s inherent ability to withstand cold. Because conditions are so variable from garden to garden, use these recommendations as a general guide. Note too, that the water recommendations are for *established* plants, which means plants have lived through two summers in our desert climate.

- | | | | |
|---|---------------|---|--|
|  | Reflected Sun |  | High Water. Water every day in summer. |
|  | Full Sun |  | Moderate Water. Water every other day in summer. |
|  | Partial Sun |  | Low Water. Water two to three times per week in summer. |
|  | Shade |  | Cold Hardiness in degrees Fahrenheit |

Left: California poppies partner with an agave for a colorful, low-water combination.

Above: The lush, colorful flowers of *Leucophyllum* ‘Green Cloud’.

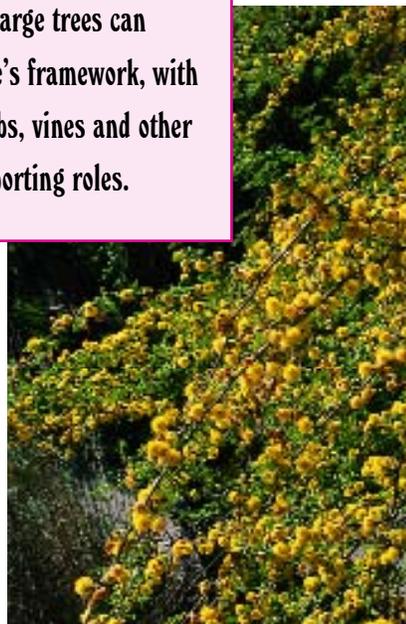
TREES

LUSH & EFFECTIVE



Trees are extremely versatile plants, serving many different landscape functions. They can frame a desirable view, screen unsightly elements, help create privacy and provide a backdrop for a home or other plants.

Trees provide permanent structure to a design, establish the scale of the landscape, give visual proportion to open space, and define the “ceiling” of the space. Several large trees can provide a landscape’s framework, with smaller trees, shrubs, vines and other plants playing supporting roles.



Acacia species

ACACIA

Acacias are native to regions all around the globe. With almost 1,000 species, a wide variety of forms, textures and colors are available, including both evergreen and deciduous plants. Acacias are tolerant of heat and are generally low to moderate water users. Provide trees with deep, infrequent irrigations to help establish root systems. Flowers are individually tiny but are clustered into puffballs or long drooping flowerheads called *catkins*.

Acacia aneura

MULGA



Evergreen and thornless, mulga grows slowly to 20 feet high and 15 to 20 feet wide. Small, narrow, silvery gray leaves are leathery, similar to those of an olive tree, and are dense along the branches. Makes a fine windbreak and screen. Yellow catkins, the flowers, are heaviest during late spring into summer. Native to Australia.



Acacia berlandieri

GUAJILLO



Like many native American acacias, light green leaves are delicate and almost fern-like. Trees grow at a moderate rate from 10 to 15 feet high and 12 feet wide. Fragrant, cream-colored, puffball flowers bloom in tune with spring weather. Plant in well-drained soil. Smallish thorns are usually not a serious hazard. Gradually prune lower branches to develop small tree form. Native to southern Texas and Mexico.

Acacia craspedocarpa

LEATHERLEAF ACACIA

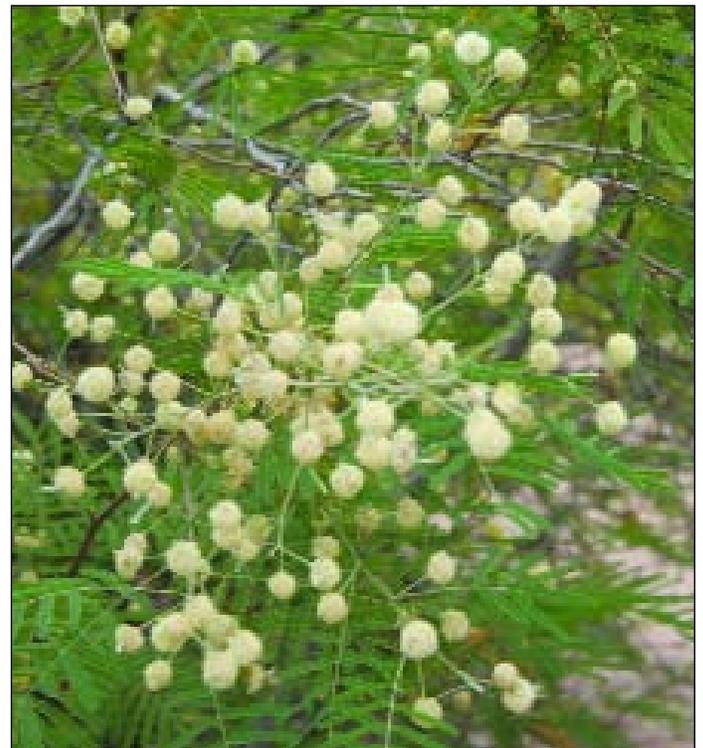
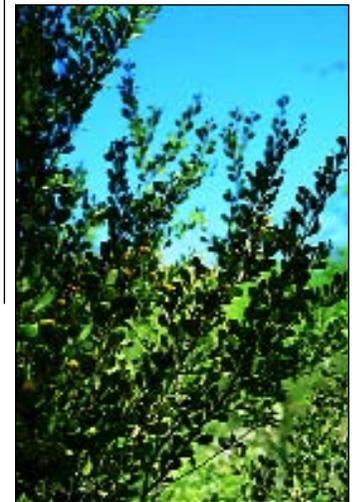


Grows slowly from 10 to 15 feet high and 8 feet wide with a rounded crown. Evergreen with rounded, upright gray-green leaves. Yellow puffball flowers bloom spring to summer. Prune into a tree or leave shrubby as an alternative to oleander, effective as a screen. Native to Australia.

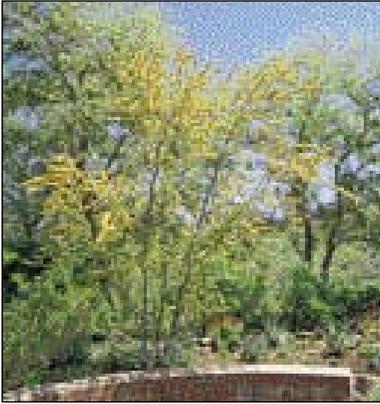
Below: *Acacia craspedocarpa*, leatherleaf acacia.

Below left: *Acacia aneura*, mulga.

Below right: *Acacia berlandieri*, guajillo.



Below: *Acacia rigidula*, blackbrush acacia.
 Below left: *Acacia saligna*, blue leaf wattle.
 Below center: *Acacia salicina*, willow acacia.
 Below right: *Acacia willardiana*, palo blanco.

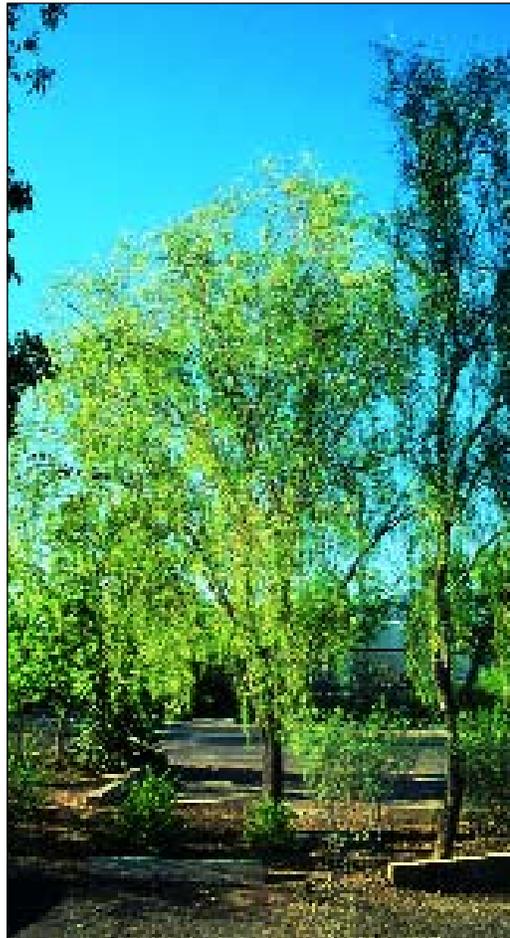


Acacia farnesiana
 SWEET ACACIA   10°
 (*A. smallii*, *A. minuta*). This is a medium, open, multi-trunk tree with vasselike form, fernlike leaves, small thorns, and fragrant flowers. Deciduous to semi-deciduous, grows at a moderate rate from 20 to 25 feet high and as wide. Yellow puffball flowers are profuse in spring and produce a wonderful sweet fragrance. Avoid heavy pruning as it leads to problematic suckers. Native to Mexico.

Acacia rigidula
 BLACKBRUSH ACACIA   15°
 A slow-growing small tree or large shrub reaches 15 feet high and as wide. Tolerates heat and drought, but will also accept moist conditions, such as near lawns. The smooth, gray bark contrasts nicely against glossy green leaves that are cold deciduous. Long catkins of cream-colored flowers bloom in spring. Some plants have thorns. Native to Chihuahuan Desert.

Acacia salicina
 WILLOW ACACIA   20°
 A low-water and enduring alternative to weeping willow, which is short-lived in desert regions. Graceful, pendulous evergreen leaves on trees that grow rapidly from 20 to 40 feet high, spreading 10 to 20 feet wide. Creamy white puffball flowers bloom late summer into winter. Water deeply and well away from the trunk to avoid blow over during windstorms. Native to Australia.

Acacia saligna
 BLUE LEAF WATTLE, WEEPING WATTLE   20°
 Rapid, aggressive, vertical growth with a dense canopy to 20 feet high with an equal spread. Evergreen leaves drape gracefully toward the ground. Yellow puffballs are mildly fragrant, appearing in spring. Native to Australia.



Acacia stenophylla
SHOESTRING ACACIA



Strong, vertical and graceful, rapidly reaching 25 to 30 feet high yet spreading only 15 to 20 feet wide. This is an ideal tree for narrow spaces. Long, stringlike, soft gray-green, evergreen leaves up to 4 inches long hang from its branches. A clean tree that does not produce much litter—useful around pool and patio areas. Do not plant in lawns. Native to Australia.

Acacia willardiana
PALO BLANCO



With delicate, papery white bark, weeping branches, fine leaves and airy form, this small acacia provides an elegant touch to the landscape. Grows at a moderate rate, reaching 20 feet high and spreading to 15 feet wide. Its open form allows planting of sun-loving perennials below it. Accepts heat, even reflected heat of south-facing walls. Native to subtropical Sonora, Mexico.

Albizia julibrissin
SILK TREE,
MIMOSA TREE



A deciduous tree that grows rapidly from 25 to 35 feet high and as wide. Develops a wide canopy with graceful, light green, feathery foliage. Best to stake young trees to develop form. Produces an abundance of rich pink, silky flowers in summer and sporadically at other times of the year. As flowers and pods drop, they create litter. A nice tree to view from above. Occasional deep watering is essential, otherwise, the tree is typically short-lived. Native to Asia.

Arecastrum romanzoffianum
QUEEN PALM

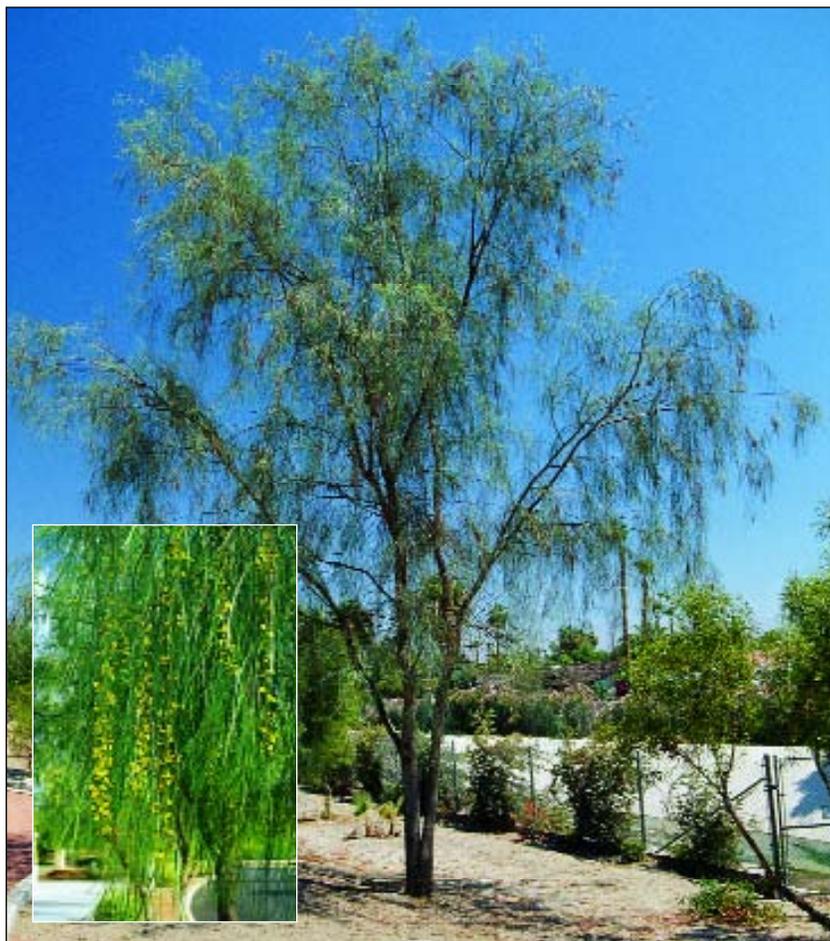


(*Syagrus romanzoffianum*). Grows with a straight trunk 25 to 40 feet high with graceful, arching, feathery leaves. It responds to regular moisture and fertilizer during warm periods, but encouraging too-rapid growth can cause fronds to break. Locate

Below left: *Acacia stenophylla*, shoestring acacia.

Below right: *Acacia farnesiana*, sweet acacia.

Below: *Albizia julibrissin*, silk tree.





Top left: *Brahea armata*, Mexican blue palm.

Above: *Bauhinia lunarioides*, white orchid tree.

Above right: *Bauhinia variegata*, purple orchid tree.

in areas protected from strong winds. Protect young trees when temperatures drop below 30°F. Water deeply when sustained high temperatures reach 110°F to 120°F. A clean plant to have around pools. Native to Brazil.

once each week in summer. Plant in well-drained soil. Native to China.

Bauhinia species ORCHID TREE

Depending on the species, Bauhinia are native to the Chihuahuan Desert or to Asia. The Asian species are very frost tender, but the Chihuahuan natives are rough, and tough, and can take heat and cold. Bauhinia leaves are butterfly-shaped, but you'll want to grow them for their gorgeous, orchidlike flowers.

Bauhinia blakeana   32°
HONG KONG ORCHID TREE
Grows at a moderate rate from 15 to 20 feet high and wide. Abundant maroon to pink flowers bloom from December to April, and are quite dramatic in size and color. Deep water at drip line of tree about

Bauhinia lunarioides   15°
WHITE ORCHID TREE
(*B. congesta*). Another common name for this plant is Chihuahuan orchid shrub. It can be pruned into a small tree but usually is more shrublike, growing slowly to 15 feet high. Produces large clusters of fragrant, white or pink flowers in spring. Water deeply every three weeks during summer. Native to Chihuahuan Desert.

Bauhinia purpurea   25°
PURPLE ORCHID TREE
Grows at a moderate rate to 30 feet high with umbrella-shaped canopy and gray-green leaves. Water deeply about once every week during summer. Native to India.

Bauhinia variegata   25°
PURPLE ORCHID TREE
Like *Bauhinia purpurea*, also called the purple orchid tree. It forms a dense, medium green crown at a moderate to rapid rate up to 25 feet high with an



equal spread. Profuse magenta to purple flowers cover the branches in late winter. White-flowered forms are available. Mature trees can be seen throughout the Coachella Valley. Native to India and China.

Brachychiton populneus
BOTTLE TREE



Adapted to hot, dry and windy conditions. Evergreen, shiny, dark green leaves cover a pyramidal form that grows at a moderate rate from 30 to 50 feet high, spreading to 20 feet wide. Water at the tree's drip line (see page 29) to encourage a deep, wide-spreading root system. Prune in winter to remove dead wood and control wayward branches. Leaf drop occurs in early spring as new leaves crowd out the old ones. Seed pods drop in late summer. Acidify soil to avoid chlorosis. Native to Australia.

Brahea armata
MEXICAN BLUE PALM



(*Erythea armata*). Slowly grows from 20 to 30 feet high, spreading only 10 feet wide,

making it well-suited to small gardens. Icy blue fan-shaped fronds are an attractive feature. Use as an accent or blend with other silvery-leaved plants. Low litter plant, good near pools. Mature plants feature creamy flower clusters 6 to 10 feet long in summer. Native to Baja California.

Brahea edulis

GUADALUPE ISLAND PALM



Featuring light green fan-shaped fronds, this fan palm grows slowly to 30 feet high, and spreads to about 10 feet at maturity. An ideal palm accent in small areas or around pools—it can take extreme heat and reflected light. Provide monthly deep waterings in summer heat. Native to Guadalupe Islands in Baja California.

Butia capitata

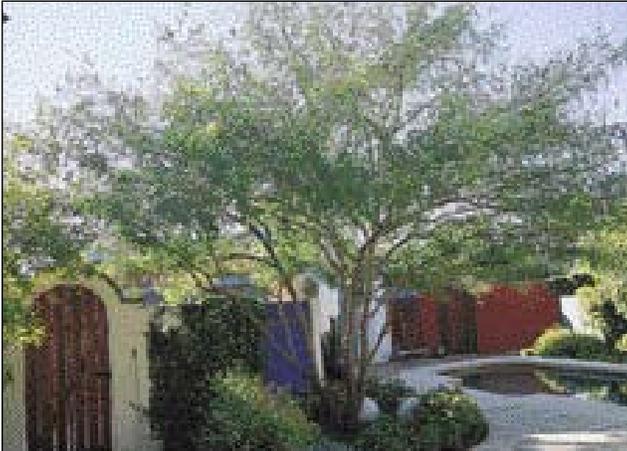
PINDO PALM



(*Cocos australis*). Accepts frost and extreme heat and sun—hardships of every kind. Grows slowly 10 to 20 feet high with an equal spread. Gray-green, feathery leaves are long and graceful. Uniquely rugged trunk shows off the former leaf

Above left: *Bauhinia blakeana*, Hong Kong orchid tree.

Above: *Brachychiton populneus*, bottle tree.



Top left: *Ceratonia siliqua*, carob.
 Above: *Caesalpinia cacalaco*, cascalote.
 Above right: *Callistemon viminalis*, weeping bottlebrush.

bases, helping making this palm an ideal accent plant. Apply fertilizer to the soil if leaves yellow. Native to Brazil, Uruguay and Argentina.

Caesalpinia cacalaco   
 CASCALOTE

An attractive, vase-shaped small tree, growing at a moderate rate to 15 feet high and almost as wide. Spikes of clear yellow flowers bloom at the branch tips late winter into early spring. Flowers can be damaged by late frosts. Avoid by planting in a protected location. Luxuriant foliage is armed with rose-sized thorns, so place away from pedestrian traffic. Plant in well-drained soil. Prune after the flowering season ends to control ungainly growth. Native to Vera Cruz, Mexico.

Callistemon viminalis   
 WEEPING BOTTLEBRUSH

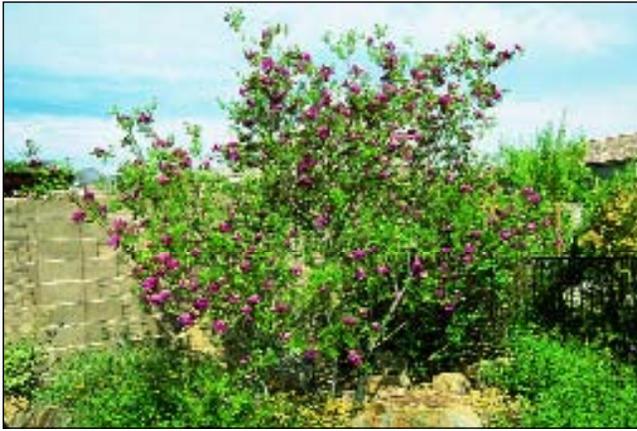
An exceptional small tree that grows at a moderate rate from 20 to 30 feet high with a 15-foot spread. This freely branching evergreen has pendulous branches that

become covered with magnificent, red, bottlebrush flowers midspring and summer. Attracts butterflies and hummingbirds. Do not plant in lawns—the roots do not like to be that moist. Also avoid windy locations. Native to Australia.

Callistemon citrinus is similar but has a less weeping form.

Ceratonia siliqua   
 CAROB,
 ST. JOHN'S BREAD

This is a large, wide-spreading evergreen tree growing from 20 to 40 feet high and as wide. Moderate rate of growth. Carob's round-headed form is densely branched and provides deep, cooling, welcoming shade. Compound leaves are a lush, shiny deep green. Female plants develop long, brown seed pods that can be messy. Male plants do not produce pods. Water deeply and infrequently to encourage deep rooting. Young trees need cold protection below 25°F. Native to the Mediterranean.



Cercidium species were recently reclassified as *Parkinsonia*. See page 58.

Chamaerops humilis
MEDITERRANEAN FAN PALM



This is a slow-growing, multitrunked fan palm. Dwarfish in habit, it's a fine palm for a small yard. Attains height of 10 to 12 feet at maturity. Faster growth with regular water and fertilizer during warm season. Leaves are small and abundant, the *petioles* (see page 153) armed with sharp spines. Plants may sucker freely, spreading to form a dense clump. A handsome tub plant or a featured plant near pools. Native to the Mediterranean and north Africa.

Chilopsis linearis
DESERT WILLOW



This light, airy, 25- to 30-foot deciduous tree is perfect for locations where you need summer shade but want winter sun, such as on the south side of the house. Graceful, light-green leaves provide a splendid backdrop to clusters of large, orchid-like flow-

ers that come in a wide variety of pinks, reds and purples. Many horticultural varieties of this lovely tree are now available, including some which flower spring and summer. Do any heavy pruning during the deciduous period—December into February. Prune to control growth, create new flowering wood and to display the handsome, smooth gray trunks. Native to Sonoran and Chihuahuan desert arroyos, it does best in soil with good drainage.

Chitalpa X tashkentensis
CHITALPA



This tree is a hybrid from Russia that is a cross of two genera, *Chilopsis linearis* and *Catalpa bignonioides*. Chitalpa combines some of the best characteristics of both plants. It is more evergreen and has larger, more vivid, white or pink flower clusters compared to its parents. Mature size of 20 to 30 feet high and as wide works well in most small gardens. Accepts partial shade. Availability at nurseries may be limited, but worth the search.

Top left: *Chilopsis linearis*, desert willow.

Left: *Chamaerops humilis*, Mediterranean fan palm.

Above: *Chitalpa X tashkentensis*, chitalpa.

Below: *Dalbergia sissoo*,
Indian rosewood.

Below center: *Cupressus arizonica*, Arizona cypress.

Below right: *Cupressus sempervirens*, Italian cypress.

Chorisia speciosa

SILK FLOSS TREE,
KAPOK



Also called the drunkard's tree, because the mature trees look like a giant, lime green Chianti bottle topped with spreading boughs. Trunk has distinctive thorns. (See photo page 53.) In fall, profuse numbers of large, rose to wine-colored flowers appear, followed by seed pods filled with white cottony kapok, once used to fill life vests. Trees can reach 30 to 50 feet high and spread 25 to 40 feet, so they're not a good choice for a small garden. Occasionally deciduous prior to bloom period. Avoid windy locations. Water deeply. Native to Brazil and Argentina.

Cupressus arizonica

ARIZONA CYPRESS



This is a superior, medium-sized evergreen for use as a windbreak or tall screen in low-maintenance situations. Grows at a moderate rate from 30 to 40 feet high and 30 feet wide with a pyramidal form. Gray-green, scalelike foliage varies from plant to plant. Branches have a distinct whipcord texture. Thrives in low-rainfall areas when established. Resistant to

cypress canker.

'Gareei' is a grafted selection, which means plants will consistently have rich, silvery, blue-green foliage. 'Blue Ice' features silvery-blue foliage. 'Compacta' has a more compact growth form.

Note: *Cupressus arizonica* is often called rough-barked Arizona cypress, and *C. glabra* as smooth-barked Arizona cypress. Rough-barked Arizona cypress is known to perform better in the Coachella Valley.

Cupressus

sempervirens

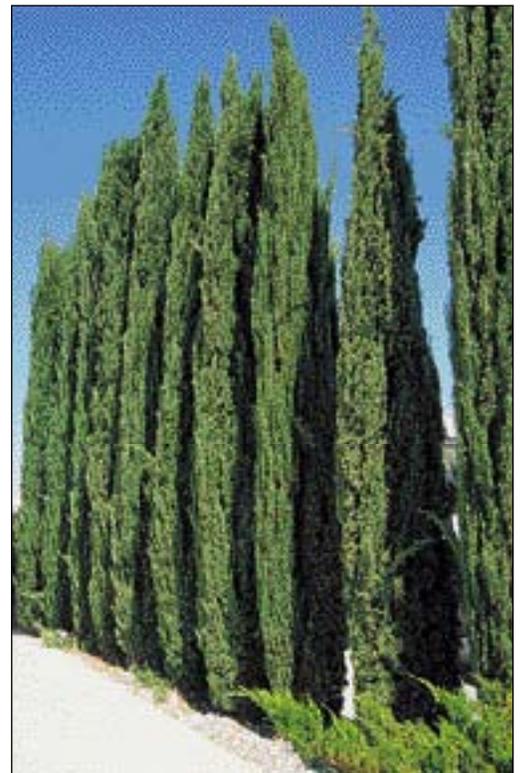
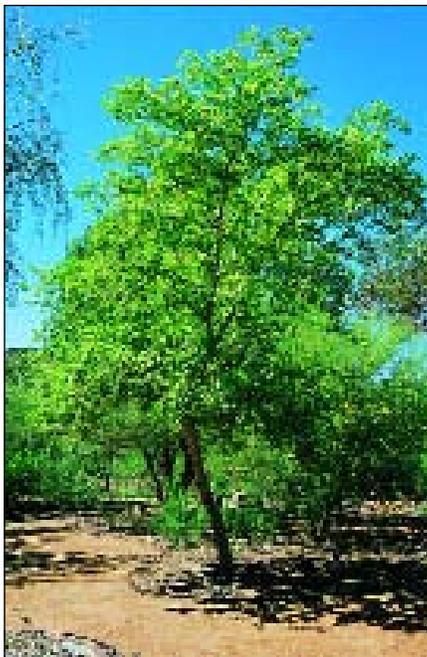
ITALIAN CYPRESS



This tall, vertical accent tree is often used in formal landscapes. It is propagated by cuttings rather than grown from seed to reproduce its desired qualities. The distinctive, narrow and dense columnar form reaches 20 to 60 feet high.

Red spider mites can appear in summer and kill drought-stressed trees. Water deeply every three weeks to avoid this problem. Treat mites when they appear. Native to the Mediterranean.

'Glauca' has attractive, bluish green, juniperlike foliage. 'Stricta' is similar in form and size with dark green foliage.



Dalbergia sissoo
INDIAN ROSEWOOD



This is a moderately fast growing shade tree that generally reaches 40 feet high and 30 wide with a rounded crown. Evergreen to cold-deciduous with below-freezing temperatures, but recovers quickly in spring. Bright glossy, lush green leaves make this a pleasant shade tree. Wide spreading roots are useful to stabilize erosion-prone banks and slopes. This is not commercial rosewood, but is used in its native India as a timber tree.

Dalea spinosa
DESERT SMOKE TREE



(Recently reclassified as *Psoralea spinosa*.) This native of the Mojave and Sonoran Desert is often overlooked when planning a landscape, and that is a shame. Native to the Coachella Valley region, it survives wonderfully without much care other than shaping young trees into tree form (if desired). Grows better with some extra water; its natural habitat is along desert washes. Does best in sandy to rocky soils.

This small tree is well-suited to today's smaller lots. Unlike many other desert

trees, it fills in densely to provide an effective screen. Grows at a slow to moderate rate from 15 feet high and as wide. In late spring the silvery gray, smoky-looking branches are virtually obscured by the striking, fragrant, deep purple-blue blooms.

Eriobotrya japonica
LOQUAT, JAPANESE PLUM



Lush, tropical-looking fruit tree that grows at a moderate rate to 15 feet high and as wide with a rounded crown. Plant in a location protected from high winds, and where it will receive afternoon shade. Woolly, cream-colored flowers in fall produce delicious, pear-shaped clusters of fruit in spring. Trees will recover from hard freezes, but fruit are damaged at about 28°F. For highest quality fruit, select a named grafted cultivar such as 'Champagne', or 'Thales'. Native to Japan and China.

Eucalyptus species

EUCALYPTUS

All of the readily available species of eucalyptus are evergreen and grow rap-

Below left: *Chorisia speciosa*, silk floss tree.

Below: *Eriobotrya japonica*, loquat.



Below: *Eucalyptus cinerea*, silver dollar tree.

Below right: *Eucalyptus spathulata*, swamp malee.

idly when young. The trees are evergreen, but individual leaves are constantly being shed with new leaves replacing them. This makes them poor choices near pools. Twigs and bark of some species also create litter. Most species produce flowers that are generally inconspicuous cream-colored puffs followed by small seed pods.

Natives of Australia, many species of eucalyptus have been imported to the West, where they are used in home and commercial landscapes. Initially, they served to drain swampy areas, and planted as windbreaks to protect orchards and homesites. They continue these utilitarian roles today. A serious pest, eucalyptus thrips, can kill trees if not controlled. Treat for thrips when you first discover them.

Selecting eucalyptus for a home landscape requires careful planning, because many species grow to 60 feet or even higher—much too large for most residences. Smaller species are better suited to the size and scale of most home lots. Be particularly careful when selecting trees if power lines are part of your landscape. Encourage deep, wide-spreading roots with deep and wide watering, ideally with drip irrigation.

Eucalyptus cinerea   15°
SILVER DOLLAR TREE
Medium-sized tree from 20 to 50 feet high. It has a tendency to form multiple trunks, which make it attractive when viewed as a silhouette. Gray-green, rounded leaves grow as opposites along the stems. Juvenile leaves are excellent for cut foliage in flower arrangements. Tolerates wind, and can be planted 10 to 15 feet apart as a windbreak. Accepts lawn conditions.

Eucalyptus microtheca   10°
COOLIBAH
Graceful tree from 20 to 40 feet high, but tends to take on a leaning posture unless staked when young. Best results when trained as a single trunk. Trunks of older trees eventually become brown and corky. Can be used as a windbreak, with less fragile branches than other species.

Eucalyptus papuana   20°
GHOST GUM
Grow this stately eucalyptus for its notable, smooth, snowy white trunk. Grows at a moderate rate, reaching from 20 to 60 feet high and 15 to 30 feet wide, often with



multiple trunks. Leaves are leathery, gray to medium green, and pendulous, making it a good specimen tree for the landscape.

Eucalyptus spathulata   18°
SWAMP MALEE

Evergreen, compact and handsome, with multiple trunks. Smooth, reddish to tan, peeling bark adds a sculptural effect. Grows at a moderate rate 15 to 30 feet high with an equal spread. Graceful, ribbonlike leaves 2 to 3 inches long are grayish green. Makes an excellent screen or windbreak. Its size, color and texture allows swamp malee to blend better with desert vegetation than most other eucalyptus. Tolerates salty, poor soil, and can be planted near lawns.

Eysenhardtia orthocarpa   15°
KIDNEYWOOD

(*E. polystachya*). A small, thornless tree to 15 feet high, sometimes more, spreading to 10 feet wide. It tends to be multitrunked, and can be kept as a shrub. Grows at a moderate rate with an open and airy form. Light green, compound leaves allow for excel-

lent filtered light for plants such as perennials or small shrubs underneath. Accepts some shade. Fragrant white flower spikes are pollinated by butterflies, and bloom through summer. Native to Arizona.

Fraxinus uhdei   22°
'Majestic Beauty'
MAJESTIC BEAUTY,
EVERGREEN ASH

Vigorous growth, reaching 50 to 60 feet high with 50-foot spread. Strong branching habit. Exceptionally large, compound, glossy, dark green leaves add splendor to this medium-sized, round-headed tree. Cold-deciduous below 30°F. More uniform growth than other ashes and more cold tolerant, but leaves may burn if subjected to hot winds. Deep irrigation helps reduce surface rooting. Parent stock native to streamsides in Mexico.

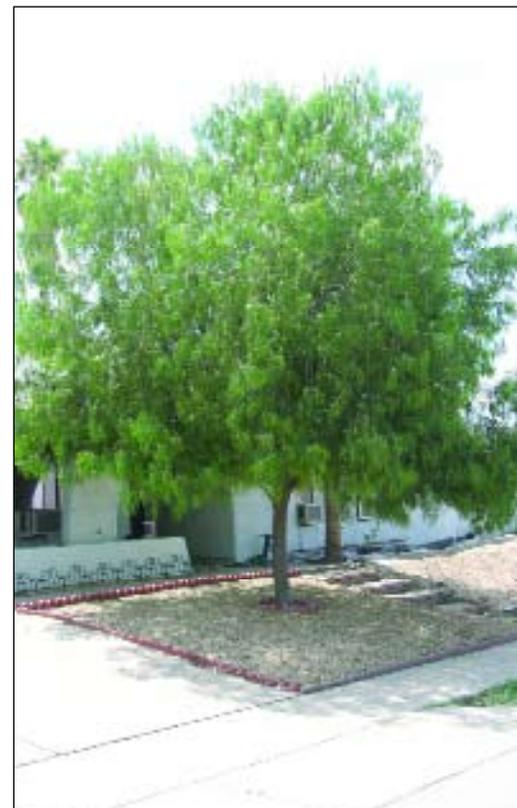
Geijera parviflora   30°
AUSTRALIAN WILLOW

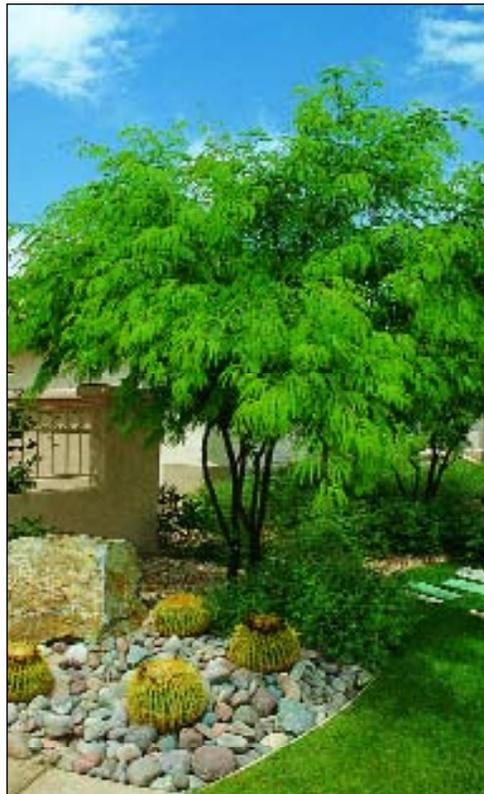
This evergreen, graceful, fine-textured tree grows at a moderate rate, reaching 15 to 25 feet high and 15 to 20 feet wide. Rounded to pyramidal in form, it remains small

Below left: *Eysenhardtia orthocarpa*, kidneywood.

Below center: *Eucalyptus microtheca*, coolibah.

Below: *Geijera parviflora*, Australian willow.





Above top: *Lagerstroemia indica*, crape myrtle.
 Above and above center: *Lysiloma watsonii* var. *thornberi*, feather tree.
 Above right: *Jacaranda mimosifolia*, jacaranda.

enough for patios. Plant it for the weeping willow appearance created by the medium green, strap-shaped leaves. Uniform growth at a moderate rate can be accelerated with additional water. Good soil drainage is essential. Native to Australia.

Jacaranda mimosifolia   20°
 JACARANDA

(*J. acutifolia*). This is a large, round-headed, semievergreen tree that grows at a moderate to rapid rate 30 to 50 feet high and 15 to 30 feet wide. Best for parks, commercial use or large residences due to its size. Lacy, fernlike, green leaves and large clusters of attractive, lavender-blue flowers bloom profusely May and June, producing an appealing tropical effect. As flowers drop, they produce a fair amount of litter, so avoid locating trees near swimming pools. Plant in soil with good drainage. Water deeply to reduce development of surface roots but do not overwater. Water weekly in growing season, but only once or twice during dormant winter period. Suckers if pruned too drastically. Native to Brazil.

Koelreuteria bipinnata   28°
 CHINESE FLAME TREE
 (*K. integrifolia*). Grown in part for its

small, yellow, summer flowers. These become inflated papery pods that resemble miniature Chinese lanterns. As the season progresses, the pods change from a creamy white to orange-red and brown. Makes a nice shade tree from 20 to 35 feet high with an equal spread. Trees develop sturdy trunks that are often irregular, but light pruning of young trees can direct growth. Plant in well-drained soil. Deciduous, with variable fall color. Native to China.

Lagerstroemia indica   15°
 CRAPE MYRTLE

Vigorous deciduous tree or shrub that offers year-round interest. Can be trained to become a quality tree to 25 feet, admired for its striking clusters of flowers that bloom summer into fall. Foliage turns bright shades of orange, yellow or red in fall. After leaves drop, the satiny, pale, sculptural bark adds close-up interest. Avoid planting in lawn areas, which can cause plants to develop mildew problems, as will excessive humidity. Can be grown in containers. Many hybrids and cultivars are available in a range of flower colors, including white, pink, red, magenta, lavender and purple. Native to China.



Lysiloma watsonii
var. *thornberi*

FEATHER TREE



(*L. microphylla* var. *thornberi*). Finely divided, fernlike foliage provides a lush, tropical effect. Creates dappled shade that can accommodate underplantings of perennials and small shrubs—highly effective in a mini-oasis setting. By the time plants are 6 to 10 years old, the multitrunk growth can reach 15 to 20 feet. It also can be grown as a shrub. After a spring show of creamy white, puffball flowers, seed pods are numerous enough to create litter in early summer, but are easy to remove. Avoid pruning large branches in summer. Plant in full sun in soil with good drainage. Overwatering during summer can create chlorotic conditions. Although it can freeze to the ground, it will regrow as a large shrub. Native to Sonora, Mexico.

Melaleuca quinquenervia
CAJEPUT TREE



Slender, vertical, evergreen tree from 20 to 35 feet high, spreading 10 to 20 feet wide. Bark is white to light brown, thick, corky and peels off the trunk in sheets. Rich green foliage is graceful, thickly covering

the branches. Thin branches as necessary as tree ages, but do not top. Stands up to strong winds. Slender spikes of creamy white flowers adorn branches in summer. Water deeply to encourage deep rooting. Accepts some shade. Native to Australia.

A related species, *Melaleuca alternifolia*, is the source of “tea tree oil.”

Olea europaea
FRUITLESS OLIVE



Olive is a time-honored, quality, evergreen tree with an informal, picturesque growth habit. Grows at slow to moderate rate 20 to 30 feet high and as wide, as a standard form, or with multiple trunks. With time, trunks become gnarled, adding to the tree’s character. Distinctive, narrow, gray-green leaves reach up to 3 inches long. Olive fruit can become a problem, littering and staining pavement. Pollen production also affects many people with allergies. ‘Swan Hill’ is a fruitless selection.

Accepts low water applications, but additional moisture produces a more handsome tree. Avoid heavy pruning, especially late spring through summer, which can allow sun to damage trunk. Keep lower trunks shaded. If trees are pruned up, they will sucker profusely to shade them-

Above left: The distinctive bark of *Melaleuca quinquenervia*, cajeput tree.

Above: *Olea europaea*, olive.

Below: *Parkinsonia* hybrid  Desert Museum palo verde.

Below left: *Parkinsonia floridum*, blue palo verde.

Below right: *Olneya tesota*, desert ironwood.



selves. (Pull off suckers rather than pruning them.) Olives accept almost any soil, endure heat, cold and wind. Native to the Mediterranean.

Olneya tesota
DESERT IRONWOOD



Just as olive trees create a focal point in the landscape, desert ironwood possesses a similar presence, with gray-green foliage and gray trunks with real character. Lavender, pealike flowers give trees an otherworldly glow in April and May, attracting bees in abundance. Slow growing from 25 to 30 feet high and as wide. It requires some patience but the reward of a quality, long-lived tree is worth the wait. Sharp thorns on branches can be a safety hazard near walkways as well as when pruning trees. Requires well-drained soil. Native to the Sonoran Desert.

Parkinsonia species

PALO VERDE

(*Cercidium* species). These American desert natives provide a definite personality to the landscape. They are easily recognized due to their blue-green to green bark, natu-

rally occurring multiple trunks and graceful elegance. Most are wide spreading from 25 to 35 feet with a similar height, which varies according to the species, moisture, and soil type. Masses of yellow flowers cover the trees in April and early May. All tolerate extremes of heat, sun, and soils, although they do best well-drained soils.

Parkinsonia floridum
BLUE PALO VERDE



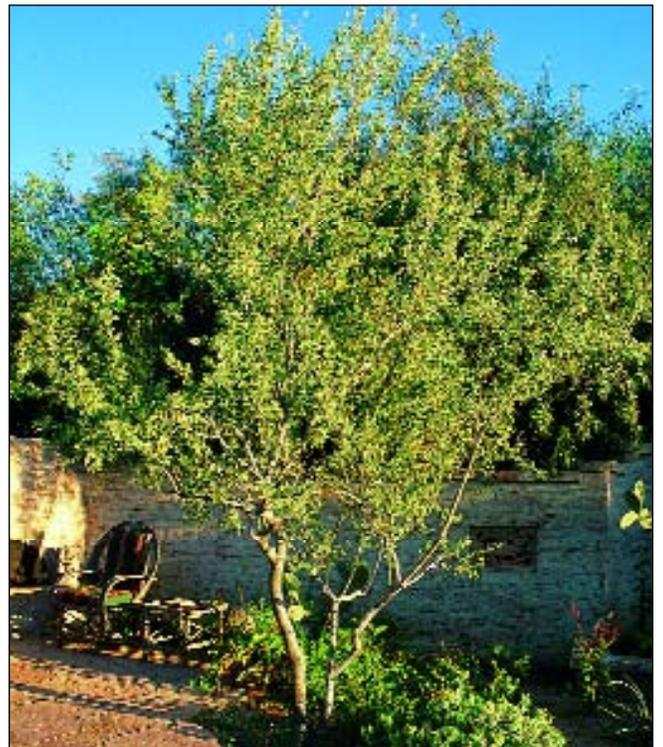
Blue palo verde is one of the most colorful desert trees. The strong, multitruk form grows rapidly, developing a spreading canopy to 35 feet high and 30 feet wide, producing filtered shade. Luxuriant, golden yellow flowers appear in profusion March into April. Bark is a striking bluish green. With age, main trunk darkens to brown. Encourage its natural, angular form and avoid pruning heavily at any one time, which can interrupt growth patterns. Native to the Sonoran Desert.

Parkinsonia microphylla

LITTLE LEAF PALO VERDE
FOOTHILLS PALO VERDE



Bark is lime-green. It grows slowly to 20 feet high, with a smaller, stiffer appear-





ance than *Parkinsonia floridum*. Tree is semideciduous—leaflets drop in cold or drought. Yellow flowers appear April into May. Slow growth rate can be accelerated by supplying additional moisture. Twiggy growth and low canopy provide shelter for wildlife. Ideal background tree or for screening. After young trees are established, electively thin branches to show off interesting trunk structure. Makes an excellent small patio tree with character. Native to Arizona and Baja California.

Parkinsonia hybrid
‘Desert Museum’

DESERT MUSEUM
PALO VERDE



This superior *Parkinsonia* is a result of hybridizing work involving *P. floridum*, *P. microphyllum* and *P. aculeata*, Mexican palo verde. This work was performed at the Arizona-Sonora Desert Museum in Tucson. Growth pattern of thornless ascending branches produces a sturdy structure and strong vertical form. Mature height is 25 feet to 30 feet with 20-foot spread. Flowers are rich yellow. The main bloom occurs during spring, although it flowers sporadically during summer with supplemental irrigation. Plant in deep soil.

Parkinsonia praecox
PALO BREA,
SONORAN PALO VERDE



Grows slowly into a 15- to 25-foot tree. Vivid yellow flower clusters bloom in April into May. Palo brea has a more upright structure and thornier branches than other *Parkinsonia* species, with distinctive, sculptural, angular branches. Bark on trunks and branches remains green, even as tree ages. Occasional deep watering improves appearance. Native to southern Sonora, Mexico.

Phoenix dactylifera
DATE PALM



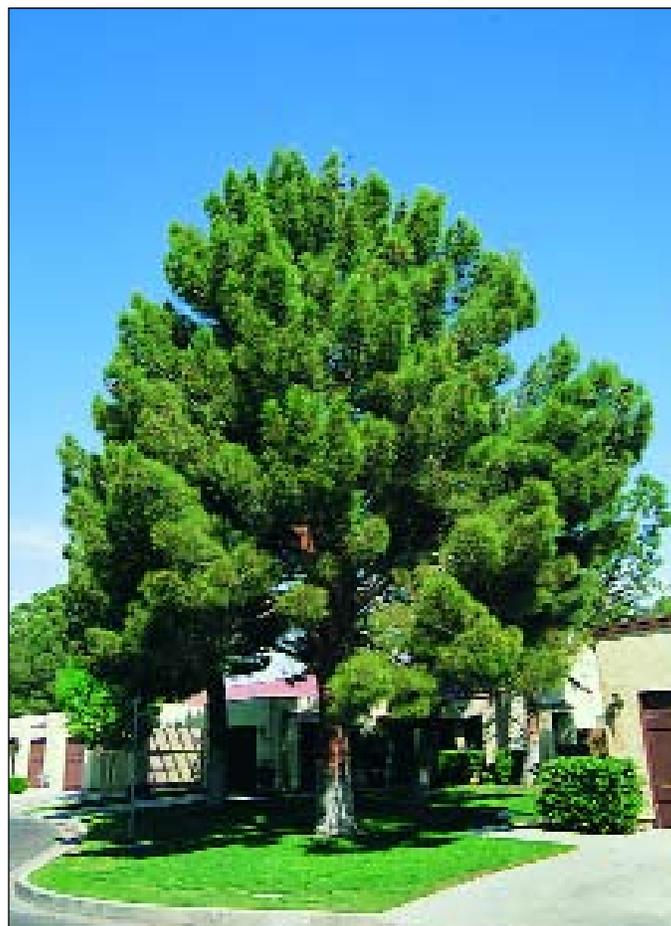
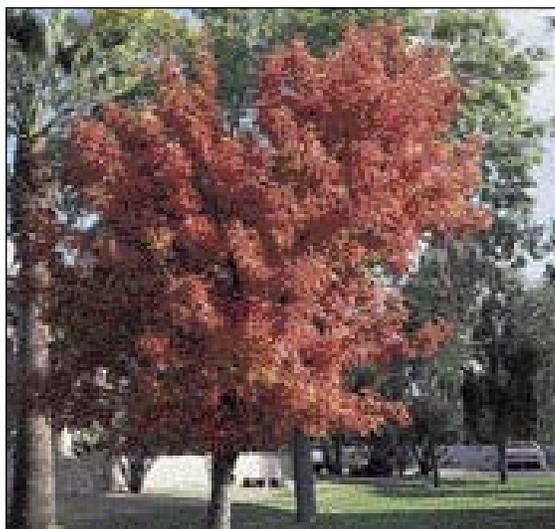
These trees are large and picturesque, plus they produce tasty fruit, but they are not the right choice for a small garden or home. Plants grow slowly but when mature, they reach up to 60 feet high with a trunk 2 to 3 feet in diameter. Young trees need space, the fronds spreading to 25 feet across. Near the trunk, the bases of the feather-shaped leaves have stout thorns. Requires moderate watering throughout summer for trees to look their best. Be aware that fruit drop can be messy, especially around pools and patios. Native to northern Africa.



Above left: *Parkinsonia floridum*, blue palo verde.

Above right: *Parkinsonia praecox*, palo brea.

Above: *Phoenix dactylifera*, date palm.



Above top: *Pinus eldarica*, Afghan pine.
 Above right: *Pinus pinea*, Italian stone pine.
 Above: *Pistacia chinensis*, Chinese pistachio.

Pinus species

PINE

Pines can be grown successfully in the Coachella Valley, as long as adapted species are selected. Some pines can become quite large, so exercise caution when choosing trees for residential-scale landscapes. Pines evoke a feeling of the mountains and create a cooling mood, but it is challenging to blend them with other arid land plants.

Pinus eldarica

AFGHAN PINE,
 MONDALE PINE



(*P. brutia*). Rapid pyramidal growth from 30 to 40 feet high and to 25 feet wide. Accepts heat, severe wind, cold and a variety of soils. In well drained soil, roots are better able to penetrate, allowing for deep rooting and more prolific growth. Use as an attractive, dense windscreen or featured landscape tree. Tolerates windy conditions. Native to Afghanistan.

Similar in appearance is *P. halepen-*

sis, Aleppo pine. Native to the hills of Lebanon, Aleppo pine often suffers from spider mites, and generally does not tolerate Coachella Valley conditions long term as well as the Afghan pine.

Pinus pinea

ITALIAN STONE PINE



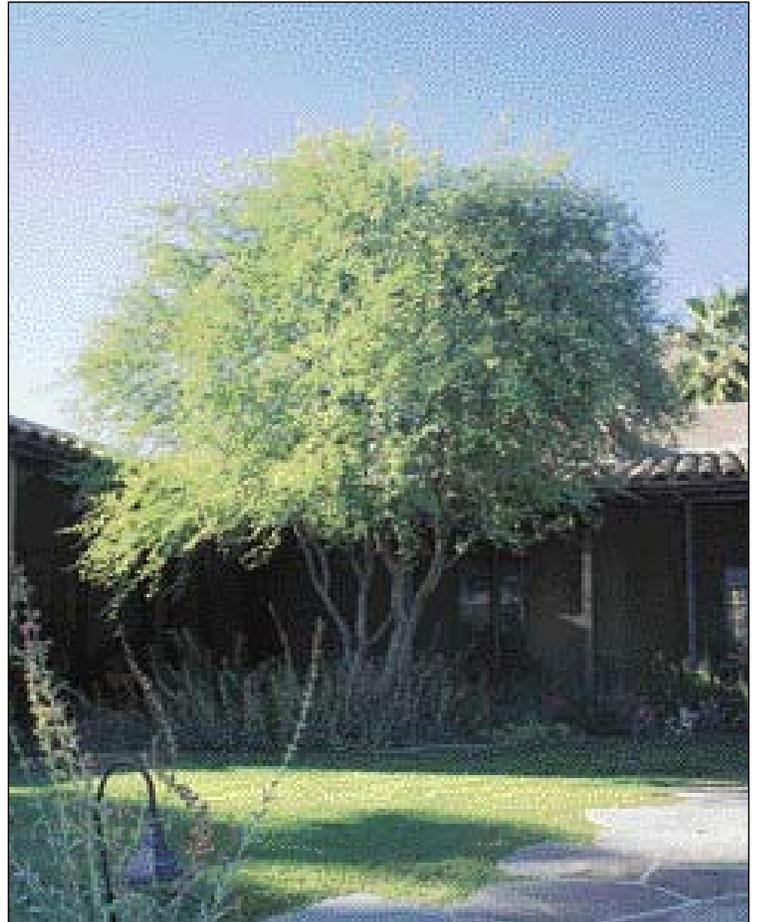
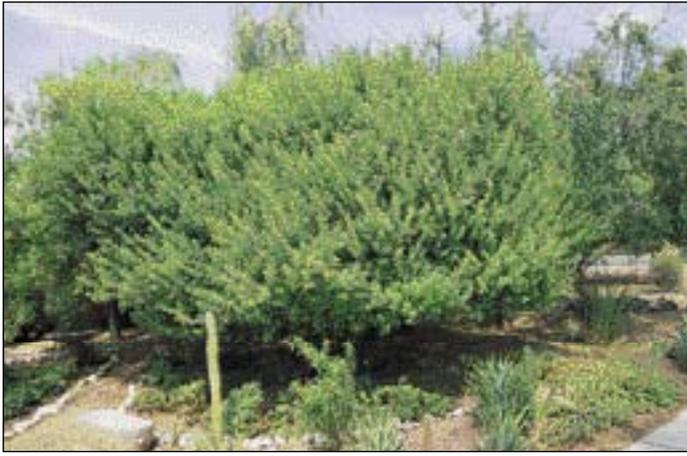
This pine is broadly conical when young, then becomes spreading and flat-topped (shaped like an umbrella) as it ages. Mature size is 25 to 40 feet high, spreading to 25 feet wide. Grows at a slow to moderate rate. Picturesque trunk and branch structure develop over time. Needles are bright green. This tree produces the edible pignolia nut. Native to southern Europe.

Pistacia chinensis

CHINESE PISTACHIO



Moderate growing, long-lived tree from 30 to 40 feet high with a broad-spreading canopy that produces dense shade. Deciduous, with bright green, compound leaves that turn intense crimson colors in fall months. Accepts a wide variety of



adverse conditions. Does best with periodic deep soaking of soil around the root zone. Native to China.

Pistacia lentiscus
 EVERGREEN PISTACHIO   15°
 A slow growing, wide-spreading, evergreen tree, reaching 15 to 20 feet high with a spread to 30 feet wide. The dense, attractive, bluish green foliage makes this a highly useful background tree or screen. Flowers are inconspicuous. Tolerates drought, heat and salty soils. Native to the Mediterranean.

Pithecellobium flexicaule
 TEXAS EBONY   10°
 (Newly reclassified as *Ebanopsis ebano*.) The dense, dark green leaves and spiny twigs of Texas ebony can develop into a great security barrier. Even without a utilitarian use in mind, its picturesque form makes this a desirable tree for a small garden. Avoid planting near walkways or other pedestrian traffic areas due to its

small, sharp thorns. A slow grower, the mature height is 20 to 30 feet with a spread of 15 to 20 feet, but this will take many years. Fragrant, cream-colored flowers add color in late spring, they are followed by large, decorative, woody, brown seed pods. Grows in almost any well-drained soil. Native to Texas and New Mexico.

Pithecellobium mexicanum
 MEXICAN EBONY   15°
 (Newly reclassified as *Havardia mexicana*.) Lovely, smooth, gray bark and a naturally rounded form make this a great addition to the landscape. A moderately fast grower, reaching around 30 feet high and as wide but usually less in a low desert climate. Its fine-textured, gray-green foliage is cold deciduous. Creamy yellow puffball flowers appear in spring, followed by ornate woody brown pods. Best when planted in well drained soil. Native to Sonora and Baja California.

Pittosporum

Top left: *Pistacia lentiscus*, evergreen pistachio.

Above left: *Pithecellobium flexicaule*, Texas ebony.

Above: *Pithecellobium mexicanum*, Mexican ebony.

Below and below center (top): *Prosopis glandulosa* var. *glandulosa*, honey mesquite.

Below center (bottom): *Prunus cerasifera* ÖKrauter VesuviusÖ, purple plum.

Below right: *Pittosporum phillyraeoides*, willow pittosporum.

phillyraeoides    20°
WILLOW PITTOSPORUM

This is a handsome, evergreen tree, reaching 15 to 20 feet high, spreading 10 to 15 feet wide. Moderate growth rate. Light, gray-green, ribbony leaves to 4 inches long “weep” downward. Makes a fine vertical accent. Stake young trees to provide a straight start. Small, fragrant, yellow flowers bloom late winter to early spring. Native to Australia.

Prosopis species

MESQUITE

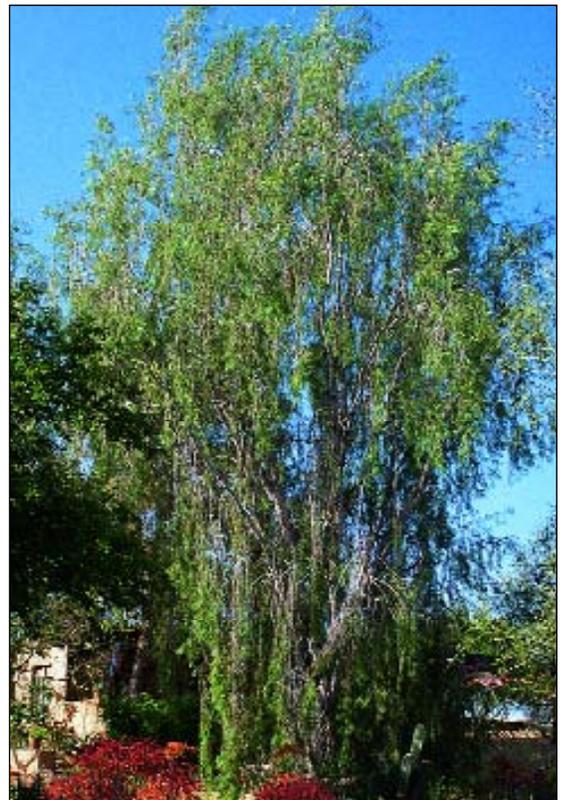
Mesquites offer quite a lot to Coachella Valley gardeners. Their size, form, color and texture are in tune with the desert, helping provide a suitable sense of place. In fact, native mesquites are excellent for residential landscapes. Their quick rate of growth, cooling, sheltering shade and low maintenance make mesquites natural choices. In recent years, the number of selections available to home gardeners has increased. Each has special merit.

Prosopis chilensis    15°
CHILEAN MESQUITE

This mesquite is admired for its ability to provide fast shade and screening. Young trees need staking and adequate ties to help support heavy top growth. Thin no more than 20 percent of interior growth at any one time to prevent sunburn damage. Do not plant within 15 feet of walls because roots tend to be shallow. Water deep and wide to encourage deep, extensive root system that will help trees stand up to strong winds. Moderate thorns. Avoid planting near pools because litter can be a problem throughout the year. Native to Chile.

Prosopis glandulosa
var. *glandulosa*    0°
HONEY MESQUITE

Less rigid in growth form than other mesquites, honey mesquite has a graceful, slightly weeping form that closely resembles *Schinus molle*, California pepper. (See page 66.) It grows at a moderate rate from 15 to 30 feet high with an equal spread. Young branches are thorny. Small, bright green leaves are deciduous (leaves drop in winter). Naturally deep-rooted. Native



to Chihuahuan Desert, and as far north as Oklahoma.

Prosopis hybrid 'Phoenix'
'PHOENIX' MESQUITE



A hybrid with a number of parents, this new cultivar grows quickly but not excessively so, reaching 30 feet high and as wide. Features the dense green foliage of Argentine mesquite, but without thorns, and with the deep-rooting characteristic of honey mesquite.

Prosopis velutina
VELVET MESQUITE



This native mesquite grows to 30 feet high with an equal spread. Foliage is a velvety gray-green, and semideciduous. Seed pods are edible and were a staple food of natives. Young branches have small thorns that become less abundant with maturity. With age, trunks take on a gnarled and shaggy appearance, resulting in trees of great character. Young trees are slow growing and character is more shrublike. Additional water will increase size and growth rate. Native to southeastern Arizona into Texas.

Prunus caroliniana
'Bright 'n Tight'



CHERRY LAUREL

This is a specially selected strain of Carolina laurel cherry, with tight, compact growth 8 to 20 feet high. Glossy, deep green, evergreen leaves on an upright plant that can be either a small multi-trunked tree or large shrub. Small creamy white flowers in March are followed by blackish red berries that birds enjoy. Pick a location with afternoon shade in the Coachella Valley, and don't plant in saline or alkaline soils. Hybrid of parents native to southern Appalachia.

Prunus cerasifera
'Krauter Vesuvius'

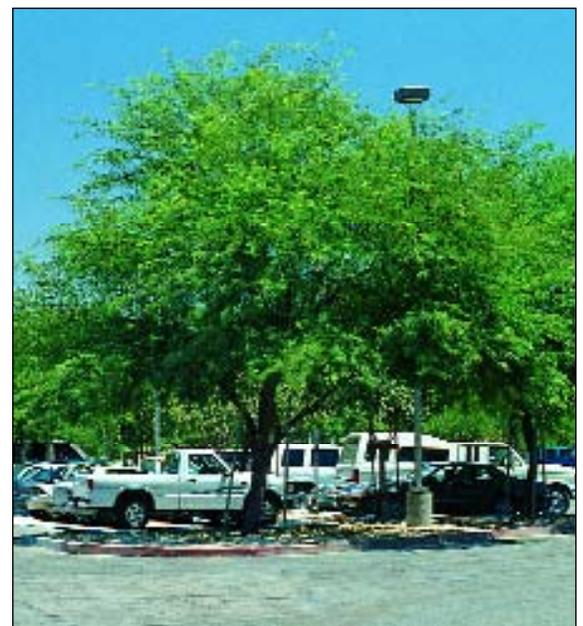
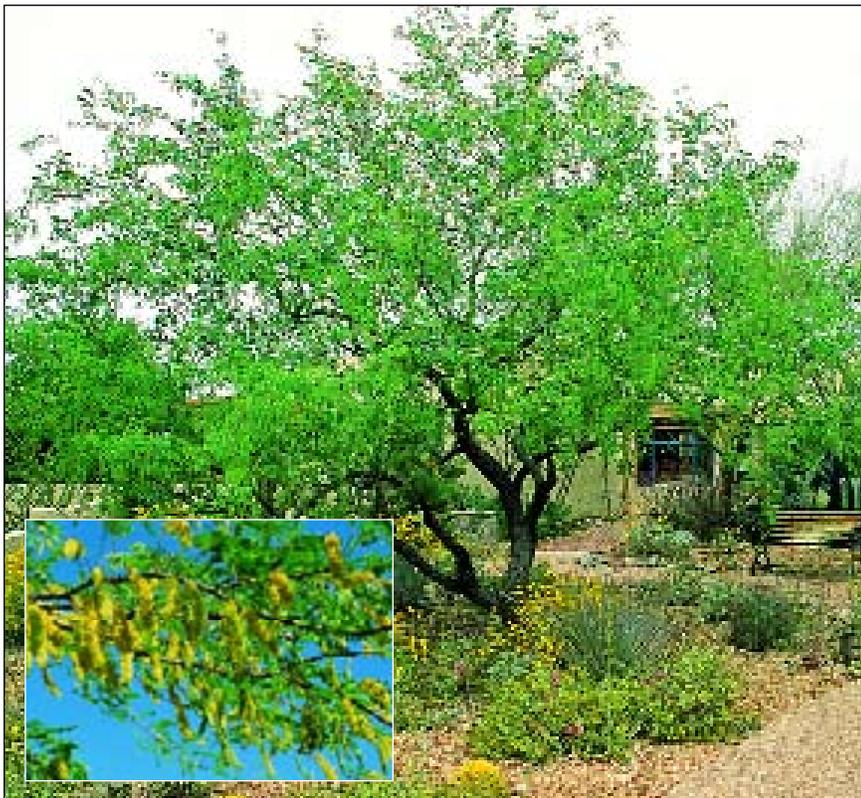


PURPLE PLUM

Open, rounded, tree 10 to 15 feet high, with a rounded crown spreading to 10 feet wide. Admired for its striking, dark purple, almost black foliage. Deciduous. Pink flowers bloom in spring. May bear fruit in summer. Avoid planting in windy locations. Best where it will receive afternoon shade. Hybrid of parents native to the Mediterranean.

Below left: *Prosopis velutina*, velvet mesquite.

Below: *Prosopis chilensis*, Chilean mesquite.



Below: *Quercus virginiana*, southern live oak.

Bottom left: *Punica granatum*, pomegranate.

Bottom right: *Quercus ilex*, holly oak.

Punica granatum
POMEGRANATE



This is a deciduous small tree or shrub 12 to 20 feet high and to 15 feet wide. Well-adapted to the Coachella Valley. Pomegranate has much to recommend it: bright green leaves, large, ruby flowers, healthy fruit, plus golden yellow fall foliage. With time, becomes a great hedge and security barrier plant. Prune when dormant in winter. High-water use in summer if fruit is the goal (See page 147). Otherwise, supply moderate water. Does well in alkaline soils. Accepts some shade. Native to southern Asia.

Many cultivars are available: 'Chico', dwarf carnation-flowered pomegranate, grows to 8 feet high. 'Legrellei' grows 6 feet to 8 feet high, and has double creamy flowers with coral-red stripes. 'Nana', dwarf pomegranate, is more evergreen with dense growth to 3 feet high. It's a dependable performer with orange-red, single flowers and small, dry, red fruit. 'Wonderful' grows to 10 feet high, has orange-red, 4-inch flowers and sweet fruit.



Quercus species

OAK

Oaks are not the trees that spring to mind when one thinks of a landscape for the desert, but these rough and tough trees will accept the heat, drought, winds and occasional cold. They take what the desert dishes out, and with a deep soak once a month in summer, provide the homeowner with a large, stately tree.

Quercus agrifolia
CALIFORNIA COASTAL
LIVE OAK



Large, round-headed, evergreen tree 30 to 50 feet high. Fire-resistant rough, dark brown bark on broadly spreading, picturesque branches that may spread wider than the tree is tall. Dark green, holly-like leaves. Best adapted to Palm Springs area near foothills and canyons. Native to coastal southern California.



Quercus ilex

HOLLY OAK



Excellent, medium-sized evergreen tree from 20 to 30 feet high with equal spread. A multitude of small, medium green, finely toothed, hollylike leaves provide dense shade. Planted in a row, holly oak makes a good hedge. Planted singly, it is a refined and elegant specimen. Tolerates lawn planting. Native to the Mediterranean.

60 feet high with an equal spread. Best performance in well-drained soil. Thrives on deep irrigation. ‘Heritage’ is an improved selection, proven to be adapted to desert heat and wind. Grows rapidly, producing impressive branches and trunk. Native to southeastern U.S.

Q. fusiformis, escarpment live oak, is also recommended. It is very similar to southern live oak.

Quercus suber

CORK OAK



An evergreen tree with broad, rounded crown that produces deep shade. Moderate growth from 25 to 40 feet high with a short trunk. Leaves are lustrous, dark green above, grayish beneath. Pale, thick and deeply furrowed, corky bark adds close-up interest. In certain regions of the world, it is harvested as cork for commercial use. Native to the Mediterranean.

Rhapis excelsa

SLENDER LADY PALM



An exceptionally decorative and rare palm, lady palm forms dense clumps of many individual stems 6 to 8 feet high. Fronds are palmate. Best growth in bright, indirect light and nutrient-rich soil; it responds to applications of fertilizer. Good specimen plant in filtered shade near a pool, or in tubs or planters indoors. Native to Japan.

Quercus virginiana

SOUTHERN LIVE OAK



A quality evergreen tree that grows 50 to

Rhus lancea

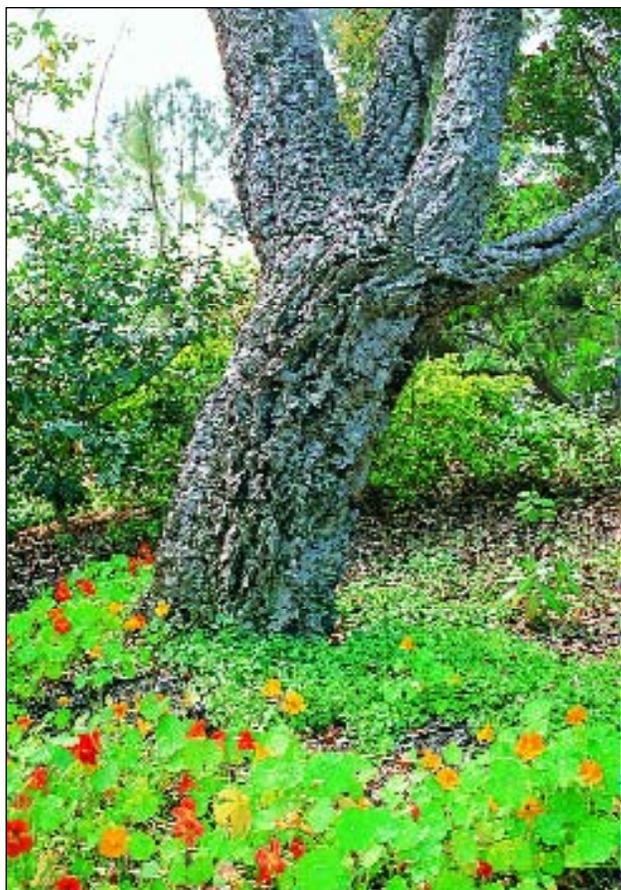
AFRICAN SUMAC



A dense, wide-spreading, evergreen tree with a slight, weeping or drooping growth

Bottom left: *Quercus suber*, cork oak.

Bottom right: *Rhus lancea*, African sumac.





Above: *Sophora secundiflora*, Texas mountain laurel.
 Above right: *Trachycarpus fortunei*, windmill palm.

habit. Mature trees 20 to 25 feet high may spread to 40 feet or more. A workable tree for a small garden but it produces a great deal of litter throughout the year. Reddish stems and shiny, medium green leaves are borne in three slender leaflets. Female plants produce tan to reddish berries in clusters. Avoid heavy pruning at a single session. Some people are allergic to all parts of the tree. Native to South Africa.

feet high and as wide, with glossy green, evergreen leaves. Clusters of purple, wisteria-like flowers bloom in spring and perfume the air with a delightful fragrance. Attractive, grayish white seed pods contain red seeds that are poisonous. Plants have overall great tolerance for desert climates. Accepts almost any well-drained soil. Restrained, compact growth requires minimal pruning. Native to Texas.

Schinus molle   20°
 CALIFORNIA PEPPER

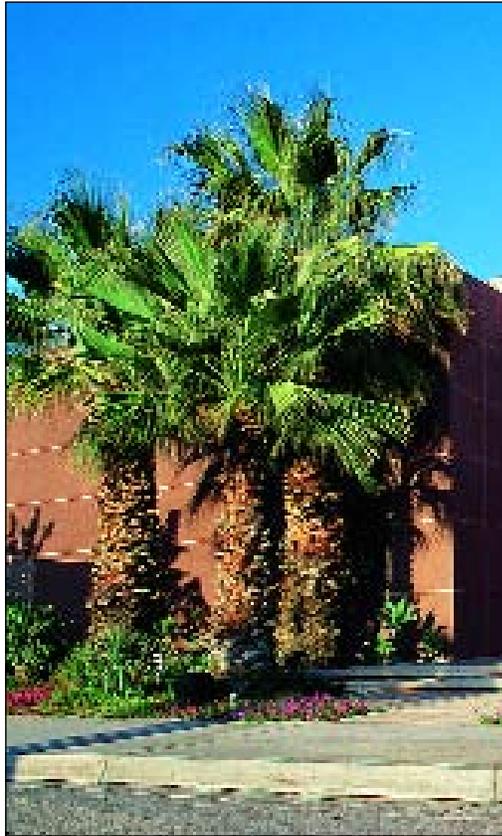
A fast-growing, medium-sized evergreen tree from 30 to 40 feet high. It has a round-headed form with graceful, weeping branches and feathery, bright green foliage. Small, rose-colored berries hang in clusters on branches in fall. Low to moderate water use, depending on soil type. Branches of older trees are prone to breakage in strong winds. Originally native to Peruvian Andes, trees were brought to the early California missions by Spanish monks.

Sophora secundiflora   10°
 TEXAS MOUNTAIN LAUREL

Small tree or large shrub from 10 to 15

Trachycarpus fortunei   10°
 WINDMILL PALM

A superior, middle-sized palm with fan-shaped leaves that radiate like a windmill from its compact crown. The trunk is naturally shaggy with hairy black fibers and old leaf bases. Do not remove these as it harms the plant. Grows slowly 15 to 25 feet high, spreading 6 to 8 feet wide. Trunks can be 1 foot in diameter. This palm does best with afternoon shade, and does not tolerate reflected sun such as near a pool. Give regular applications of water and fertilizer during the warm months. Due to its smaller stature, can be planted in atriums, entryways and even in large containers. Native to China.



Ulmus parvifolia

EVERGREEN ELM,
LITTLE LEAF ELM



This broad, umbrella-shaped tree quickly reaches to 35 feet high and as wide. Plant is semi-evergreen, dropping its small, dark green leaves and regrowing them over several months from winter to early spring. Bark is attractive mottled tan and brown. Water deeply to avoid shallow roots, which can become unsightly (even hazardous) on the soil surface. Native to China.

Vitex agnus-castus

CHASTE TREE



Long-lived and slow growing, this small deciduous tree can take the heat. Narrow leaves produce a spicy fragrance when crunched underfoot after they drop from branches in fall. Grow as a large shrub or small tree 15 to 25 feet high and as wide. Many cultivars are available. Depending on the selection, lavender, blue or white spikes of flowers bloom in summer. They attract butterflies. Cold hardiness also depends on cultivar seed source. Native to southern Europe.

Washingtonia filifera

CALIFORNIA FAN PALM



This is the only palm native to California, growing naturally in Palm Canyon and other canyons in the Coachella Valley. Trunks can become massive, often reaching 3-1/2 feet in diameter. Large fronds are borne on long leaf stems; the leaves are fringed with coarse white hairs. Accepts the desert heat but younger plants prefer some shade. Slower growing than *Washingtonia robusta* (see below), reaching a mature height of 35 to 40 feet. Provide occasional deep watering.

Washingtonia robusta

MEXICAN FAN PALM



(*Washingtonia gracilis*). This native of Baja California is similar to California fan palm, but its trunk is more slender, usually 15 to 18 inches in diameter. It has a faster growth rate compared to *W. filifera*. Fronds are smaller with shorter stems and fewer filaments. Mexican fan palm becomes a skyline tree, reaching 50 to 75 feet high. Group only with own species in clumps of plants that are of staggered heights. Provide occasional deep watering.

Above left: *Vitex agnus-castus*, chaste tree.

Above center: *Washingtonia filifera*, California fan palm.

Above: *Washingtonia robusta*, Mexican fan palm.

SHRUBS

LUSH & EFFICIENT

Shrubs are similar to trees in that they serve many landscape functions. Use them as specimens, accent plants, group plantings, borders, hedges, screens, barriers, backdrops and foundation plantings. Shrubs provide shade, fruit, habitat and food for wildlife. People enjoy their fragrance and culinary use, as well as their seasonal color and interest.

Shrubs are smaller and lower growing compared to trees, so we see them in greater detail. Shrubs help bring the landscape scale down to human scale. Although many shrubs have beautiful flowers, some last for just a short while. Select shrubs for their shape, form, texture, foliage, branching habits and the substance and utility they add to your landscape.



Abutilon palmerii
DESERT ABUTILON,
INDIAN MALLOW



Grows up to 5 feet high and as wide with an upright and open form. Velvety heart-shaped leaves and flowers like hollyhocks lend an almost tropical quality. Plants tolerate hot, dry conditions but soak the root zone every week or so in summer to maintain appearance. Appreciates afternoon shade. Much less water is needed in the cool seasons of the year. Native to Sonoran Desert.

Alyogyne huegelii
BLUE HIBISCUS



An attractive member of the mallow family, this plant grows to 5 feet high and spreads to 4 feet wide. It can also be pruned to become a small tree. Blue-purple flowers bloom from spring into fall, the individual blooms lasting two to three days. Does best in afternoon shade or on the north side of a building. Pinching back branches can increase flowering, but avoid shearing or topiary pruning. If damaged by frost, wait until spring to prune damaged

branches. Accepts container culture, and must have well drained soils. Keep in mind that the dark green leaves are covered with tiny hairs that can irritate sensitive skin. 'Santa Cruz' produces an attractive, deep blue flower. Native to coastal southwestern Australia.

Ambrosia deltoidea
TRIANGLE LEAF BURSAGE



This small evergreen shrub is primarily used for revegetation and erosion control. It reaches 1 to 2 feet high and as wide, with a naturally rounded form, featuring silvery gray foliage. Moderately rapid growth. Once established it can survive with only an occasional watering, but better appearance with summer waterings. Flowers are small and insignificant. A relative of ragweed, some people are allergic to its pollen. Native to southern Arizona.

Anisacanthus species
DESERT HONEYSUCKLE



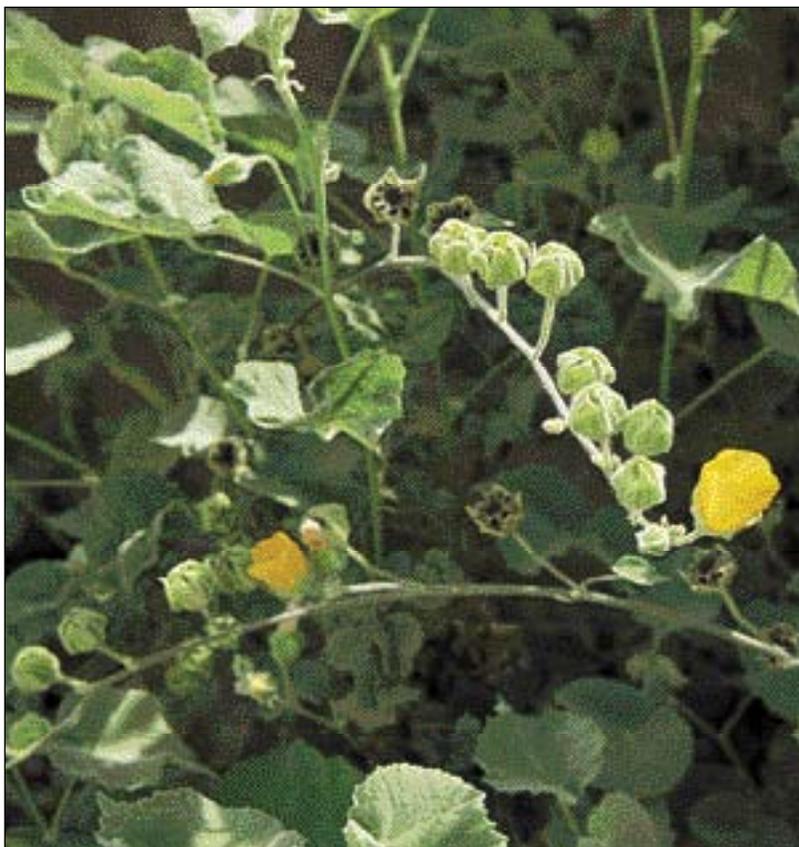
Two *Anisacanthus* species share the common name of desert honeysuckle. Hummingbirds and butterflies flock to the

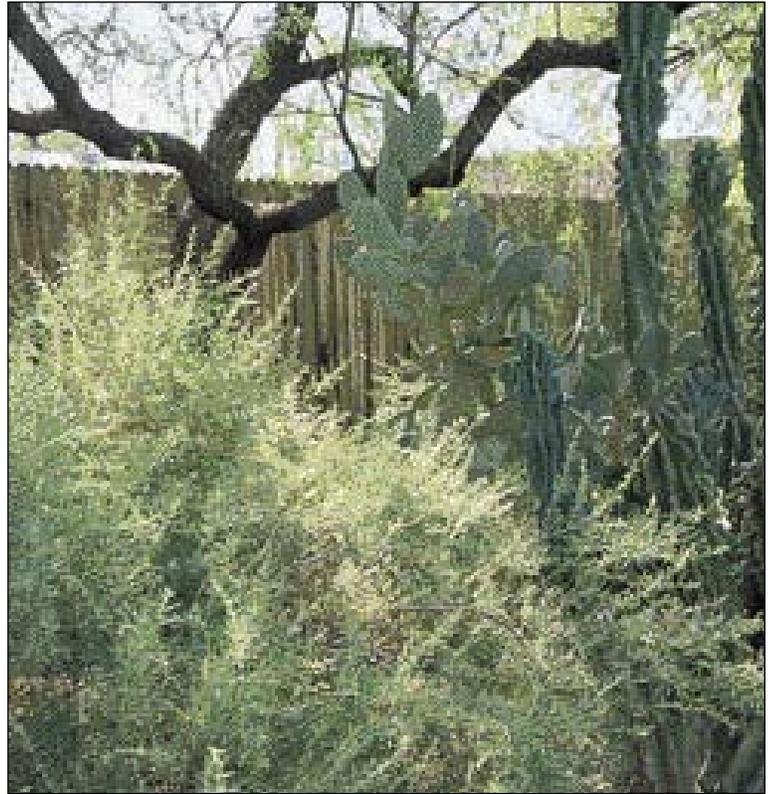
Below left: *Abutilon palmerii*, desert abutilon, indian mallow.

Below center: *Anisacanthus* species, desert honeysuckle.

Below right: *Ambrosia deltoidea*, triangle leaf bursage.

Below: *Alyogyne huegelii*, blue hibiscus.





Above left: *Caesalpinia mexicana*, Mexican bird of paradise.

Above right: *Atriplex canescens*, fourwing saltbush.

Above: *Buddleia marrubifolia*, woolly butterfly bush.

tubular, nectar-filled flowers of both species. Plants are semideciduous and excellent for wildlife habitats. Plants grow 3 to 5 feet high and as wide with a natural, open form. Cut plants back to 12 inches in late winter for renewed growth in spring. Well-drained soil is necessary.

Anisacanthus quadrifidus var. *brevifolius* ‘Mexican Fire’™ and *A. quadrifidus* var. *wrightii* ‘Mexican Flame’™ are grown for their abundant orange flower clusters. Most flowering occurs midsummer until frost. Both are hardy to 10°F. Parents are native to Chihuahuan Desert.

A. thurberi produces orange or yellow tubular flowers that bloom in spring and summer. Hardy to 20°F. Native to Arizona and New Mexico.

Atriplex canescens
FOURWING SALTBUCH



This plant is a “must” for the wildlife garden. Birds, especially native quail, appreciate the dense cover and edible seeds it provides. Silvery blue-green, evergreen leaves are actually covered with microscopic plates of white wax, which helps the plant conserve water. Plants reach 4 to 8 feet high and as wide. Clusters of inconspicuous yellow flowers bloom in summer,

and are followed by golden fruit pods with four wings on them. Well adapted to salty conditions, and effective for erosion control. Native to western North America.

Buddleia marrubifolia
WOOLLY BUTTERFLY BUSH



Useful as a backdrop to perennial beds, the small, ball-shaped, yellow and orange flowers attract butterflies in summer. Grows to 5 feet high and as wide. The toothed, silvery gray, woolly leaves blend and contrast well with silver or green leaved plants such as brittlebush, lavender, red salvia and bougainvillea. Plant in soil with good drainage. Prune in late winter to control or renew plants. Native to the Chihuahuan Desert in Mexico.

Buxus microphylla
var. *japonica*
JAPANESE BOXWOOD



Boxwood grows to 6 feet high and as wide with a rounded form. It accepts shearing and is a favorite hedge or topiary plant. Leaves are small, round-tipped, bright green and have a musky odor. Accepts sun to partial shade. Native to Japan.

‘Nana’ is evergreen and compact 2 to 4 feet high.

Caesalpinia species

BIRD OF PARADISE

These are tropical plants with bright green, feathery foliage. Leaves and branches can suffer frost damage below 30°F. The roots can tolerate temperatures into at least the upper teens. If healthy before a freeze, plants recover rapidly in spring, growing back bushier than ever. Wait until danger of frost has past in spring before pruning damaged branches.

Caesalpinia gilliesii

YELLOW BIRD OF PARADISE



Grows 6 feet high, with an equal spread. Foliage is sparse and feathery, with a growth habit that can become top heavy. Spikes of large, brilliant yellow flowers with showy red stamens are the payoff for growing this plant. Best used as a background behind smaller, fuller plants to hide the bare lower stems. Provides color late spring to fall. Accepts shade. Tolerant of almost any soil. Native to Argentina.

Caesalpinia mexicana

MEXICAN BIRD OF PARADISE



This yellow-flowering species has recently become available. It grows rapidly to 10

feet high and as wide. The bloom season comes on slightly later than red bird of paradise, and lasts later in the year. Foliage freezes at 28°F to 30°F, but healthy plants recover from the roots. Accepts some shade. Native to Mexico.

Caesalpinia pulcherrima

RED BIRD OF PARADISE



Brilliant red and yellow flowers bloom from early summer to fall. A splendid workhorse plant for the Coachella Valley. Typically grows 5 to 8 feet high, with fine-textured, almost luxuriant leaves, but can get much larger in mild climates. Due to its stature and deciduous nature, use as a background plant. Accepts almost any soil but full sun is required. Cut stems back to about 18 inches after winter dormancy, prior to new spring growth. Native to the West Indies.

Calliandra californica

BAJA FAIRY DUSTER



The refined, dark green foliage of Baja fairy duster is attractive when combined with other natives or subtropical plants. It grows to 6 feet high and 4 to 5 feet wide with an open form. Red puffball flowers with long stamens bloom spring into fall; attracting hummingbirds. Prune lightly in

Below left: *Caesalpinia pulcherrima*, red bird of paradise.

Below right: *Calliandra californica*, Baja fairy duster.

Below: *Caesalpinia gilliesii*, yellow bird of paradise.





Above left: *Calliandra eriophylla*, fairy duster.

Above right: *Callistemon viminalis* ‘Little John’, little John bottlebrush.

Above: *Calliandra haematocephala*, pink powder puff.

late spring to encourage a fuller plant from the ground up. If growth becomes excessive, decrease water. Plant in soil with good drainage. Native to Baja California.

Calliandra eriophylla   10°
FAIRY DUSTER

Produces pinkish red flower clusters in the spring, complemented nicely by its refined foliage. Mature height and spread is 2 to 3 feet. Similar to *Calliandra californica*, but its growth habit is typically more controlled. Graceful and airy, it is ideal in a natural garden design. Pruning back branches slightly may help create more fullness. Allow plants to grow naturally and they will produce more flowers. A low water-use plant that prefers full sun and well drained soil. Native to Sonoran and Chihuahuan Deserts.

Calliandra haematocephala   30°
PINK POWDER PUFF

A desirable, hospitable evergreen for an unusual accent planting or trained along a wall. Accepts some shade. Grows in a sprawling form to 10 feet high and as

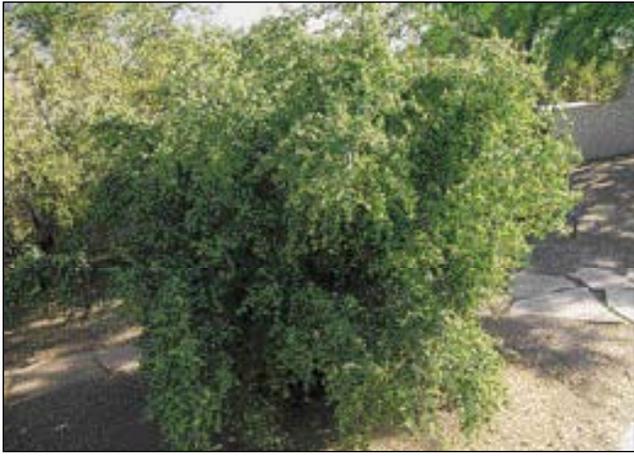
wide. In winter, a profusion of bright, red-pink stamens shaped like huge powder puffs contrast with rich green, compound leaves. Attracts hummingbirds. Plant in well-drained soil. Native to Bolivia.

Callistemon viminalis   26°
‘Little John’
LITTLE JOHN BOTTLEBRUSH

The species *Callistemon viminalis*, described on page 50, is a commonly grown tree. ‘Little John’ is an attractive shrub to 3 feet high and as wide. The narrow, light green leaves grow up to 6 inches long. Profuse numbers of red bottlebrush flowers bloom fall into spring. They attract butterflies and hummingbirds. Acidify the soil on a quarterly schedule to prevent chlorosis and to encourage more flowers. A hybrid of Australian parents.

Carissa grandiflora   26°
NATAL PLUM

(*C. macrocarpa*). This commonly grown shrub reaches up to 7 feet high and as wide. Leaves are an intense deep green, densely arranged on unique, tight, short branches.



Makes a suitable hedge but spines can be a hazard. Protect from frost by locating in a warm microclimate such as the south side of a building under a wide overhang. It accepts some shade. Fragrant white flowers are followed by red or purple fruit—as long as plants are not pruned excessively. Native to South Africa.

‘Boxwood Beauty’ has a compact, shrubby form, growing to 2 feet high. ‘Fancy’ has outstanding fruiting qualities and boldly branching, upright growth to 6 feet high. ‘Green Carpet’ has dense growth to 1-1/2 feet high. Its spreading habit makes it exceptionally good as a ground cover. Foliage is lush and resembles a carpet of green. ‘Tuttlei’ has a more upright form to 2 to 3 feet high. It has a spreading, tight-branching growth habit enhanced by its rich green foliage.

Celtis pallida

DESERT HACKBERRY



From a distance, the overall impact of this shrub is a dense, medium green, rounded form to 8 feet high and 10 feet wide. Up close, the spines reveal themselves. Fragrant yellow flowers bloom in spring,

followed by orange berries in fall. The dense growth and spines, combined with highly edible berries, make this a favorite nesting place for many desert birds. In the landscape, desert hackberry makes a wonderful informal hedge, screen or ideal backdrop for showier plants. It can also be used for erosion control. Extra water in spring and summer promotes more flowers and fall fruit. Native to sandy soil locations from west Texas into Arizona.

Cleome isomeris

BLADDERBUSH



(*Isomeris arborea*). This 4- to 6-foot shrub has light green foliage and bright yellow, snapdragonlike flowers borne in clusters at the tips of branches. Flowers are a great source of nectar for bees and hummingbirds. After flowers complete bloom, inflated green capsules develop with seeds inside. Plants blend well with *Encelia farinosa*, *Aniscanthus* species and *Salvia greggii*. Easy to grow from seed sown directly in place. Well-drained soil is important. Avoid overwatering during its summer dormancy. Native to the western Mojave Desert.

Above left: *Celtis pallida*, desert hackberry.

Below left: *Carissa grandiflora* Tuttlei, natal plum.

Above: *Cleome isomeris*, bladderbush.

Below left: *Cordia boissieri*, Texas olive.
 Below right: *Cordia parvifolia*, little-leaf cordia.
 Below: *Cuphea llavea*, bat-faced cuphea.



Cocculus laurifolius
 LAUREL-LEAF COCCULUS   26°
 Glistening leathery leaves to 6 inches long on graceful, arching branches make this upright, evergreen shrub a desirable addition to the landscape. Develops slowly to 25 feet high. Accepts pruning well. Good cut foliage for arrangements. Accepts some sun but better with eastern exposure (afternoon shade) or in partial shade beneath canopy trees. Native to Himalayas.

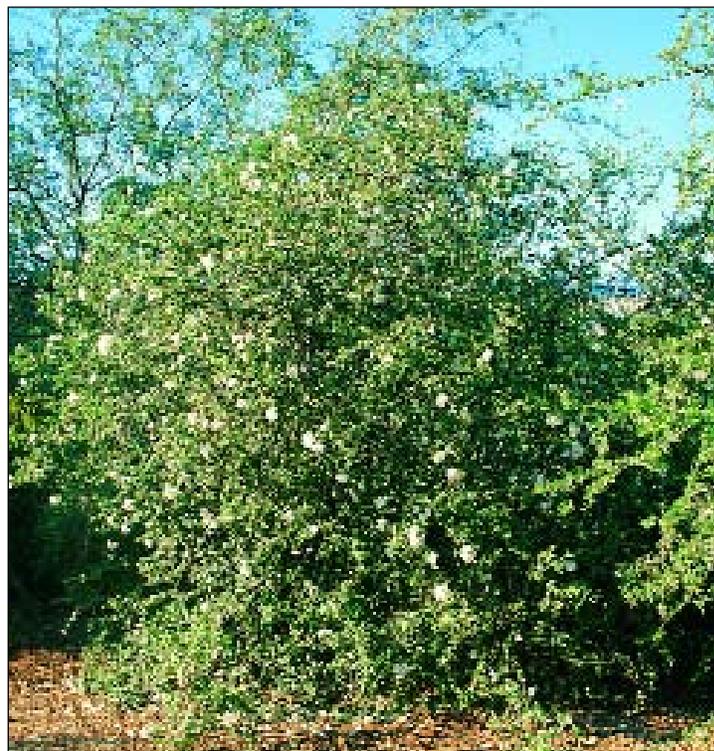
Cordia boissieri
 TEXAS OLIVE   20°
 This superior shrub has blue-green, leathery leaves and clusters of white flowers to 2-1/2 inches wide. Grows 10 to 12 feet high and spreads to 10 feet wide. Generally a warm-season bloomer, however, flowering extends into winter in the mild climate of the Coachella Valley. Accepts partial shade. Prefers well-drained soil. Remove dead interior branches and lower branches for a small tree form. Native to Mexico and the Rio Grande Valley in Texas.

Cordia parvifolia, little leaf cordia, is similar to *C. boissieri* but smaller in stature and texture with smaller leaves and white flowers 1 to 1-1/2 inches across.

Plants grow 4 to 6 feet high with a similar spread. Form is more open and airy. They can become cold-deciduous below 20°F.

Cuphea hyssopifolia
 FALSE HEATHER, MEXICAN HEATHER   28°
 A compact shrub to 2 feet high and as wide. The tiny, bright green, needlelike leaves look similar to true heather. Small, starlike flowers in pink, purple or white appear for most of the warm season. Often grown as a seasonal hanging basket, it does better planted in the ground where roots appreciate the cooler temperatures. Plant in well-drained soil. Native to southern Mexico and Guatemala.

Cuphea llavea
 BAT-FACED CUPHEA   20°
 Small shrub to 2 feet high and 3 feet wide with crisp, dark green foliage. Blooms spring, summer and fall. Unusual red flowers with purple centers remind one of a bat's face. Provide ample water during warm months, particularly if plants are located in full sun. Best with afternoon shade in the Coachella Valley. A longer-lived alternative to annuals in flowerbeds. Native to Mexico.



Cycas revoluta

SAGO PALM



(*Cycas ehrenbergia*). A dwarf and compact, palmlike plant, with many, long, shining, dark green leaves. The leaves appear as if they've been waxed, growing as a crown on top of the short trunk. The thick, heavy stem in small plants resembles a pineapple. Makes a splendid specimen container plant or include in a grouping of similarly sized palms. Reaches choice height of 6 to 10 feet high and 6 feet wide, but grows very slowly. Locate where plants receive partial filtered shade; protect first year with shade cloth to keep direct sun off plant. Native to Japan.

Dalea frutescens

BLACK DALEA



One of the many valuable *Dalea* species. Compact to 3 feet high and 4 feet wide. Expect partial leaf drop in extreme cold or during drought. Rose-purple flowers put on a show in fall and winter when most plants have ceased blooming. Lightly prune, maintaining natural form, in spring. Plant in well-drained soil. 'Sierra Negra' has more prolific blooms. Native to Chihuahuan Desert.

Dalea pulchra

INDIGO BUSH,
BUSH DALEA



This shrub has contrasting, intertwining, silvery gray leaves with violet-blue flowers from late winter into spring. Grows 3 to 5 feet high and up to 4 feet wide. Adds great interest when combined with other native desert plants. Best in full sun and in well-drained soil. Native to Arizona and northern Sonora, Mexico.

Dodonaea viscosa

HOP BUSH



A ruggedly handsome substitute for oleander, or wherever you need a vigorous, fast-growing shrub or screen. Reaches 10 to 12 feet high and almost as wide, with bright green, evergreen leaves. Suitable as low windbreak or for screening. Space 4 to 5 feet apart. Will accept some shade, and stands up to wind, heat and cold. Flowers are inconspicuous but are followed by showy, pale yellow seed pods that split and blow away—low litter. Lightly shape plants (avoid shearing), or allow them to develop their natural form. Native to Arizona.

'Purpurea', purple hop bush, has bronzy purple leaves and is less hardy—to 20°F.

Below left: *Dodonaea viscosa*, hop bush.

Below center: *Dalea pulchra*, indigo bush.

Below right: *Dalea frutescens*, black dalea.

Below: *Cycas revoluta*, sago palm.



Below left: *Eremophila maculata* v. *brevifolia*, red eremophila.

Below right: *Ericameria laricifolia*, turpentine bush.

Below: *Encelia farinosa*, brittlebush.

Encelia farinosa

BRITTLEBUSH, INCIENSO



Brittlebush is an abundant shrub in natural desert areas throughout the Sonoran and Mojave Deserts. It plays a versatile role in home gardens, particularly in natural designs with other native plants. Evergreen gray to light green leaves are soft and velvety to the touch, covering the 2- to 3-foot plants. Bright, yellow, daisylike flowers are borne on tall stems in profuse numbers well above the foliage in spring. After flowering has passed, cut plant back by one-third and water thoroughly for a repeat bloom. Little is required to grow them successfully: well-drained soil, low water and full sun. Does not need fertilizer. May die back to the ground during periods of drought, but generally comes back with moisture.

Eremophila maculata v. *brevifolia*

RED EREMOPHILA



An excellent choice for bright winter color. The dark gray leaves are virtually hidden by the brilliant red flowers January into March. The rest of the year, the symmetrical, 4- by 4-foot, dark gray shrub blends with other silvery foliaged plants. Grows moderately fast and prefers well drained soils. Shear plants in April after blooming, but then not again if you want ideal bloom display.

Also try *Eremophila* 'Summertime Blue' for its lilac-blue flowers during summer. It also has an ability to grow in clay soils. Both are native to Australia.

Ericameria laricifolia

TURPENTINE BUSH



In the fall, the dense, fine-textured, dark green leaves of turpentine bush become



blanketed with bright yellow, daisylike flowers. The refined growth can develop into a shrub 2 to 3 feet high and as wide. Best used in masses or groups in out-of-the-way places, on slopes or in combination with other low-water use plants. Give the foliage a rub between your hands and you will smell the turpentine scent. Native to west Texas, New Mexico, Arizona and Mexico.

Eriogonum fasciculatum
v. *poliofolium*

FLATTOP BUCKWHEAT



A low, rounded, evergreen shrub to 1 1/2 feet high, spreading to 2 feet wide. Leaves are extremely fine textured—dark gray-green above, white and woolly below. This delicate foliage is virtually hidden in spring by 2-inch clusters of tiny white to pale pink flowers. Flowering begins in March and can continue into November if plants receive regular water. Seeds are loved by the lesser goldfinch and other birds. Pruning generally isn't necessary. Does best in well drained soils—it is native to dry rocky slopes of southeastern California, and into Arizona and Nevada.

Euonymus japonicus

EUONYMUS



Fast-growing, upright shrub from 8 to 12 feet high with large, shiny, deep green leaves. Needs regular moisture to maintain healthy, overall lush and vigorous appearance. Compact branching habit accepts shearing well. Native to Japan.

'Aureo-variegata', gold spot euonymus, grows to 10 feet high and 6 feet wide. It has leaves blotched with yellow and well-defined, dark green margins. Best in partial shade. 'Microphyllus Improved', boxleaf euonymus, is a dwarf selection 1 to 2 feet high. It is erect but compact with small, closely arranged, dark green leaves. Formal appearance that does not require pruning. Locate in full sun or partial shade.

Fallugia paradoxa

APACHE PLUME



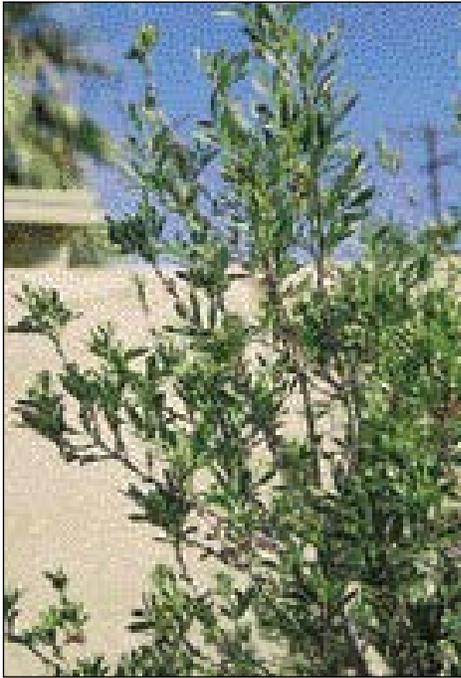
Apache plume grows 3 to 6 feet high and as wide. Admired for its graceful, airy, upright, angular branches covered with dark green leaves, as well as its flowers and seed heads. Flowers are 1 inch across and look similar to single rose blossoms. Seed heads that are silky pink plumes adorn plants from May to December. Adds

Below left: *Eriogonum fasciculatum*

v. *poliofolium*, flattop buckwheat.

Below: *Fallugia paradoxa*, Apache plume.





Above: *Fraxinus greggii*,
little leaf ash.

Above right: *Guaiacum
coulteri*, guayacan.

long-term interest throughout the landscape. Deciduous in cold winters. Locate in full sun to partial shade. Well-drained soil essential. Native range extends from Utah to Texas south to Mexico.

Feijoa sellowiana   15°
PINEAPPLE GUAVA

This is a fast growing, evergreen shrub, reaching 10 to 18 feet high. Gray-green leaves are attractive, as are the waxy white flowers with red stamens. Flower petals are edible and can be used in salads. Flowers bloom May through June and are followed by tasty fruit. Fruit quality and quantity is better in cooler climates, and when fruit-producing cultivars are grown. Accepts some shade. Native to South America.

Fraxinus greggii   10°
LITTLE LEAF ASH

Grows at a moderate rate to 10 feet high and up to 8 feet wide. Leaves are light green to gray-green; bark is gray. Can be trained to become a small tree with rounded head. Tolerates heat, alkaline soils and lawn situations. Native to canyon bottoms and steam sides, so does best with regular water. Inconspicuous spring flowers are pollinated by the wind. Ash are in the same family as olives, and their pollen is troublesome for some. Native from Arizona to Texas.

Gardenia jasminoides   20°
GARDENIA

(*Gardenia angusta*). Evergreen shrub 3 to 4 feet high and as wide, grown for its famous, large, creamy white and extremely fragrant flowers. The flowers, framed by glossy green leaves, bloom April to October. Apply acidifying fertilizer monthly from March to September for best results. Good soil drainage is required. Prefers partial shade. Suited to containers. Native to China, Taiwan and Japan.

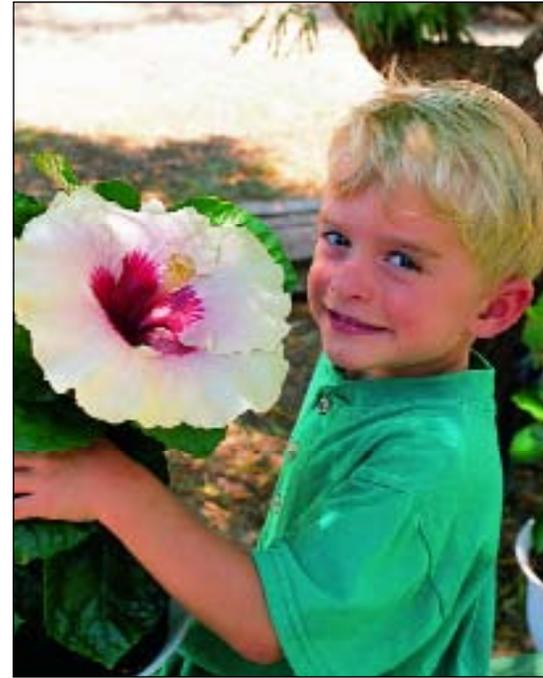
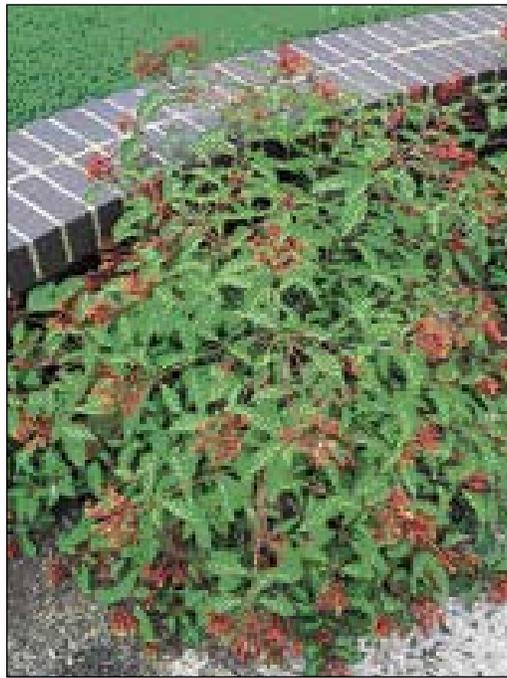
'Mystery' is bushy and compact to 5 feet high. 'Veitchi', everblooming gardenia, is free-flowering, compact and upright to 3 feet high.

Grewia occidentalis   26°
LAVENDER STAR FLOWER

Fast-growing, evergreen shrub to 6 feet high, spreading 4 to 5 feet wide. Dark green, 3-inch-long leaves serve as an excellent backdrop to the lavender, star-shaped flowers that bloom late spring into fall. Tolerates wind. Do any major pruning in fall after bloom ceases. Accepts training as an espalier. Native to southern Africa.

Guaiacum coulteri   25°
GUAYACAN

Intense, blue-purple flowers offer a startling splash of color against the rich, dark green foliage. Flowers appear in spring



and can last into midsummer if plants are given a little extra water. The leaves are composed of 6 to 10 tiny leaflets and are borne on twisted, crooked branches covered with smooth, pale gray bark. Prefers well drained soil. Accepts some shade. Susceptible to hard frosts, growing at a moderate rate to 6 feet high and as wide. In frost-free areas it can reach up to 10 feet high. Native to tropical deciduous thorn scrub of western Mexico.

Hamelia patens
SCARLET BUSH,
FIRE BUSH



This fast growing shrub has fuzzy, 6-inch, gray-green leaves. In areas with frost, plants reach 5 feet high and as wide, but often remain smaller. In frost-free areas in the tropics they can reach an incredible 25 feet. Clusters of orange-red, 3/4-inch tubular flowers bloom through summer with regular moisture. Flowers are followed by small dark fruit that are relished by birds. Needs good soil drainage, but tolerant of saline soils. Accepts some shade, but protect from wind and frost. Prune in fall after flowering has ceased. Native to southern Florida and Central America.

Hibiscus rosa-sinensis
HIBISCUS



These subtropical flowering shrubs grow

6 to 10 feet high, and bloom continuously during the warm season. Foliage varies but most have attractive, glossy, deep green leaves. Flowers come in a wide range of colors; many are multicolored with contrasting throats. Well-drained soils are a must. Locate plants where they'll receive afternoon shade and wind protection. Prune in early spring, and pinch spent flowers through the flowering season to encourage more blooms. Hardy to 28°F to 40°F, depending on variety. Native to tropical areas around the world.

Some common cultivars include: 'Agnes Gault'—large, single, bright, rose-pink flowers that are heavily veined with a pink and cranberry throat. Fast-growing, vigorous plant. Prune to prevent legginess. 'Butterfly'—vibrant, bright yellow, single flowers are produced in profusion on slow-growing, upright plants. 'Crown of Bohemia'—very full double flowers are magnificent golden yellow with deep orange-red throats, on upright plants to 5 feet high. 'High Voltage'—large white flowers with contrasting magenta throats. 'Ross Estey'—extremely large single flowers with orange edges shading to glowing rose center. The ruffled and tufted flowers last about three days on plants. Vigorous growth to 8 feet high. 'San Diego Red'—vivid, bright red single flowers in profuse numbers most of the year. 'White



Above left: *Feijoa sellowiana*, pineapple guava.

Above center: *Hamelia patens*, scarlet bush.

Above right: *Hibiscus* 'High Voltage'.

Above: *Hibiscus* 'Agnes Gault'.

Below right: *Justicia spicigera*, Mexican honeysuckle.

Below center: *Juniperus chinensis* ÓTorulosaÖ, Hollywood juniper.

Below: *Hyptis emoryi*, desert lavender.

Wings’—heavy crop of attractive single flowers. White petals have a ruby eye in the center accented with a faint red vein in each petal. A vigorous plant, prune to control legginess.

Hyptis emoryi
DESERT LAVENDER



The wonderful lavender fragrance of all parts of this shrub make it an excellent addition to any garden. The powder gray foliage contrasts well with clusters of small violet-purple flowers that grace the bushes from spring through fall. They cling, dried on the stems, through the winter. Becomes an open, upright, vase-shaped, evergreen shrub, reaching 5 to 8 feet high, eventually spreading as wide. Plants are winter dormant, and require no water during this season. Plant in the background for an excellent backdrop to perennials, wildflowers or other color plants. Does best in well drained soil. Native to Sonoran Desert.

Ilex vomitoria
‘Stokes Dwarf’



DWARF YAUPON

Tiny, rich, dark green leaves are closely held on a dwarf plant from 2 to 3 feet

high. Tolerates alkaline soils better than other hollies. Use as a border or low hedge. Accepts some shade. Native to southeastern United States.

Juniperus chinensis



JUNIPER

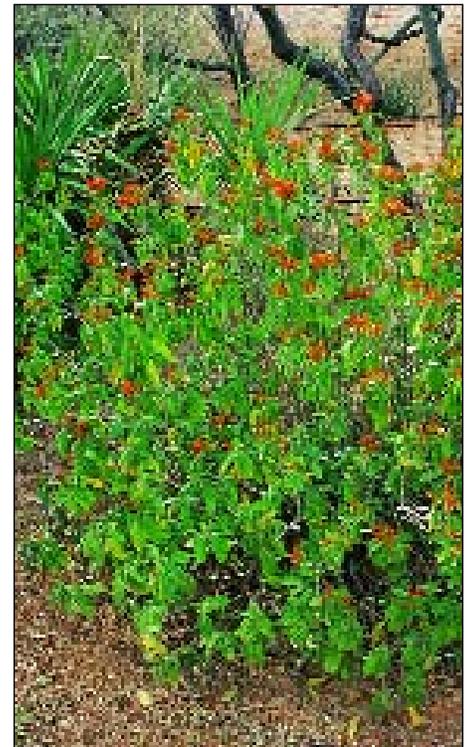
Junipers are available in many different sizes, forms, growth habits and foliage colors. Research carefully to get the plants you want to fit your use and site. Some will accept partial shade.

‘Armstrongii’, Armstrong juniper, is a showy, compact, semi-erect conifer from 4 to 5 feet high. Symmetrical with a close-knit growth habit. Attractive, medium green, lacy-textured foliage.

‘Hetzii Columnaris’, a columnar juniper, is an attractive, bright green shrub, growing as a dense, 12- to 15-foot column. Sharp-pointed, needlelike leaves accept trimming well.

‘Pfitzeriana’, Pfitzer juniper, has handsome, gray-green foliage. Sharp-needled leaves cover arching branches as plant develops into a showy, spreading shrub 6 to 10 feet high and as wide. Its form creates a natural security barrier that is difficult to penetrate.

‘San Jose’ is one of the best prostrate





(low-growing) junipers. Dark sage green foliage with a compact growth habit to 2 feet high, spreading to 6 feet wide. It becomes a husky presence with many branches. Locate in partial shade. Excellent specimen for tub or bonsai.

‘Torulosa’, also known as ‘Kaizuka’, Hollywood juniper, has rich green foliage. Form is upright from 10 to 15 feet high. Erect branches take on a picturesque, wind-blown appearance. Best in partial shade. Handsome shrub for use along fences or as an accent.

Justicia brandegeana
SHRIMP PLANT



(*Beloperone guttata*). Masses of pinkish copper, shrimp-shaped bracts, modified leaves, surround small white flowers set off by evergreen, apple green leaves. Plants grow 2 to 3 feet high and as wide, blooming during the warm season. Best in partial shade. Good for a tropical effect. Can be planted in containers. Cut cold-damaged plants back in early spring to rejuvenate them. Native to Mexico, it has escaped and naturalized in southern Florida.

Justicia californica
CHUPAROSA



Showy, red, tubular flowers are most profuse in the spring, with sporadic flowers in summer and fall. Sprawling, informal

growth to 4 feet high, spreading to 6 feet wide, with small, pale green leaves. Ideal for a hummingbird garden or a natural garden design. Cut plants back severely in early spring every two or three years to reinvigorate growth. A yellow-flowering form is also available. Native to the Sonoran Desert.

Justicia spicigera

MEXICAN HONEYSUCKLE



Vivid, orange, tubular flowers combine with soft, fuzzy, pale green leaves, creating a luxuriant effect. Hummingbirds flock to plants when in bloom in mid- to late spring, and into fall with regular water. Growth is rounded to upright to 4 feet high. Usually no insect or disease problems. Tolerates some sun, but grows best in filtered shade, such as beneath high-canopied trees. Native to southern Mexico and into Central America.

Lantana camara

LANTANA



Evergreen shrub or ground cover. Produces masses of color during the warm season, blending with native or introduced dry-climate plants. Rich green leaves cover the thickly branched plants. Cut plants back severely in early spring every two or three years to renew growth. Native to tropical America.

Above left: *Justicia brandegeana*, shrimp plant.

Above: *Justicia californica*, chuparosa.

Below right: *Lantana camara*, lantana.
 Below center: *Lantana camara* 'New Gold'.
 Below left and below: *Larrea tridentata*, creosote bush.

Many outstanding selections are available: 'Christine', striking cerise-pink flowers; 'Cream Carpet', cream-colored flowers; 'Dwarf White', velvety white flowers; 'Dwarf Yellow', bright yellow flowers; 'New Gold', golden yellow flowers; 'Radiation', rich, orange-red flowers; 'Spreading Sunset' with vivid, orange-red flowers; 'Spreading Sunshine', abundant, bright yellow flowers create a blanket of color on low, spreading compact plants; 'Tangerine', produces blooms that have a true, solid tangerine color.

Larrea tridentata
 CREOSOTE BUSH



(*L. divaricata*). This characteristic shrub of the desert can be seen in abundance throughout low- and high-elevation regions of the desert Southwest. The fresh, clean scent this plant produces after a rain is unique, and treasured by desert dwellers. It is one of the most versatile shrubs for a natural garden design, accepting the toughest conditions of intense heat, sun, wind, cold and drought. The olive green, glossy, evergreen foliage can be most useful as a hedge or screen or individual specimen. Creosote is truly maintenance-free. Bees are attracted to small yellow flowers that cover the 5- to 12-foot plants in spring.

To help plants develop deep tap roots,

provide new plantings with deep irrigation, but allow the soil to dry between applications. If you have inherited creosote bush on your property, an occasional deep irrigation will cause plants to produce more luxuriant growth. Light pruning may be necessary if plants become scraggly.

Leucophyllum species TEXAS RANGER

This genus of flowering shrubs have become star performers in Southwest landscapes. More than a dozen species and selections are available and adapted to a large region, from Texas to California. Plants come in a range of sizes and have evergreen, silvery gray to green foliage and dense, well-rounded growth. Low water use, acceptance of full sun and long flowering seasons are more than enough attributes to use them in abundance in most any garden situation. Each species has a unique value that makes it worthy of consideration. Native to the Chihuahuan Desert, most selections are generally cold hardy to 10°F and have few problems caused by insects or diseases. Good soil drainage is important; avoid overwatering.



Allowed to grow naturally, plants take on an informal appearance. Controlling growth by trimming creates a more dense, hedgelike appearance, but usually results in fewer flowers and higher water use. Avoid pruning in globes or squares. Prune lightly in fall after the flowering season has finished to maintain the plant's form and for a more natural but controlled effect.

Leucophyllum candidum

VIOLET SILVERLEAF



Plants found in Texas were brought to the nursery trade due to the gorgeous silvery foliage and smaller stature (3 feet high and wide) compared to other *Leucophyllum* species. Flowers are deep violet, striking in contrast against the silver leaves. Most prolific bloom comes in late summer.

'Silver Cloud' has striking, dark violet flowers, excellent in contrast to its silvery, almost white foliage. It is larger than 'Thunder Cloud' but produces fewer flowers. 'Thunder Cloud' grows to 2 feet high with indigo flowers.

Leucophyllum frutescens

TEXAS RANGER



This is the species that was the first *Leucophyllum* to be brought into cultiva-

tion. It grows 6 to 8 feet high and as wide with a slightly rangy, open growth habit. Becomes an excellent screening hedge, and an alternative to oleander. Rose-purple flowers bloom most profusely in midsummer against a backdrop of blue-gray leaves. Native to Texas into Mexico.

'Compacta' develops into a dwarf shrub 3 to 4 feet high. 'Green Cloud' has light green foliage; 'White Cloud' produces gray foliage and white flowers. 'Rain Cloud' is a cross between *L. frutescens* and *L. minus*. Foliage is similar to *L. frutescens* but flowers are a brilliant shade of violet-blue.

Leucophyllum laevigatum

CHIHUAHUAN RAIN SAGE



Grows to 4 feet high and as wide or wider with light violet flowers that bloom during summer, especially with humidity. Small, wavy, medium green leaves cover the branches, which turn up at the ends. Native to canyon bottoms in the Chihuahuan Desert.

Leucophyllum langmaniae

CINNAMON SAGE



Grows to 5 feet high and as wide with leaves that are similar to Chihuahuan

Below left:
Leucophyllum frutescens, Texas ranger.

Below center:
Leucophyllum candidum
◊White Cloud◊.

Below right:
Leucophyllum frutescens
◊Green Cloud◊.

Below: *Leucophyllum candidum*
◊Silver Cloud◊.





Above right: *Leucophyllum laevigatum*, Chihuahuan rain sage.
Above: *Leucophyllum langmaniae* Rio Bravo.

rain sage but plants have a denser form. Flowers are violet and appear through the summer. ‘Rio Bravo’ has improved flowering performance. Native to Chihuahuan Desert.

tently through the warm season.

‘Blue Ranger’ features flowers that are a darker, blue-violet hue. ‘Cimmaron’, with light blue flowers, becomes a compact shrub 3 to 4 feet high and as wide. Native to southwest U.S. into Mexico.

Leucophyllum prinosum

SIERRA RANGER



A charming plant with silvery white leaves and deep purple flowers that are the most fragrant of the Texas rangers. Grows to 6 feet high with an equal spread, making it an excellent background plant or screening hedge.

‘Sierra Bouquet’ is an especially striking and fragrant plant—its flowers smell like grape bubblegum. Native to the Chihuahuan Desert.

Leucophyllum zygophyllum

BLUE RANGER



Grows slowly to 4 feet high and as wide with a naturally rounded form. Leaves are a silvery blue-green and are distinctive in that they cup upward. Light blue-violet flowers are attractive and appear intermit-

Ligustrum japonicum

JAPANESE PRIVET,
WAXLEAF PRIVET



(*L. texanum*). Fast growing, evergreen shrub or small tree 8 to 12 feet high and as wide. Dark green, lustrous leaves on heavily branched, upright habit. Clusters of white flowers bloom in spring. Can be sheared into topiary forms, also makes a wonderful hedge or screen. Avoid full sun situations because leaves are subject to sunburn. Native to Japan and Korea.

Maytenus phyllanthoides

MANGLE DULCE



This large evergreen shrub forms a dense, lush screen with minimal care or effort. Grows at a slow to moderate rate to 10 feet high with an equal spread. Bright green, leathery leaves are rounded and fleshy, and



are attractive all year long. Inconspicuous spring flowers are followed by small red fruit that add a dash of color, and are enjoyed by birds. Accepts some shade. Plants are native to salty soil regions of coastal Texas and Baja.

Murraya paniculata
ORANGE JESSAMINE



Luxuriant, bright, glossy green leaves and waxy, pure white flowers bloom April to July. They perfume the air with an intense, orange blossom fragrance. Makes an attractive evergreen hedge or screen 6 to 12 feet high. May take on a tree form ranging to 20 to 25 feet with time, if not pruned. Best appearance if given some shade but tolerates full sun with ample water. Native to southeast Asia.

Myrtus communis
TRUE MYRTLE



Grown for its aromatic, dark green, glossy leaves, this shrub has white flowers in the spring and summer, followed by dark blue berries. Ideal hedging plant and natural foundation plant to 10 feet high, it also accepts shaping well. Accepts some shade.

Native to the eastern Mediterranean.

‘Compacta’, dwarf myrtle, has smaller leaves and a more compact growth habit to 3 to 4 feet high—ideal for low hedging or foreground planting.

Nandina domestica
HEAVENLY BAMBOO



This compact, evergreen shrub grows 5 to 8 feet high. It is a highly versatile plant for small areas. Appearance is bamboo-like, with many vertical stems that display distinctive, lacy green leaves. Foliage may turn brilliant shades of red and orange in fall, depending on extent of exposure to sun and cold. Red berries in winter are also an attraction. Great decorative value in containers. Best with eastern or northern exposure; don't plant on the sunny west side. As plants age, remove old stems to renew growth, otherwise little maintenance required. Dwarf selections are available. Native to India and east Asia.

Nerium oleander
OLEANDER



Oleander has long been a workhorse plant in the Coachella Valley, useful as wind-

Top left: *Myrtus communis*, true myrtle.

Left: *Maytenus phyllanthoides*, mangle dulce.

Above: *Nandina domestica*, heavenly bamboo.



Above right: *Perovskia atriplicifolia*, Russian sage.
 Above left: *Nerium oleander*, oleander.
 Above center: *Phlomis fruticosa*, Jerusalem sage.
 Above: *Plumbago scandens*, white desert plum-bago.

breaks and screens. But oleander leaf scorch—a bacterial disease—and cancer—a bacterial infection—are destroying mature plantings throughout California and the Southwest. Currently, older plants, 20 to 30 years old, are most affected. There is no known cure. At this time it is recommended that other plants be grown.

If you have healthy, existing plantings, continue to maintain them as usual. Prune during warm weather, dipping clippers into a 10 percent bleach solution between cuts. Pruning exposes the interior of the plant to sunlight, stimulating new flowering wood. Do not prune into globes or squares. Avoid shearing, which reduces flowering wood. Note that all plant parts are poisonous so do not burn wood—the resulting smoke may cause irritation.

Perovskia atriplicifolia
 RUSSIAN SAGE



This is an underused plant that blends well with *Rosmarinus*, *Salvia*, *Encelia* and *Ericameria* species. It grows 3 to 4 feet high and as wide. Stems with small, toothed, gray-green leaves are topped with showy spikes of diminutive lavender flowers in the summer. Selections that produce

flowers in different colors are available. Well-drained soil and moderate applications of water help ensure vigorous, healthy growth. Space at least 4 feet apart so they have ample room to reach mature height and spread. Cutting plants back severely in early spring renews growth. Native to eastern Iran and northwest India.

Phlomis fruticosa
 JERUSALEM SAGE



Evergreen perennial subshrub from 2 to 3 feet high and as wide. In spring, clear yellow flowers develop atop stems with whorls of gray, velvety, aromatic leaves. This is a great plant on slopes or combine with other dry-climate plants. Deadhead old flowers for rebloom. Provide good soil drainage and moderate but deep watering. Accepts full sun but prefers afternoon shade. Native to the Mediterranean.

Photinia X fraseri
 PHOTINIA



Evergreen shrub or screen to 6 to 10 feet high. A special attraction is the new leaf growth in spring that is a glistening, coppery red on bright red stems. Foliage eventually turns a medium green. Clusters of white blossoms also put on a spring

show. More mildew resistant than other photinias. Native to eastern Asia.

Pittosporum tobira
MOCK ORANGE, TOBIRA



This evergreen shrub grows 6 to 10 feet high, with glossy green leaves to 4 inches long. Fragrant, white flower clusters bloom in spring. Gradually becomes a vigorous, sturdy, heavily branching foundation shrub. Prefers partial shade location with filtered sunlight, such as beneath a canopy tree. Native to Japan.

‘Wheeler’s Dwarf’ is much more compact to 2 feet high. Dense growth makes it a good choice as a foreground shrub. ‘Variegata’, variegated mock orange, is a combination of light green and white variegated foliage. It features low, compact-branching growth from 4 to 8 feet high.

Plumbago scandens
WHITE DESERT PLUMBAGO



Grows to 3 feet high and as wide, becoming a rambling, vining shrub. Glossy green, evergreen leaves turn red to purple with cold weather. Produces white, tubular flowers from spring into fall, attracting butterflies. Better appearance when provided with afternoon shade, such as in an eastern exposure. Native to southern Arizona and Mexico.

‘Summer Snow’ is an improved selection.

Prunus caroliniana
‘Compacta’



DWARF CHERRY LAUREL
Specially selected strain of Carolina laurel cherry, grown for its tight, compact growth habit. An evergreen, it grows to 4 feet high and as wide with glossy, deep green leaves. Small, creamy white flowers in March are followed by blackish red berries that attract birds. Best with afternoon shade in the Coachella Valley. Does not accept saline or alkaline soils. Hybrid of parents native to southern Appalachia.

Pyracantha crenatoserrata
PYRACANTHA, FIRETHORN



(*P. fortuneana*). A vigorous, thorny, upright shrub to 8 to 12 feet high with dark green leaves. Outstanding landscape interest throughout the year due to its clusters of white spring flowers and large, long-lasting, red berries in winter. Accepts espalier training. Native to China.

Many selections are available. ‘Graberi’ is more erect, with huge clusters of flowers and berries.

Pyracantha X
‘Santa Cruz Prostrata’



PROSTRATE PYRACANTHA
Unique prostrate growth habit allows this pyracantha to be used for ground cover, bank planting or as a low shrub. Grows

Below left: *Photinia X fraseri*, photinia.

Below right: *Pittosporum tobira* ‘Wheeler’s Dwarf’.

Below: *Pyracantha* species, pyracantha.



Below right: *Raphiolepis indica*, indian hawthorn.

Below left: *Salvia clevelandii*, chaparral sage.

Below: *Ruellia peninsularis*, Baja ruellia.

from 2 to 4 feet high and up to 8 feet wide. Evergreen, with attractive, glossy, deep green foliage. Covers itself with masses of white flowers in spring followed by red berries in fall. Prune upright branches to maintain low-growing form.

Raphiolepis indica

INDIAN HAWTHORN



(*Rhaphiolepis indica*). Evergreen shrub 3 to 4 feet high and 5 to 6 feet wide, with a dense, rounded form. From January to April, the dark green leaves are blanketed by magnificent clusters of flowers. Well drained soil is required. Accepts partial shade. Avoid overhead watering in sunny locations. Native to southern China.

Many cultivars are available: 'Ballerina', rosy pink; 'Clara', white; 'Jack Evans', bright pink; Spring RApture, rose-red flowers; 'Springtime', deep pink.

Ruellia brittoniana

RUELLIA



Although dwarf forms are available, the

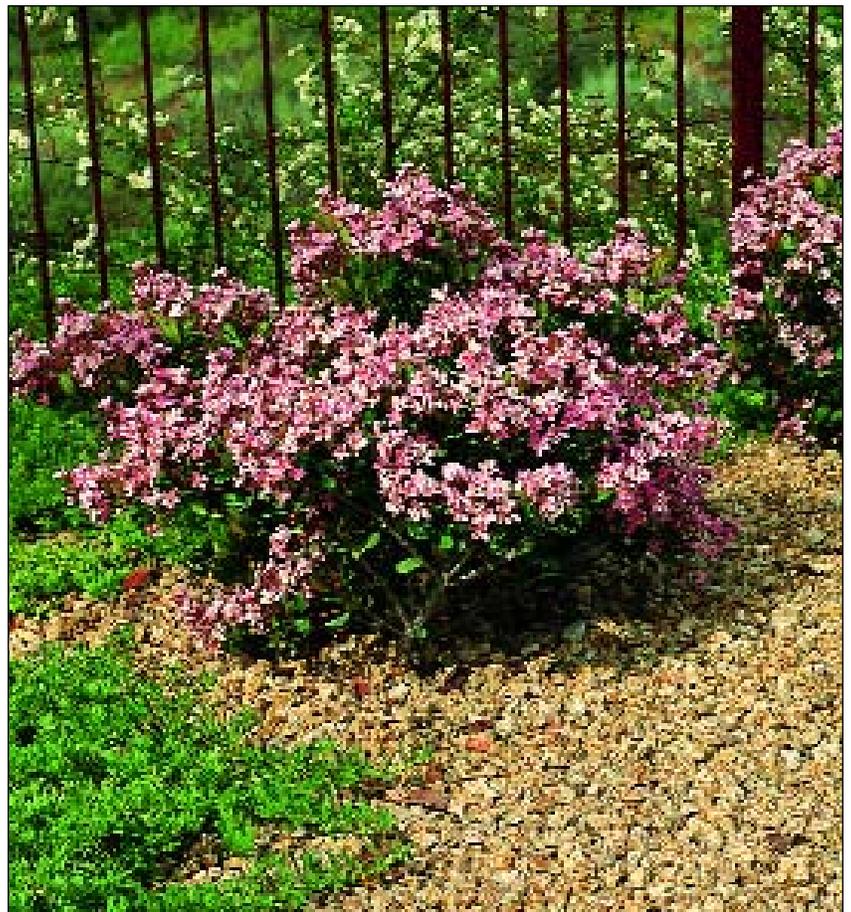
full-size plant is a pleasure to grow, reaching 3 to 4 feet high and spreading at least as wide. Given the room and provided regular water, it can spread to fill a planting bed. The long, bronzy green leaves make a nice backdrop to the purple, trumpet-shaped flowers. Each bloom lasts a single day, but the shrub blooms throughout the warm season. For best appearance, plant where it will receive afternoon shade. Does best in well drained soil, but accepts clay soils. Native to Mexico.

Ruellia peninsularis

BAJA RUELLIA



This is an evergreen shrub growing to 3 feet high, putting out a profusion of purple flowers in late spring and summer. Combine with yellow-flowering *Encelia farinosa* and red-flowering *Salvia greggii* for striking color combinations. Adapts well to heat, wind and reflected sun, which makes it a good poolside plant. Plants seldom need pruning except to thin old growth for renewal.



Salvia species

SALVIA

Salvia is a large genus, with over 900 species world wide. For best results in the Valley, plant species that are adapted to our desert climate.

Hummingbirds love salvias, so desert gardeners are wise to include them in their gardens to attract these fascinating birds. Salvias come in a range of sizes. Some grow as low as 1 foot high, others up to 8 feet. Leaf color varies greatly as well, from silvery white, to olive, to lush deep green. All grow rapidly, and benefit from pruning (cutting back) after flowering has ceased. Select species carefully to suit the space you have available. Here are just a few salvias known to do well in the Valley.

Salvia clevelandii
CHAPARRAL SAGE,
CLEVELAND SAGE



This sage is native to California's rugged coastal chaparral, and is surprisingly well adapted to the tougher climates of desert areas. Most plants reach 4 feet high and

5 feet or more wide. Fragrant blue flowers develop in whorls on stems in spring. Deadhead old flower stems in summer after bloom period has passed to renew growth. Well-drained soil recommended. Accepts some shade. Gray-green foliage blends well with many desert natives, and produces a pleasant, musky fragrance when brushed. Plants sometimes scent the air after a vigorous rain. Recently introduced cultivars featuring different shades of purple flowers are available.

Salvia greggii
AUTUMN SAGE



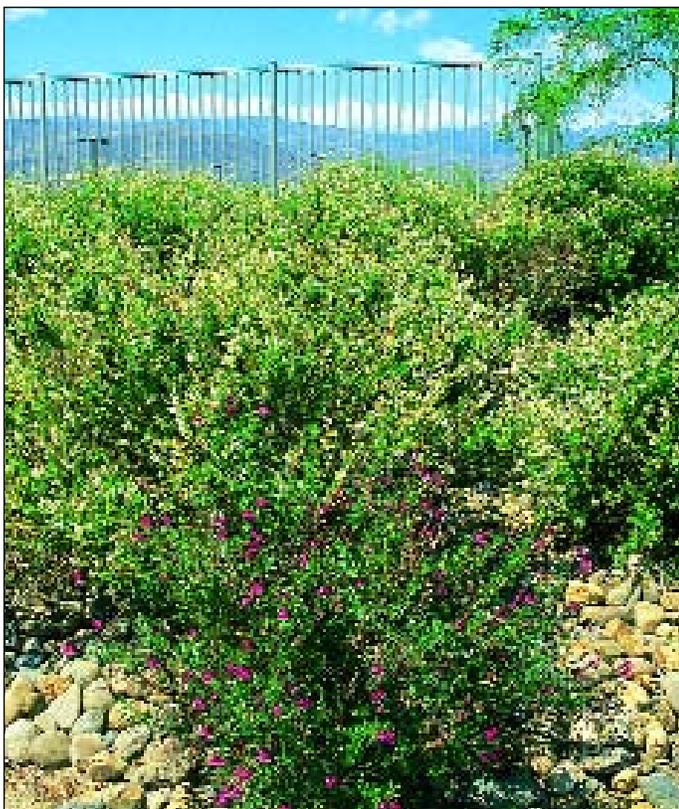
This evergreen subshrub grows 2 to 3 feet high and as wide. Effective when planted in masses, the flower spikes in shades of scarlet-red and magenta attract hummingbirds. Finches enjoy the seeds. Afternoon shade is appreciated in low-elevation deserts. Prune old flowering wood after blooms cease to create new flush of growth. Native to Texas and Mexico.

Many cultivars are available, including 'White', with elongated white flowers; and 'Sierra Linda' (red flowers), which is heat tolerant.

Below left: *Salvia greggii*, autumn sage (white and red selections).

Below right: *Salvia greggii*, autumn sage.

Below: *Ruellia brittoniana*, ruellia.



Below right: *Salvia leucantha*, Mexican bush sage.
 Below center: *Senna artemisioides*, feathery senna.
 Below: *Senna* species, senna.

Salvia leucantha   20°
 MEXICAN BUSH SAGE
 This evergreen shrub grows from 2 to 4 feet high with an often greater spread. Casual, graceful mounding growth habit is well-suited to a natural garden design. Plant in masses for a striking flower displays. Long, slender, velvety purple spikes bloom late summer well into fall, sometimes into winter. Cut back plants after flowering in late winter for fresh growth in spring. Best if given afternoon shade. Native to Mexico.

Senna species

SENNA

(*Cassia*). This group of shrubs are star performers for the arid West, producing yellow fragrant flowers in abundance from late winter into the spring months. They are low water users once they're established, and thrive in full sun. Depending on species, plants grow from 5 to 6 feet high or more, with an equal spread. Foliage color and type varies with each species.

All *Senna* species can be controlled by natural thinning and topping. Remove seed pods after flowering for a neater

appearance. Pods have been used medicinally for eons, but some species are toxic. Plant in well-drained soil. Prune sennas after flowering has passed. This helps remove seed pods and keeps plants in proportion. Note: Many species within this genus were formerly named *Cassia*. Nurseries may carry these plants labeled as *Cassia*.

Senna artemisioides   22°
 FEATHERY SENNA
 (*Cassia artemisioides*). Grows rapidly from 4 to 6 feet high and as wide with an upright, rounded form. Makes a fine background for tall perennials or dwarf shrubs. The evergreen, gray-green, feathery leaves blend perfectly with the yellow flowers that appear late winter and spring. Prune in fall or in cool weather following flowering. Native to Australia.

Senna artemisioides filifolia   15°
 DESERT SENNA
 (*Cassia nemophila*). This variety has greener silvery foliage and is larger than *Senna artemisioides*. Yellow flowers that bloom in late winter and spring are followed by brown seed pods. Grows 4 to



8 feet high with an equal spread. Space 8 to 10 feet apart to allow the plant to grow naturally, which will also yield the most profuse flowers. Remove seed pods with a light natural pruning or knock them off. More hardy to cold than *S. artemisioides*. Native to Australia.

Senna artemisioides
petiolaris

SILVER SENNA



(*Cassia phyllodinea*). Gray-green, sickle-shaped leaves shimmer in the wind. One of the most early flowering sennas, it sometimes begins blooming in December, and often continuing into April. Evergreen, with mature size of 6 feet high with equal spread. Growth is more compact so heavy shearing or pruning is not usually required. Prune when flowering has ceased and while weather is still cool. Native to Australia.

Senna wislizenii
SHRUBBY SENNA



(*Cassia wislizenii*). Stiff, gray-green, 1-inch leaves are winter deciduous. Spring growth has tinge of bronze that creates a striking effect. Grows 6 feet high and 8 feet wide. Bright yellow flower clusters

bloom June to September, rather than winter months, as other *Senna* described here. This is a tough plant that tolerates salinity, alkalinity, some flooding and even neglect. Plant in background where loss of leaves in winter is not notable. Early growth is slow, but after a season or two plants develop more vigor. Native to Sonoran and Chihuahuan Deserts.

Simmondsia chinensis
JOJOBA



This distinctive shrub is native to the Sonoran Desert, growing 4 to 8 feet high with an equal spread. Gray-green, leathery, evergreen leaves are dense, producing mounding growth adapted to informal and formal designs. Use as a foundation plant, hedge (accepts some shearing), screen or background shrub. Male and female flowers are borne on different plants, so both must be present for the female to produce the seeds, which have many commercial uses. Little or no pruning required. Plant in well-drained soil.

Tagetes lemmonii
MOUNTAIN MARIGOLD

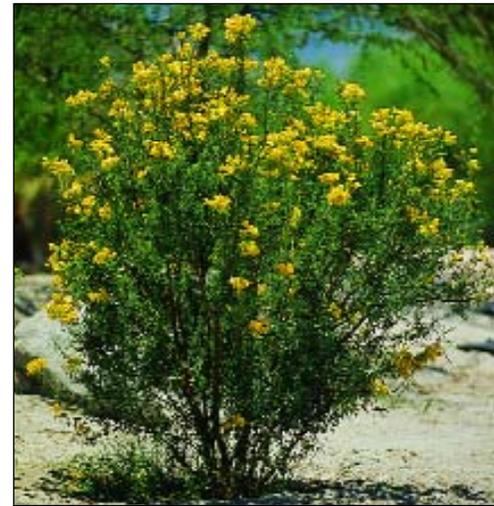


This mounding shrub from 3 to 4 feet high can be recognized by its golden yellow,

Below left: *Simmondsia chinensis*, jojoba.

Below right: *Tagetes lemmonii*, mountain marigold.

Below: *Senna wislizenii*, shrubby senna.





Above right: *Tecoma* 'Orange Jubilee'.
 Above left: *Tecoma stans*, yellow trumpet flower.
 Above: *Tecomaria capensis*, cape honeysuckle.

daisylike flowers that develop in late fall. If not damaged by frost, flowering continues into spring. Finely divided, light green foliage is strongly aromatic. Cut foliage back by half in early summer to develop sturdy growth to support flowers. Native to southeastern Arizona.

Tecoma stans
 YELLOW TRUMPET FLOWER



(*Stenolobium stans*). Large, vigorous plant useful as shrub, espalier or background. In warm microclimates with time and training, it can become a small tree with a potential to reach 15 to 20 feet high. Yellow clusters of trumpet-shaped flowers adorn the plant from June to February. Provide full sun and heat, with moderate water. Prune to control the vigorous growth. Native to Mexico and West Indies.

Tecoma 'Orange Jubilee' is similar in size and form but produces an abundance of bright orange, tubular flowers.

Tecomaria capensis
 CAPE HONEYSUCKLE



Large, upright, evergreen shrub 6 to 10

feet high, or a spreading, non-climbing vine to 20 feet. Grown for its glossy green leaves and brilliant clusters of orange-red, trumpet-shaped flowers that bloom in winter and spring. This is a tough plant that adapts to a range of growing conditions. Rapid growth rate requires pruning to control during the warm season, which the plant accepts without problems. Recovers rapidly in spring if damaged by frost. Native to South Africa.

Thevetia peruviana
 LUCKY NUT



In warm microclimates, this shrub can be pruned to become a small umbrella-shaped tree from 15 to 20 feet high. Typically, however, it is a large shrub to 8 feet high and as wide. Strap-shaped leaves 3 to 6 inches long and 1/2 inch wide are a rich yellowish green. Foliage is dense and provides an excellent backdrop to the mildly fragrant flowers. Yellow or peach-colored, trumpet-shaped flowers to 3 inches in diameter adorn the plant spring into fall, and year-round in mild years. Soak the root zone deeply every week or two in summer for best performance. Young plants are hardy



to 25°F. Prune to remove frost-damaged stems in early spring. Native to tropical America.

Vauquelinia californica   
ARIZONA ROSEWOOD

Large evergreen shrub to small tree with one to several trunks. Grows at a moderate rate 10 to 15 feet high, spreading from 5 to 15 feet. Linear, leathery leaves up to 4 inches long are dark green above and velvety gray beneath. Large clusters of small white flowers appear on branch tips in late spring. A rugged and enduring plant with rich textured foliage and an ornamental character. An excellent alternative to oleander. Native to Baja California and, what was once Alta California, now Arizona.

Viburnum tinus   
LAURUSTINUS

A dense, evergreen shrub from 6 to 12 feet high and half as wide. Luxuriant deep green foliage is the background for large quantities of striking white flowers blushed with pink during fall and winter. Tends to develop mildew in heavy shade; locate in partial shade and out of afternoon sun. Native to the Mediterranean.

‘Robustum,’ roundleaf laurustinus, is more mildew resistant, has coarser leaves and whiter flowers. Often used as a narrow patio tree.

Viguiera deltoidea   
GOLDEN EYE

Outstanding small flowering shrub to 3 feet high and as wide. The grayish green leaves are covered with dense hairs, giving them an interesting texture. Conspicuous yellow daisy flowers offer bright splashes of color from spring into summer. Seeds are enjoyed by birds. Native to the Sonoran Desert.

Xylosma congestum   
XYLOSMA

(*X. senticosum*). Versatile, medium-sized evergreen shrub 6 to 10 feet high. Also can be grown as a multiple-trunked tree, espalier, screen or clipped hedge. Arching branches are attractive on upright growth habit. New foliage has reddish tint, which then matures into glossy light green. Flowers are insignificant. Easy to control and accepts trimming well. Accepts some shade. Native to China.

Above left: *Vauquelinia californica*, Arizona rosewood.

Above: *Viguiera deltoidea*, golden eye.

GROUND COVERS

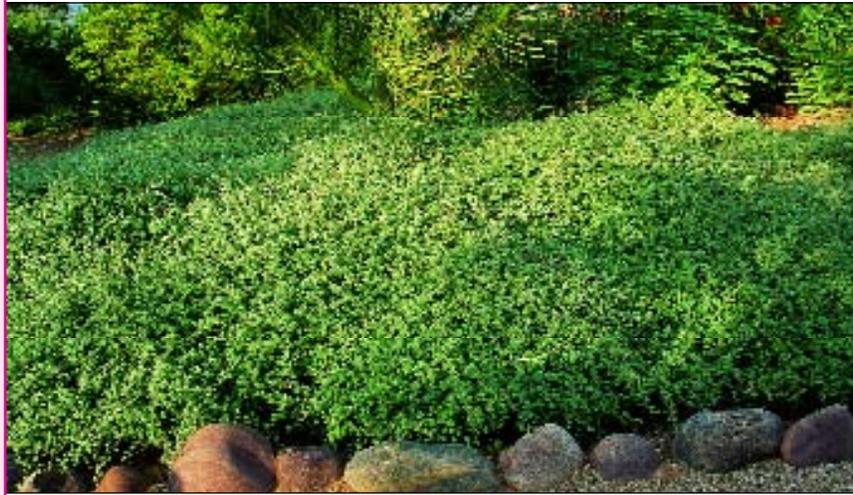
LUSH & EFFICIENT



Ground covers spread over the ground, covering the soil surface with a carpet of foliage and flowers. They retain moisture in the soil, saving water. Planted on slopes and banks, they help reduce soil erosion. As a landscape element, ground covers can be a bold statement on their own, or a unifying element with other plant forms.

Ground covers are available in different growth habits. They clump, mound, creep or trail. Clumping ground covers form upward-reaching clumps. Mounding forms create downward-reaching clumps. The foliage of creeping forms stiffly hug the ground, while trailing forms are relaxed. Trailing ground covers are adapted to grow in planters where they add interest by draping over the edges.

Grass lawns are also a form of ground cover. For more on lawns, see page 142.



Acacia redolens
'Prostrata'

PROSTRATE ACACIA



Generally reaches 1-1/2 to 2 feet high and can spread 8 to 10 feet wide. Some mounding occurs at crown. Remove vertical growth shoots as they occur. Yellow puffball flowers bloom in spring. Rapid coverage on slopes and for erosion control. Native to Australia.

'Desert Carpet' is a selection with a more prostrate growth habit.

Baccharis X
'Centennial'

PROSTRATE DESERT BROOM



A low-growing, wide-spreading hybrid between *Baccharis sarothroides* and *B. pilularis*. Grows well under both dry and moist conditions, roots deeply to prevent erosion and presents a good-looking, year-round appearance. Grows 1 to 2 feet high, spreading 3 to 6 feet wide. Plant 2 to 3 feet apart for ground cover. After plants are established, cut them back in winter to early spring to control and renew growth.

Native to southwest U.S. *Baccharis X* 'Starn' is a more uniform and compact selection.

Calylophus hartwegii
CALYLOPHUS



A clumping ground cover with masses of large yellow flowers to 2 inches wide. Blooms in spring, summer and into fall. Grows 1 to 1-1/2 feet high and spreads to 2 feet wide. Leaves are narrow and bright green. Attractive when tucked in among boulders or massed in clusters. Plant in soil that has good drainage. Cut back to 8 inches high in fall after blooming ceases to reshape and renew plant for spring growth. Plants are dormant in winter. Native to southeastern Arizona.

Chrysactinia mexicana
DAMIANITA



This is a low, clumping, evergreen ground cover with a slow growth rate. Damianita bears solid yellow, daisylike flowers from April to September, and are more prolific with weekly watering. Plants grow 1 to 2 feet high with an equal spread. After a long

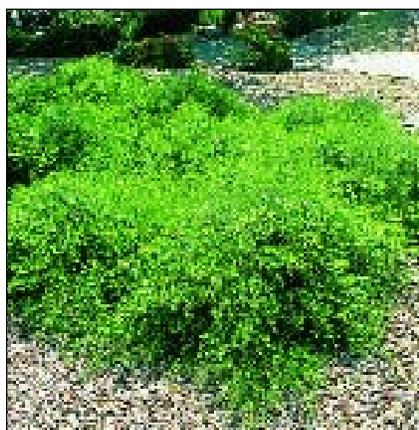
Below left: *Chrysactinia mexicana*, damianita.

Below right (bottom): *Calylophus hartwegii*, calylophus.

Below center: *Baccharis X* 'Starn' desert broom.

Below right (top) *Baccharis X* 'Centennial', prostrate desert broom.

Below: *Acacia redolens* 'Prostrata', prostrate



Below right: *Dalea capitata*, golden dalea.

Below: *Dalea greggii*, trailing indigo bush.

flowering season, lightly prune spent flowers to improve appearance. Plant in soil with good drainage. Native to west Texas into New Mexico.

Convolvulus cneorum
SILVER BUSH MORNING
GLORY



Dwarf, compact, evergreen shrub 2 to 3 feet high and 3 feet wide, with soft silvery foliage. Masses of 1-inch, round, white to pink flowers bloom late spring and summer. Plants located in full sun have fuller, more dense growth; in partial shade form is more open. Plant in well-drained soil. Native to southern Europe.

Convolvulus mauritanicus
GROUND MORNING
GLORY



Fast-growing, trailing evergreen perennial 1 to 1-1/2 feet high, spreading 2 feet wide. Small, round, gray-green leaves are covered with 1-inch-wide, lavender-blue flowers all summer. Plant in full sun only. Requires good soil drainage. Trim plants

back in winter to renew. Native to Africa.

Dalea capitata
GOLDEN DALEA

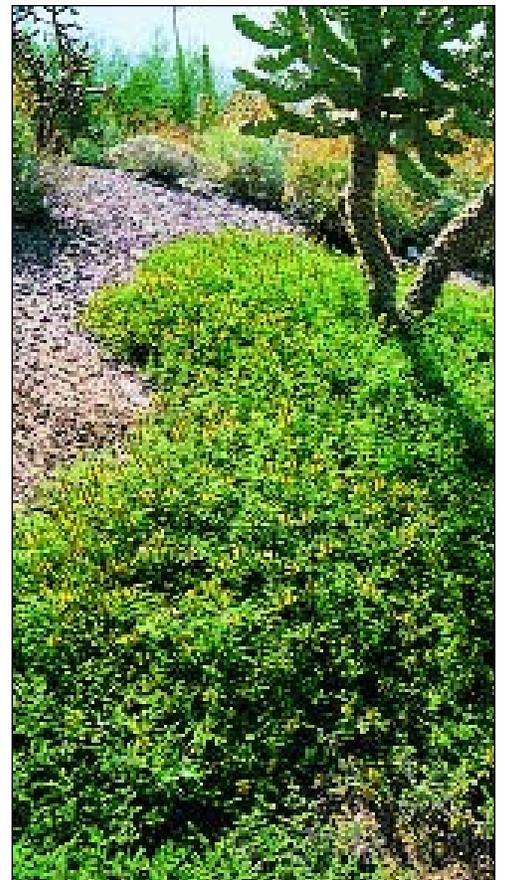


Creeping ground cover with small, fine textured bright green leaves. Can grow to around 1 foot high, spreading to 3 feet wide. Excellent in small planters or in a rock garden. Golden blooms cover plants in spring and again in fall. It can look unappealing when dormant in winter. Cut back in late winter to rejuvenate. Native to the Chihuahuan Desert. 'Sierra Gold' tends to be a more prolific bloomer.

Dalea greggii
TRAILING INDIGO BUSH



This Chihuahuan Desert native is admired by gardeners seeking a low-water use ground cover. Plants grow from 1 to 1-1/2 feet high with foliage that remains a handsome gray to gray-green all year long. Dainty purple flowers bloom in spring. A single plant can spread an incredible 10 to 15 feet in diameter. Little pruning is required unless plants are located in small spaces or along curbs or walks. Once



established, water need is low. Growth is more vigorous with moderate water. An ideal ground cover for erosion control. Install drip head or bubbler 1-1/2 to 2 feet from plant crown.

Gazania rigens leucolaena

TRAILING GAZANIA

(*G. leucolaena*). Clean, silvery green foliage spreads rapidly, forming an attractive, clumping cover. Grows 6 to 10 inches high spreading up to 2 feet wide. Daisylike flowers in a selection of yellows and oranges are borne in profusion practically every month of the year. Useful on banks for erosion control. Acceptable growth in relatively poor soil. Space 1-1/2 to 2 feet apart. Not for extremely hot or sunny locations, such as western exposure. Accepts some shade. Native to South Africa.



ing ground cover from 1-1/2 to 2 feet high spreading to 3 feet wide. Plants are blanketed with lavender flowers during the warmer seasons. If damaged by frost, prune in late winter and plants come back fast in the spring. Ideal bank cover, especially on sunny slopes, good for erosion control. Space plants 1-1/2 to 2 feet apart for ground cover. Native to South America.

‘Gold Mound’, a hybrid introduction from Texas A&M University, has rich gold flowers and does not produce seeds. Many other hybrids are available.

Myoporum parvifolium
MYOPORUM

A good ground-hugging cover for the Coachella Valley, myoporum is tough, hardy and fast-growing. It grows 3 to 4 inches high spreading wide to 6 to 9 feet. Bright green, 1-inch leaves with white flowers in summer produce a cooling effect. Branches root as they spread. Best with morning sun, which is an eastern exposure. Needs well-drained soil.



Below left (bottom):
Convolvulus mauritanicus, ground morning glory.

Below left (top):
Convolvulus cneorum, silver bush morning glory.

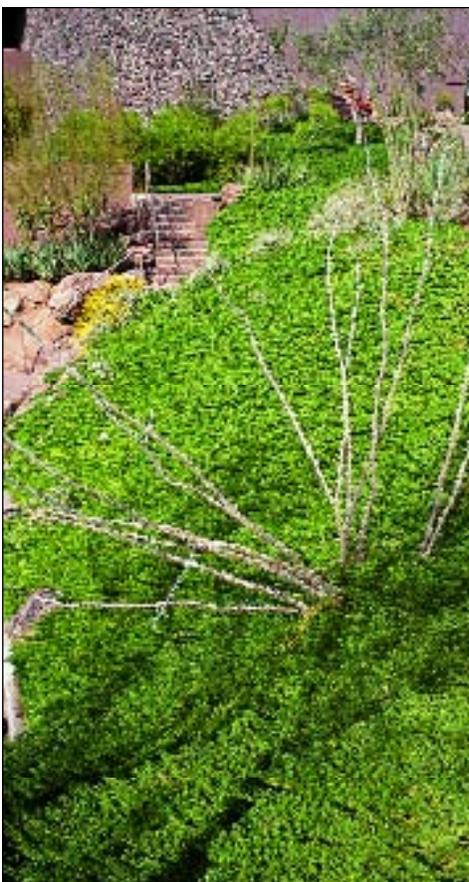
Below center: *Myoporum parvifolium*, myoporum.

Below: *Lantana montevidensis*, trailing lantana.

Lantana montevidensis

TRAILING LANTANA

Clumping, rapid-growing and free-bloom-





Above right: *Ruellia brittoniana* ÒKatieÕ, dwarf ruellia.

Above left: *Oenothera berlandieri*, Mexican evening primrose.

Above: *Rosmarinus officinalis* ÒProstratusÕ, prostrate rosemary.

Works well as cover on slopes and banks, but does not tolerate traffic. Native to Australia.

Oenothera berlandieri
MEXICAN EVENING
PRIMROSE



This plant makes a colorful, upright ground cover for small areas. Grows to 12 inches high with 1-1/2-inch, rose-pink blossoms that bloom late spring into summer. Cut back prior to bloom in late winter, then again after flowering ceases for best performance. Be aware that this plant can be invasive, and spreads by underground runners to invade nearby plantings, particularly in regularly irrigated areas. Native to the Chihuahuan Desert.

Oenothera stubbei
CHIHUAHUAN PRIMROSE,
SALTILLO PRIMROSE



In past years, this plant was incorrectly labeled *Oenothera drummondii*, and sold as Baja primrose. It is an evergreen ground cover that reaches 6 inches high and spreads to around 3 feet wide when given regular moisture. Buttery yellow flowers to 3 inches across open in evening and fade the

next morning. Blooms throughout the year, but heaviest in spring. Spreads by underground runners, making it good for erosion control. Best in partial shade to half-day of full sun. Native to the Chihuahuan Desert of northeastern Mexico.

Rosmarinus officinalis
‘Prostratus’



PROSTRATE ROSEMARY
Prostrate rosemary can be clumping, mounding, creeping or trailing, depending on the cultivar. Upright cultivars grow into shrub forms to 6 feet tall. Select cultivars carefully to fit garden space. All forms of rosemary can be used as the culinary herb.

Native to the Mediterranean. ‘Prostratus’ spreads 4 to 8 feet and remains less than 2 feet high. Small, light blue to violet flowers are profuse in early spring. Many new varieties are becoming available. Some have broader leaves, such as ‘Miss Jessup’, and others have brighter colored flowers such as ‘Collingwood Ingram’. ‘Huntington Carpet’ is a particularly low-growing selection that retains foliage in the center of the plant better than other creeping forms.



Ruellia brittoniana
'Katie'

DWARF RUELLIA

This dwarf herbaceous plant grows to just 12 inches high, spreading in a mounding form by underground runners. Blue, bell-shaped flowers to 2 inches across bloom summer into fall, set off by medium green leaves 4 to 6 inches long. Can be used in containers, as a small-area ground cover or as a filler beneath taller plants. Native to Mexico.



Vinca major
PERIWINKLE

This mounding ground cover grows rapidly to 1-1/2 feet high, spreading by runners that root as they spread to several feet wide. It's an aggressive grower and can be invasive. Vigorous, glossy green foliage makes a wonderful background for star-shaped, lavender-blue flowers that bloom spring and summer. Plant 1-1/2 to 2 feet apart for ground cover. Native to Africa.



Teucrium chamaedrys
'Prostratum'

CREeping GERMANDER

Like rosemary, this herb can be bushy or creeping, be sure to purchase the creeping form if you want a ground cover. Unlike rosemary, the leaves are bright glossy green and rounded, and not at all needle-like. Creeping germander spreads rapidly, forming a thick cover 8 to 10 inches high. Plants root deeply and make an excellent soil binder. Plant 12 to 15 inches apart. Spikes of attractive, rosy lavender flowers bloom in spring and summer. Native to the Mediterranean.



Wedelia trilobata
YELLOW DOT

A rapid growing, trailing ground cover to 1-1/2 feet high and 6 feet wide. Glossy, dark green leaves make an excellent backdrop to the small, golden yellow, daisylike flowers that cover the plant during the warm season. Locate carefully—this plant can be an aggressive grower if overwatered. Once established, water deeply only once a month in summer. Although it can grow in full shade, plants produce more flowers in full sun. Finches like the seeds. Native to Central and South America.



Above left (top):
Teucrium chamaedrys
Prostratum, creeping
germander.

Above left (bottom):
Vinca major, periwinkle.

Above right: *Wedelia tri-*
lobata, yellow dot.

Above: *Oenothera stub-*
bei, Chihuahuan prim-
rose.

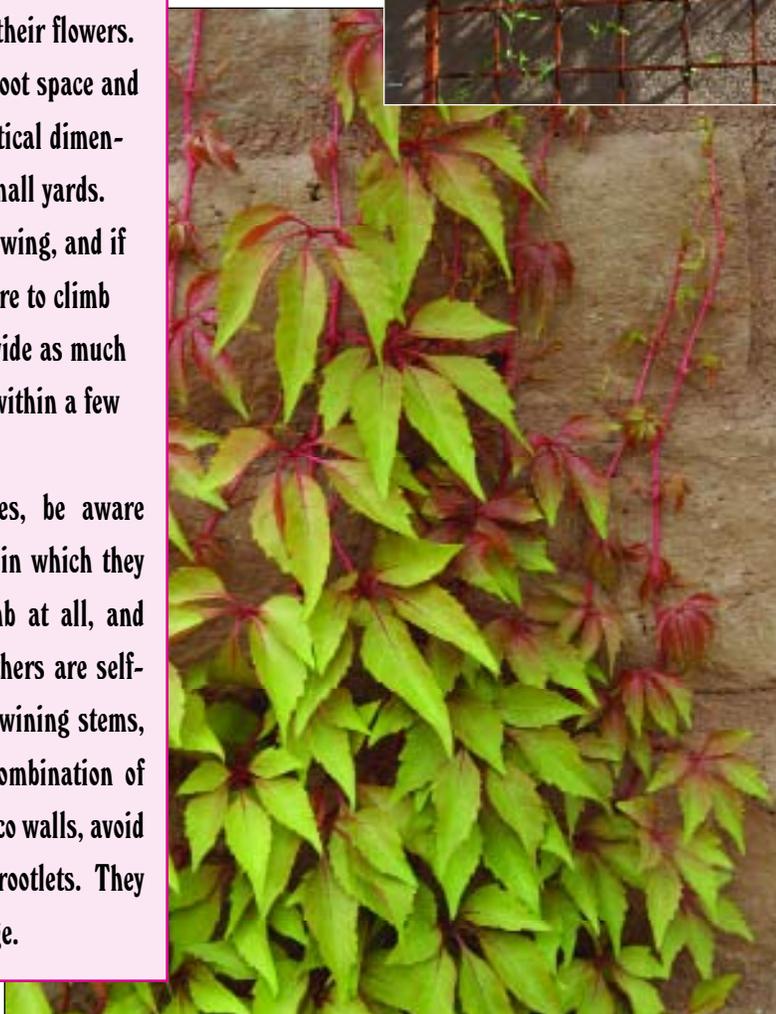
VINES

LUSH & EFFECTIVE



Vines are valuable, versatile plants. Plant them for restful green leaves, shade, screening, overhead protection, or for the pure beauty of their flowers. Because they need little root space and take advantage of the vertical dimension, they are ideal for small yards. Many species are fast growing, and if provided a proper structure to climb on, a single vine can provide as much shade as a large tree—within a few years.

When considering vines, be aware of the different methods in which they climb. Some do not climb at all, and must be tied in place. Others are self-climbing, with tendrils, twining stems, grasping rootlets or a combination of methods. If you have stucco walls, avoid plants that climb with rootlets. They may cause serious damage.



Antigonon leptopus
QUEEN'S WREATH,
CORAL VINE



In its native habitat, this Sonoran Desert native is usually found growing in canyons. It is a rapid-growing, twining climber, the stems up to 40 feet long providing quick, attractive cover. Leaves are bright green, large and heart-shaped. Queen's wreath blooms profusely with large clusters of bright pink flowers with deeper pink centers. (See photo, opposite page, top.) Flowers attract bees. Plant goes dormant and freezes to ground when temperatures drop below 32°F. It regrows from roots when warm temperatures return in spring. If low temperatures are expected, cover roots with a deep layer of mulch.

'Baja Red' produces bright red flowers.

Bougainvillea species
BOUGAINVILLEA



Bougainvillea species are popular "workhorse" plants in the Coachella Valley. Shrub and vining forms produce volumes of color from their *bracts*—the modified leaves that surround the actual, tiny white flowers. Select a warm microclimate for a planting site because bougainvillea is relatively frost-tender. If nipped by frost, wait until spring to remove frost damage. Plants produce a lot of litter, so avoid planting near pools. After young plants are established, keep bougainvillea on the dry side, which surprisingly encourages plants

to produce more flowers. Originally native to South America. Numerous cultivars are available in a wide range of colors. A few favorites are listed here.

'Barbara Karst' produces cascading masses of large, brilliant red to magenta bracts that are borne almost continually. One of the earliest to bloom each year. Can take lower temperatures than the other cultivars. 'California Gold' has rich golden orange bracts that bloom profusely in vivid contrast to its deep green leaves. 'Jamaica White' has masses of frothy, sea foam white bracts that cascade from branch tips. Blooms occasionally take on a slight pink tinge with cooler weather. 'Orange King' is covered with bronzy orange-gold flower bracts in graceful sprays. 'Texas Dawn' produces rosy pink bracts suspended from long arching sprays. 'Temple Fire' is a newer cultivar that is partially cold-deciduous with bronze-red bracts.

These two are more shrublike in their growth habit: 'Crimson Jewel' has luxurious, dark foliage, which make an ideal background for hundreds of brilliant, glowing, red bracts. Plant grows vigorously from 3 to 5 feet high. 'La Jolla', with red bracts, is similar but more compact. It is good in containers.

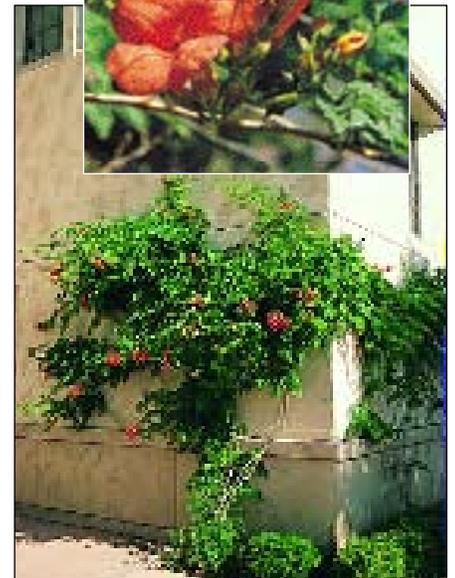
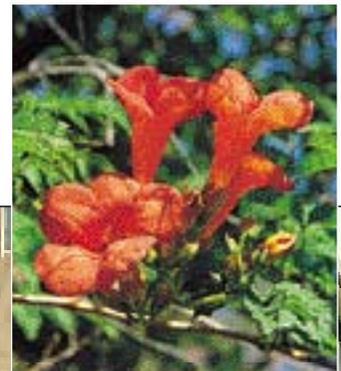
Campsis radicans
TRUMPET VINE



This southeastern United States native is tolerant of the harsh summer growing

Below left: *Bougainvillea* species, bougainvillea.

Below: *Campsis radicans*, trumpet vine.



Below right: *Mascagnia macroptera*, yellow orchid vine.
 Below center: *Macfadyena unguis-cati*, catclaw.
 Below: *Gelsemium sempervirens*, Carolina jessamine.

conditions in the Coachella Valley. It is vigorous and self-climbing to 20 feet or more high and wide. The dark green leaves are deciduous in winter. Clusters of 3-inch, orange or red flowers bloom summer and fall and are pollinated by hummingbirds. Rapid growth rate. Use as a color accent, shade or screening. Grows best in partial shade. Provide regular water to maintain flowers and dense foliage.

Clytostoma callistegioides

LAVENDER TRUMPET VINE



(*Bignonia violacea*, *B. speciosa*). This evergreen vine accepts sun or shade. Pale lavender to violet, trumpet-shaped flowers 3 inches long bloom in spring and summer, set off by glossy green leaves. It climbs by tendrils, then terminal shoots cascade downward for a curtainlike effect. Prune in late winter to control and to renew plants. Native to Brazil.

Gelsemium sempervirens

CAROLINA JESSAMINE



An evergreen, twining vine with rich green leaves. Climbs to about 20 feet, but does require support. Profusion of trumpet-shaped, bright yellow, fragrant flowers

bloom in late winter to early spring. Does best in partial shade in the Coachella Valley. Cut back severely if it becomes too heavy. Note that all plant parts are poisonous. Native to southeastern U.S.

Hardenbergia violacea



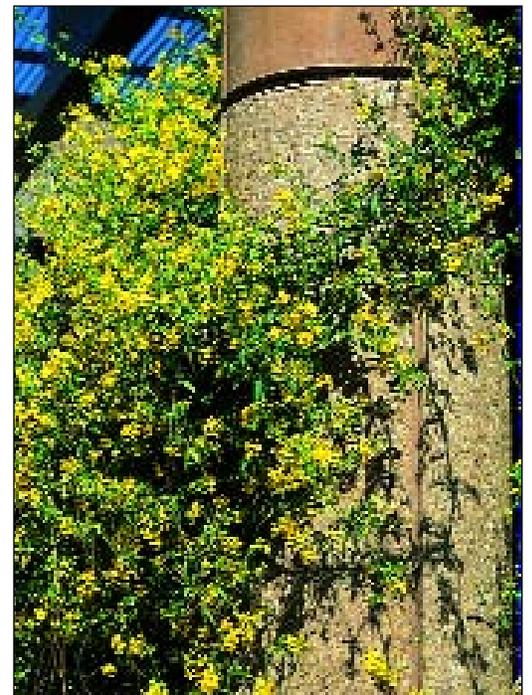
LILAC VINE
 An evergreen vine with long, rich green leaves. Bark is a rich cinnamon brown. Climbs by twining to 10 feet in just one year, but requires support. Dense clusters of sweet pealike, bright lilac-purple flowers bloom in late winter to early spring. Wonderful evergreen cover on arbors, especially as it ages and the richly colored bark gets to show off. Accepts some shade. Cultivars are available in shades of white, pink and blue. Native to Australia.

Jasminum mesnyi

PRIMROSE JASMINE



(*Jasminum primulinum*). Fast growing, reaching to 10 feet in the first year, with medium green leaves and large yellow flowers bloom in late winter. A sprawling vine, it can be tied onto trellises. Controls erosion on banks, cascading down them. Left alone, it develops into a large, fountain-shaped shrub. Accepts some shade. Native to western China.



Lonicera japonica
'Halliana'

HALL'S HONEYSUCKLE



Vigorous, twining, evergreen vine that is occasionally grown as a rampant ground cover. Fast cover on fences and trellises. Renew growth by cutting plants back severely in late winter every year or two. Highly fragrant flowers are pure white then quickly turn golden yellow. They are most profuse in spring, blooming sporadically in summer. Medium green foliage. Accepts full sun to partial shade.

Macfadyena
unguis-cati

CATCLAW



Dense green foliage shows off bright yellow flowers that cover the plant in spring, although flowering is profuse, the season is short lived. Rapid, vigorous growth with clinging rootlets, it can spread 30 to 40 feet vertically or horizontally. Best on chain link fence or brick—it has been known to pull stucco off walls. Native to Central and South America.

Mascagnia macroptera
YELLOW ORCHID VINE



(*Callaeum macropterum*). Twining vine with small, interesting, medium green leaves. Use on a trellis, chain-link fence

or any upright support. Accepts some shade. Dense clusters of showy, yellow, orchid-shaped flowers appear in spring (if plants did not freeze the previous winter), and in fall. Remove frost-damaged leaves and stems in late winter or early spring. Moderately fast grower, reaching 15 feet in a year. Native to Mexico.

A similar plant is *Mascagnia lilacina*, purple orchid vine. It is about the same size and habit as yellow orchid vine, but is more cold hardy and flowers are purple.

Merremia aurea
MERREMIA



This vine can grow to 25 feet or more with support. Bright yellow, 2-inch, morning glory-type flowers bloom summer and fall, accompanied by dense, bright green leaves divided into five leaflets. Requires full sun for good growth and flowers. Regular water during growing season is necessary for flower production. Plant near a wall, fence or other structure on which to climb. Fast growth allows its use as wind or sun screen. Control rampant growth with pruning. Remove frost-killed vegetation in spring after danger of frost has passed—plants recover quickly. Native of southern half of Baja California.

Also consider *Merremia dissecta*, mile-a-minute vine, with white flowers.

Below left (bottom):
Hardenbergia violacea,
lilac vine.

Below left (top): *Lonicera japonica* 'Halliana',
Hall's honeysuckle.

Below center: *Jasminum mesnyi*, primrose
jasmine.

Below: *Merremia aurea*,
merremia.





Above right: *Rosa banksiae*, Lady Banks' rose.
 Above left: *Passiflora X alatocaerulea*, passion flower vine.
 Above: *Podranea ricasoliana*, pink trumpet vine.

Parthenocissus tricuspidata
 'Hacienda Creeper'
 HACIENDA CREEPER



This cultivar of Boston ivy is semievergreen. A vigorous, clinging vine that will attach itself to masonry walls and stone-work. Bright green, compound leaves turn to vivid shades of red and orange in fall. Locate where plants will receive some shade, preferably in the afternoon. Hybrid of parents native to China.

Passiflora X alatocaerulea
 PASSION FLOWER VINE



(*Passiflora pfordtii*). Twining evergreen vine rapidly growing to 30 feet in a single year. Foliage has a tropical look with three parted, bright green leaves. Masses of 4-inch, spectacular flowers bloom in summer and are used to make perfume. Flowers are pink tinged white, with a crown of purple. Accepts some shade. Protect from wind. Hybrid of *P. alata* of Peru and *P. caerulea* of Brazil.

Passiflora foetida longipedunculata
 BAJA PASSION VINE



This evergreen twining vine can grow to 10 feet in a year. The gray-green leaves are velvety and provide a nice backdrop to the white with lavender blooms that last through the warm season. It can freeze

to the ground, but will rapidly recover in spring. Accepts some shade. Native to Baja California.

Podranea ricasoliana
 PINK TRUMPET VINE



Twining vine with stems up to 20 feet long. Rich green leaves are divided into 9 to 11 leaflets. Clusters of pink flowers to 2 inches long bloom summer and fall. Stems damaged by frost recover rapidly in spring. Use on a trellis or chainlink fence, tying stems in place. Ideal plant for high-water, mini-oasis garden location. Native to southern Africa.

Rosa banksiae
 LADY BANKS' ROSE,
 TOMBSTONE ROSE



Provide this popular evergreen to semi-deciduous vine with sturdy supports as it grows vigorously to 10 to 25 feet. Lady Banks' rose is suited to large-scale landscapes, where it can spread out or climb an arbor. This rose produces no thorns, so it is fine to use near pedestrian traffic areas or by pools. Native to China.

'Lutea' blankets plants with double pale yellow flowers in spring. 'Alba Plena' has double white flowers. Native to China.

Trachelospermum jasminoides
 STAR JASMINE



(*Rhynchospermum jasminoides*). Lustrous,



deep green, leathery foliage, this plant is most admired for its masses of white, highly perfumed, star-shaped flowers, which bloom most heavily in spring. Versatile uses include espalier, pillar support vine or ground cover. Needs support such as a trellis on which to climb. Best on east or north exposures. Native to China.

Vitis vinifera
GRAPE



This deciduous vine is grown for its fruit, as well as for the lush, heart-shaped medium green leaves. It clings by tendrils, growing vigorously to 10 to 20 feet, supplying cooling summer shade. Provide vines with a sturdy support structure. Prune canes in winter. Grape leaf skeletonizers arrive in waves during summer to quickly strip leaves. Watch for the small, blue-black, slow-moving moths that lay the eggs. Native to the Mediterranean.

Vigna caracalla
SNAIL VINE



(*Phaseolus caracalla*). Snail vine is a vigorous, twining plant, reaching 30 feet in a year. With a foliage effect similar to the vegetable pole bean, it makes an excellent screen. Masses of slightly fragrant, showy, lavender flowers bloom throughout the year. Excellent trained on wire fences or on banks. Remains evergreen in mild winters. If frost kills top growth, cut back in early spring to rejuvenate growth. Occasionally mislabeled as *Phaseolus gigantea*. Native to tropical South America.

Wisteria floribunda
JAPANESE WISTERIA



The bright green foliage of Japanese wisteria is deciduous. Twining, woody growth reaches to 25 feet. Native to Japan. 'Longissima Alba' is impressive with its pure white flowers that cascade in spikes to 4 feet long. 'Royal Purple' attracts attention with long, violet-purple flowers in spring. Often sold as *W. multijuga*.

Vitis californica

CALIFORNIA WILD GRAPE



Climbing by tendrils, wild grape can reach 30 feet in a summer. Grow it for the foliage, not the tiny, tart fruit. Leaves emerge gray and brighten to green, then turn red in fall and drop. Vines regrow the following spring. 'Rogers Red' holds its gray-green leaf color all summer, then turns brilliant red and orange in fall. Native to California and Oregon.

Wisteria sinensis

CHINESE WISTERIA



This is the more commonly grown wisteria in the West. It has a twining and deciduous form with medium green foliage. Needs support to grow; such as on top of an arbor. It reaches up to 30 feet long. In spring, puts on a show of purple or white flowers, depending on cultivar. Native to China.



Above left: *Parthenocissus tricuspidata*
ÔHacienda CreeperÔ.

Above center: *Vigna caracalla*, snail vine.

Above right: *Passiflora foetida longipedunculata*, baja passion vine.

Above: *Wisteria floribunda*, Japanese wisteria.

CACTI & SUCCULENTS

LUSH & EFFICIENT

Cacti and other succulents are excellent choices for a low-water, low-maintenance landscape. In fact, their low-water rating is actually lower than other plants. Water most cacti, for example, about every two weeks in summer. From a design standpoint, most are bold accents; others are almost shrublike. Some are attractive clustered together in groups or even as a mass planting; others are more effective planted as single specimens. Resist the temptation to get one of each and drop them here and there about the yard. The result becomes an unnatural and unappealing hodge podge. Use cacti and succulents as exclamation points in the landscape, or partner with flowering perennials and shrubs.



Agave species

AGAVE

Agaves are also known as century plants. Although most live far less than a century, they do endure for many years, slowly storing energy and getting larger. They finally spend their energy in one massive flowering event. Depending on the species, they grow a single large flower stalk up to 15 to 30 feet high, offering flowers for pollination by hummingbirds, other birds, and bats. After flowering, the plant dies.

Some agaves like to hedge their bets when it comes to reproduction. Before they flower they also produce a number of small offsets called *pups* around their base. If you prefer, you can select a species that is “solitary” and does not produce pups as readily.

Most agaves have sharp spines on the tips of their leaves. Many also have teeth along the leaf margin. This can make them beautiful to behold but dangerous to be near. Locate them well away from walkways or gathering areas, and allow for their mature size. Unlike a shrub or ground cover, you cannot trim or prune agaves back to suit a small space. You must learn to live with it, or remove it.

Agave americana
CENTURY PLANT



Grayish blue-green leaf blades with spines on tips and margins. With time, grows to 10 feet high and spreads to 15 feet wide—too large for many gardens. Average life span is 20 years. A number of slightly smaller, variegated varieties of *A. americana* are available. Native to Mexico, but naturalized in mild-winter climates worldwide.

Agave americana
marginata

VARIEGATED
CENTURY PLANT



Grayish blue-green leaf blades feature a stripe of yellow down both sides of every leaf. Plant reaches to 10 feet high and 13 feet wide. Because of its large size, locate it carefully. Accepts some shade.

Agave americana
mediopicta

MEDIOPICTA VARIEGATED
CENTURY PLANT



Grayish, blue-green leaf blades feature a stripe of yellow down the middle of every leaf, as compared to the leaf margins of *A. americana marginata*. Plant reaches 4 feet high and 4 feet wide. Accepts some shade.

Below left: *Agave americana mediopicta*, mediopicta variegated century plant.

Below: *Agave americana marginata*, variegated century plant.



Below right: *Agave vilmoriniana*, octopus agave.

Below left: *Agave colorata*, mesquite ceniza.

Below: *Agave murpheyi*, Murphey's agave.

Agave colorata
MESCAL CENIZA



Broad, blue-gray leaf blades are edged with intricate dark brown teeth that leave embossed patterns on the leaf they were pressed against in the bud. Solitary plants form an angular yet compact rosette 4 feet high and 4 feet wide. Slow to moderate growth rate. Native to Sonora, Mexico.

Agave geminiflora
TWIN-FLOWERED AGAVE



Narrow, medium green leaves have sharp tips but toothless edges. Occasionally, the leaves are graced with fine white marginal fibers. Solitary plants reach 3 feet high and 3 feet wide with a moderate to rapid growth rate. Tolerates a range of exposures. In full or reflected sun, the rosettes are tight and compact. Plants in full shade have a more open and relaxed growth habit. Can be grown as a container plant. Native to west-central Mexico.

Agave murpheyi
MURPHEY'S AGAVE



Medium wide leaves are bluish to yellow green with spines on the tip and many fine teeth along the edges. Slow to moderate growers, plants reach 3 feet high and 3 feet wide. Pups form readily from the base, but also can be found on the flowering stalk. Accepts some shade. These were once

cultivated by native Indians in Arizona. Native to Arizona and Sonora, Mexico.

Agave parryi
PARRY'S AGAVE



Broad, gray-green leaves are edged with brown teeth that leave embossed patterns on the leaf they were pressed against in the bud. Forming compact, nearly round rosettes, individual plants reach 3 feet high and as wide, and can pup readily into large colonies. Native from central Arizona into New Mexico.

Agave victoria-reginae
QUEEN VICTORIA AGAVE



A compact, symmetrical little agave that does fine in containers or in the ground, and takes on quite a regal appearance. It is excellent for smaller spaces, and in filtered light under trees. The short, thick leaves have distinctive white markings and a single spine on the tips. The solitary plants reach 1 to 1 1/2 feet high and as wide. Native to Mexico.

Agave vilmoriniana
OCTOPUS AGAVE



Light green, fleshy, and unarmed, the leaves of the octopus agave elongate and curve back, arching with age, until the plant does look remarkably like a large green octopus. The solitary plants reach 4



feet high and spread to 6 feet wide with a slow to moderate growth rate. They flower when they are around a decade old. They do not pup from the base, but can easily be grown from pups called *bulbils* that appear on the flowering stalk. Native to west-central Mexico.

Agave weberi
WEBER'S AGAVE



One of the largest agaves, it makes a dramatic accent with broad, blue-green leaves that form a neater rosette than *Agave americana*. Leaf edges have many fine teeth. Individual plants reach 5 feet high and 5 feet wide with a slow to moderate growth rate. Needs occasional watering to look its best. Accepts some shade. Occasionally produces pups. Native to east central Mexico.

Aloe species

ALOE

Aloes are highly variable in form, size, color and texture. Some species make dramatic accents, such as *Aloe ferox*, while others, including *Aloe vera* and *Aloe variegata*, look their best massed in large beds. Many do well in containers. Once they are mature, they flower every year with long stalks of flowers pollinated by hummingbirds. Not

all aloes are medicinal such as *Aloe vera*—some are used to make poison darts! Aloe mite can be a problem with some species. All aloes are native to Africa.

Aloe arborescens

TREE ALOE



Thick, fleshy leaves are usually gray-green although they can vary with subspecies; some are sea green to lime green. Leaves are 2 inches wide and 2 feet long with regular gray teeth along the margins. Growth is upright and bases become woody. In their native South Africa, ancient plants reach 3 to 14 feet high, topped in winter with tall spikes of red flowers.

Aloe dawei

DAWE'S ALOE



This is a dramatic aloe for winter color, with tall, branched spikes of fiery, orange-red tubular flowers December through February. Hummingbirds adore the flowers rich in nectar. Long, narrow, bright green leaves are edged with small teeth, forming an almost shrublike cluster to 3 feet high and as wide. Does best with afternoon shade and water every two to three weeks in summer. Native to Uganda.

Aloe ferox

CAPE ALOE



A slow-growing, solitary aloe that eventu-

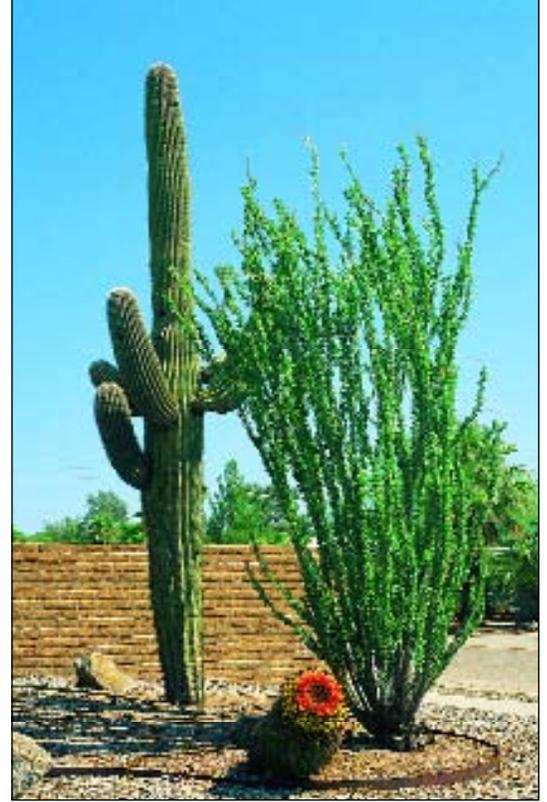
Below left: *Agave parryi*, Parry's agave.

Below center: (bottom): *Agave weberi*, Weber's agave.

Below center: (top): *Agave geminiflora*, twin-flowered agave.

Below right: *Aloe ferox*, cape aloe.





Above right: *Carnegieia gigantea*, saguaro cactus (ocotillo at right).

Above center: *Aloe vera*, aloe vera.

Above left (top): *Asclepias subulata*, desert milkweed.

Above: *Aloe variegata*, partridge breast aloe.

ally becomes treelike to 12 feet high and 5 feet wide. Thick, wide, bluish green leaves are edged with russet-colored teeth. Hummingbirds love the flaming orange-red flowers that appear clustered on a tall stalk from late winter into spring. Locate where plants will receive afternoon shade and water once a month in summer for best appearance. Native to the South African Cape.

Aloe variegata   20°
PARTRIDGE BREAST ALOE

This small aloe likes the protected understory environment beneath canopy trees or shrubs. It reaches 1 foot high and as wide with gray-green, triangular leaves decorated with white markings. Plants slowly form clumping colonies that produce spikes of coral-pink flowers in spring and again in fall, attracting hummingbirds. Provide protection from the afternoon sun. Excellent in a rock garden or mixed in with spring wildflowers. Native to South Africa.

Aloe vera   25°
ALOE VERA, TRUE ALOE

(*A. barbadensis*). Long, slender, gray-green leaves unmarked by any spots combined with yellow flowers lets you know this is the true medicinal aloe. Grows to 3 feet high, spreading to 3 feet wide. Flowers bloom late winter and into spring,

appearing on spikes up to 2 feet high above the plant. Accepts full sun to part shade; provide supplemental water in summer to those plants located in full sun. Native to Mesopotamia, and traded throughout Africa, Asia and Europe.

Asclepias linearis   20°
THREADLEAF MILKWEED

A bright green, fine-textured plant that can be used as an accent or backdrop in a water-efficient landscape. Soft, fine, threadlike leaves are held rigidly out from the multiple stems that form a shrublike clump to 3 feet high and as wide. Clusters of small white flowers appear on branch ends from spring into fall, and are a favorite of both queen and monarch butterflies. Native to southern Arizona.

Asclepias subulata   25°
DESERT MILKWEED

Grows to 4 feet high with slender, gray-green stems. Pale yellow, flat-topped flowers bloom in clusters from spring into fall. Seed pods to 3 inches long split and send out silvery seed fluffs. Great accent around rock-studded drainage swales or courtyards. Good soil drainage required. Attracts queen and monarch butterflies, especially if they are planted in a mass. Native to the Sonoran Desert.

Bulbine frutescens   
BULBINE

Long stalks of delicate yellow or orange flowers appear in spring, forming clumps to 18 inches high. Leaves of orange-flowering forms are more gray-green and are more tolerant of full sun. Leaves of yellow-flowering forms are brighter green and do better with some shade. Both grow best in well-drained soil. Can be grown in containers. Native to South Africa.

Carnegiea gigantea   
SAGUARO CACTUS

This columnar cactus is a well-known symbol of the Southwest. Extremely slow growing 50 to 60 feet high, it towers over the desert landscape. A saguaro may take 30 years to reach 10 feet high and be mature enough to flower. Large, white, bat-pollinated flowers appear wreathlike atop arms in May, followed by edible red fruit. Avoid winter irrigation, but supply monthly water in summer. Requires good soil drainage. Young plants can freeze at 30°F. In nature, they survive freezes and intense summer heat by growing under a “nurse tree.” Native to Sonoran Desert.

Cereus hildmannianus   
HILDMANN'S CEREUS

A fast-growing, columnar, clumping cactus. Each column is up to 10 feet tall and 6 to 8 inches around. However, the entire plant can spread to 10 feet wide. During summer, large, showy white flowers open

at night and fade by the next morning. A large, luscious, watermelon-flavored fruit follows the flowers, if they have been pollinated. Accepts some shade. Native to eastern South America.

Dasyilirion longissimum   
GRASS TREE

(*Dasyilirion quadrangulatum*). Dramatic, tropical-looking accent plant that eventually can reach over 10 feet high, topped with a whorl of long, slender, dark green, grasslike leaves. Although it only needs 8 to 10 inches of rainfall per year, it will tolerate more water, so it can be combined with other, more lush, tropical plants for great effect. Also accepts shade to part shade exposures. Native to Mexico.

Dasyilirion species   
DESERT SPOON,
SOTOL

Both of the following species are quite similar in appearance. They grow slowly, eventually developing a trunk. Mature size is 4 to 6 feet high, spreading to 5 feet wide. Once mature, flower spikes to 12 feet high appear in late fall, but age at which plants actually begin to bloom is unpredictable.

Dasyilirion acrotriche, green desert spoon, is almost identical to desert spoon: Its leaves are bright green rather than gray-green. Select this one if you seek a subtropical landscape effect.

Dasyilirion wheeleri, desert spoon, has narrow, gray-green leaves that are sharply

Below left: *Bulbine frutescens*, bulbine.

Below center: *Cereus hildmannianus*, Hildmann's cereus.

Below right: *Dasyilirion wheeleri*, desert spoon.

Below: *Dasyilirion longissimum*, grass tree.



Below right: *Euphorbia rigida*, gopher plant.
 Below left: *Echinocactus grusonii*, golden barrel cactus.
 Below: *Ferocactus wislizenii*, fish-hook barrel cactus.

toothed along the edges. It is highly attractive in a desert setting. Both are native to southern Arizona.

Echinocactus grusonii   
GOLDEN BARREL CACTUS
 One of the best cactus for a bold accent in the landscape due to its symmetrical, globular shape and brilliant, golden spines that light up in the sun. Grows slowly to 3 feet high or more, but remains a manageable size in most gardens for many years. Small yellow flowers appear in spring on the fuzzy crown of mature plants. Plant in sandy, well-drained soil. Water infrequently, perhaps once a month, slightly more often during summer. Native to Chihuahuan Desert.

vertical and spreading branches that grow 2 feet high by 4 feet wide. Flowers on tips of branches are brilliant chrome yellow. Most effective in a sunny spot. Mass in small areas in well-drained soil or plant in containers. After flowers complete bloom cycle, cut back branches to encourage new growth. Native to the Mediterranean.

Ferocactus cylindraceus   
COMPASS BARREL
(F. acanthodes). At home in natural desert landscapes, this stout, barrel-shaped cactus is a subtle accent in a water-efficient garden. Slow growing to 4 feet high by 1-1/2 feet wide. Plants tend to lean southward with time, giving them their common name. Spines are straight and reddish yellow. Yellow to orange flowers appear in May, followed by fruits with many, tiny, edible seeds inside. Natives would roast and eat the seeds. Avoid overwatering. Native to Sonoran and Mohave Deserts.

Echinocereus englemanni   
ENGELMANN'S HEDGEHOG
 A short, clumping cactus that stops traffic when its large, brilliant, magenta flowers appear in May. A plant may reach 1 foot high to 8 inches across, but clumps can eventually spread several feet wide. Long, gray, downward-pointing spines show bands of red after a rain. Accepts some shade. Native to Sonoran Desert.

Ferocactus wislizenii   
FISH-HOOK BARREL CACTUS
 This cactus looks much like the compass barrel, except the spines are curved in a fish hook shape. And, with time (several decades), it eventually reaches 10 feet high. Spring flowers are yellow to orange, followed by yellow, tart, edible



fruit filled with thousands of tiny black seeds. Avoid overwatering or plants may rot and die. Plant in sandy, well-drained soil. Native from Arizona into west Texas and Mexico.

Fouquieria splendens   
OCOTILLO

Ocotillo is one of the most distinctive plants of the desert Southwest, and helps provide the Coachella Valley with a definite sense of place. A few to many, unbranched thorny canes, 10 to 15 feet long, arch up out and away from the plant's base, creating a strong, vase shape. Small, bright green leaves cover the canes during periods of rain and humidity. Leaves drop during dry conditions as plants become dormant. Spikes of flame orange flowers that attract hummingbirds bloom at branch tips during spring. An excellent accent plant, especially when backlit by the sun. Prefers rocky limestone soils. Canes can be cut and used to create living fences. Note that plants grown in containers establish better than bare root plants. Native to southwestern U.S.

Hesperaloe parviflora   
RED YUCCA

This succulent is not a yucca, but in the agave family. It is a workhorse accent plant, flowering tirelessly. Long, slender, swordlike leaves are edged with loose,

curling white threads. Plants form clumps to 3 feet high and spread slowly to 5 feet or more. Red yucca is a long-term color provider with tall spikes of coral-pink flowers from late spring into late summer. The bell-shaped flowers are loved by hummingbirds. A variety with pale yellow flowers is also available. Native to Texas.

Hesperaloe funifera, giant hesperaloe, is similar but larger, reaching to 6 feet high and as wide. Leaves are upright, thicker and swordlike. Wide-spreading flower stalks to 10 feet high are topped with greenish white blooms late spring to summer. Native to the Chihuahuan Desert.

Nolina microcarpa   
BEAR GRASS

Narrow, grasslike leaves to 3 feet long form a fountain-shaped mound 3 to 6 feet high, spreading 5 to 8 feet wide. Leaf margins are covered with microscopic teeth. Stems rise 4 to 5 feet above the dense rosette clumps of small, creamy yellow flowers, which are striking in form, not in color. Plants thrive in gravelly, sandy, well-draining soil. Native to southwest U.S.

Opuntia species
PRICKLY PEAR

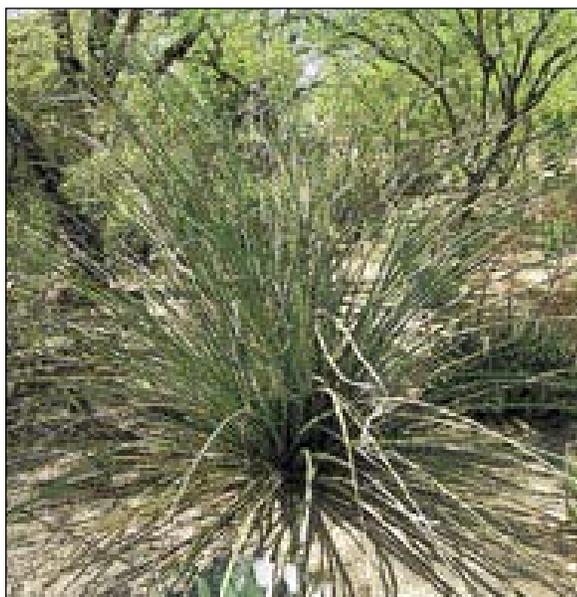
There are well over 200 varieties of prickly pear. Some have blue-gray pads, some

Below left: *Hesperaloe parviflora*, red yucca.

Below center: *Nolina microcarpa*, bear grass.

Bottom right: *Fouquieria splendens*, ocotillo.

Below: *Echinocereus engelmannii*, Engelmann's hedgehog.



Below right: *Opuntia* species, opuntia.
 Below center (bottom): *Portulacaria afra*, elephant's food.
 Below center (top): *Opuntia ficus-indica*, indian fig.
 Below left: *Opuntia basilaris*, beavertail prickly pear.

are bright green and others are tinged with violet. Cup-shaped flowers appear in May and bloom in shades of yellow, orange or magenta. All cactus family spines grow out of a cluster called an *aureole*. Some species lack long spines but have *glochids* instead. These are like porcupine quills, in that they are barbed to go further in, not out. If you are unfortunate enough to come in contact with these tiny spines, removing them from your skin is difficult. One method seems to work: Coat the area with white glue, let it dry, then peel them away.

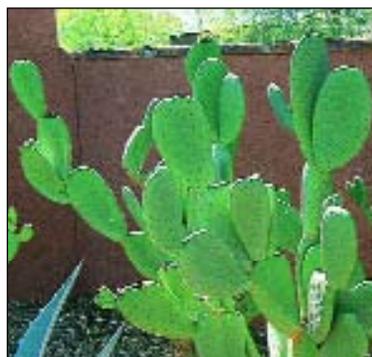
Opuntia basilaris
 BEAVERTAIL PRICKLY PEAR   10°
 Typically blue-gray or deep green pads with aureoles of glochids. (See above.) Brilliant magenta flowers appear in May. Grows to 1 foot high and spreads to 4 feet wide, taking the form and space of a small shrub in the landscape. Native to southwest U.S.

Opuntia engelmannii
 ENGELMANN'S PRICKLY PEAR   10°
 Classic green pads with widely spaced, gray-white thorns. Pads are crowned in spring with yellow flowers followed by magenta fruit. Desert tortoises adore the

sweet fruit, and people use the fruit to make jelly and candy. Reaches 4 feet high and spreads to 8 feet wide. Takes the form and space of a medium-sized shrub in the landscape. Native to southwest U.S.

Opuntia ficus-indica   22°
 INDIAN FIG
 The name refers to the edible fruit called "tuna," which were relished by the ancient Aztecs. This tall, almost tree-like prickly pear reaches up to 15 feet high and as wide. This species is thornless. Cup-shaped yellow to orange flowers are followed by fruit that slowly turn from green to yellow to a purplish red. It is uncertain where this plant originated. It is a horticultural selection discovered and cultivated in tropical and subtropical America.

Pachycereus marginatus   20°
 MEXICAN FENCEPOST
 This is a fast growing, handsome, dark green, columnar cactus. It can reach 10 feet high and branching from the base can spread to 6 feet wide, although each column is about 6 inches in diameter. The 4 to 6 ribs of each column are decorated with small white spines. Pink flowers



appear in spring. Use as a bold, dramatic accent in the ground or in a container. Plant along a wall for spectacular shadows. Extra arms are easy to remove with a pruning saw, and can then be planted directly in a new site. Native to southern Mexico.

Pachypodium lamerei
MADAGASCAR PALM   35°

This distinctive member of the oleander family has gray bark and a swollen trunk where it stores water. The crown of large leaves on top and paired spines along the stem give it its unique appearance. Slow growing from 10 to 15 feet high, the diameter remains about 2 feet wide. Protect from cold when temperatures drop near freezing. Or, if grown in a container, move to a warmer location when frost threatens. Plant in well-drained soil. Accepts some shade. Native to southern Africa.

Pedilanthus macrocarpus
SLIPPER FLOWER   25°

A striking succulent that forms a clump of mostly leafless, upright, silvery green stems about the diameter of your index finger. Stems reach 2 to 3 feet high with the

clump spreading slowly to 2 feet wide. The striking red “slippers” contain several tiny flowers, plus nectar that hummingbirds seek. They appear in late spring and occasionally summer into fall. Makes a fine container plant. Accepts some shade. Like most succulents, provide good drainage to avoid rot. Native to Baja California.

Portulacaria afra
ELEPHANT’S FOOD   28°

This succulent is well adapted to the Coachella Valley. It’s an excellent container plant with an interesting, flowing growth habit that is at home among boulders and native plants. It is often confused with jade plant, *Crassula argentea*, which it resembles. Elephant’s food grows more rapidly, has more open growth, with limber, tapering branches. Stems are brownish, covered with 1/2-inch, glossy green, succulent leaves. Best with afternoon shade, but too much shade can cause plants to become straggly. Can suffer damage with exposure to intense sun. Native to South Africa.

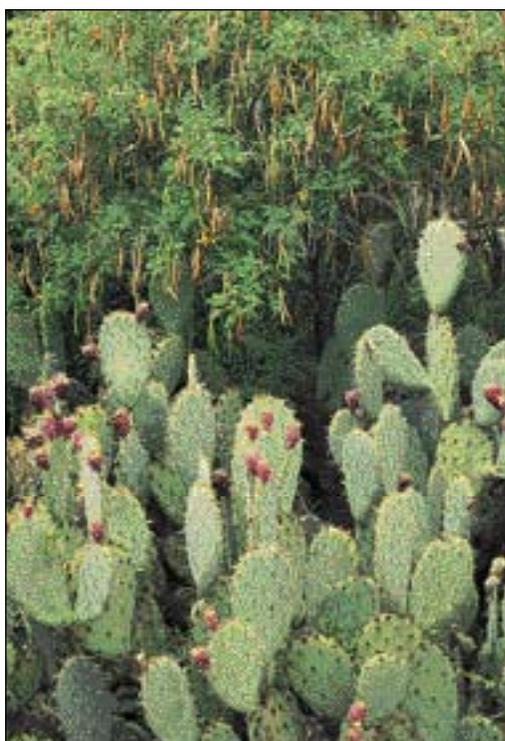
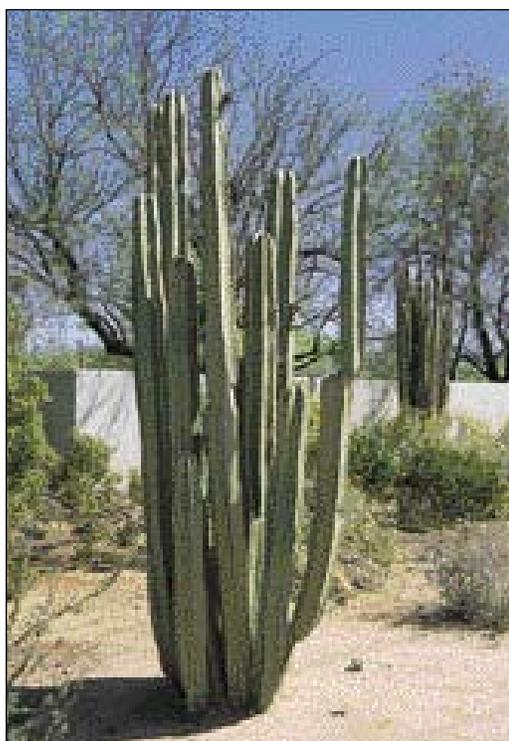
Stenocereus thurberi
ORGAN PIPE CACTUS   22°

A slow-growing golden-green columnar cactus with narrow ribs and aureoles of

Below left: *Pachycereus marginatus*, Mexican fencepost.

Below center: *Opuntia engelmannii*, Engelmann’s prickly pear.

Below right: *Pedilanthus macrocarpus*, slipper flower.



Below right:
Trichocereus huascha,
Argentine hedgehog.

Below center:
Stenocereus thurberi,
organ pipe cactus.

Below left: *Yucca*
baccata, banana yucca.

small reddish brown spines. Individual columns are about 8 inches in diameter, and grow to 10 feet high. Clumps can spread to 10 feet wide with time. Pale pink flowers open at night in late spring. Native to Sonoran Desert.

Trichocereus huascha   
ARGENTINE HEDGEHOG
(*Echinopsis huascha*). A clumping hedgehog cactus with golden spines covering an olive green body. They glow beautifully when backlit by the sun and can be quite dramatic. Huge glowing red to orange flowers appear in spring, each one lasting only a single day. Accepts some shade. Native to Argentina.

Yucca species

YUCCA

Yuccas are generally more cold tolerant than agaves. Indeed, some survive as far north as North Dakota. Yuccas may have spines on leaf tips, but never along the edges, as agaves often do. Yuccas can be solitary or form clumps from the base.

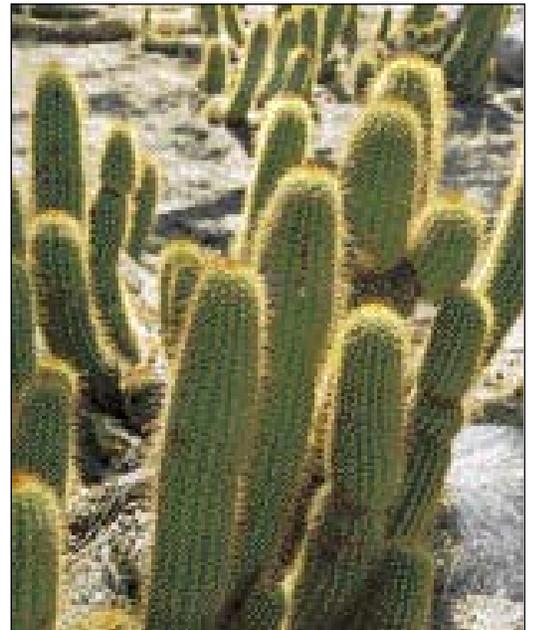
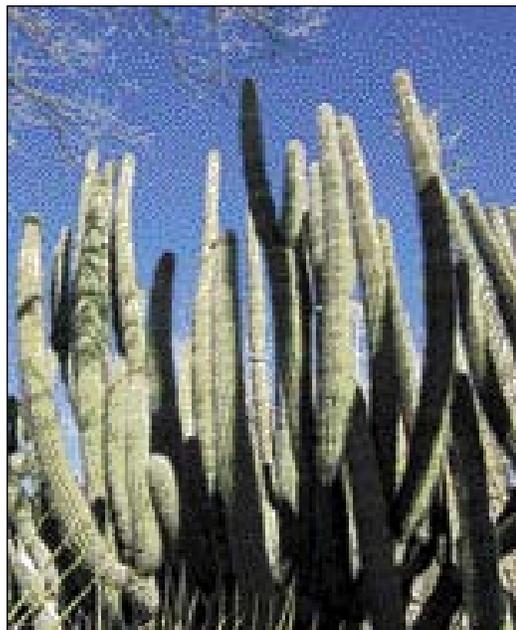
Once mature, yuccas bloom every year with tall stalks of creamy white flowers. Leave the dried stalks on the plant for the favorite nesting place of native bumblebees, or use in dried arrangements. All yuccas are native to the Americas.

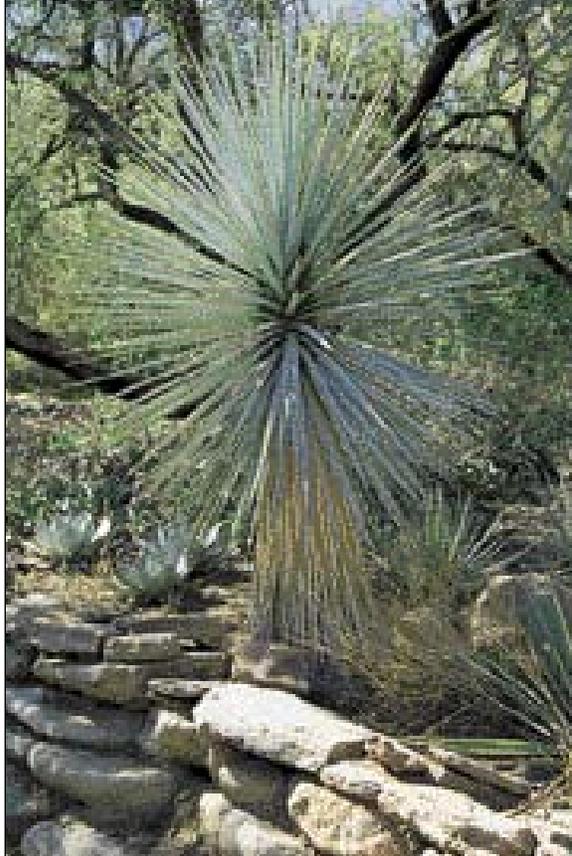
Yucca aloifolia   
SPANISH BAYONET
Stiff, sharp-tipped, 2-inch leaves are bright green to blue green, and grow 1-1/2 to 2-1/2 feet long. This is a clumping yucca—individual plants reach to 10 feet high and 4 feet across. Clumps may spread to cover 20 feet. An ideal accent for large spaces, but best located well away from pedestrians due to their sharp spines.

Variiegated (striped) cultivars are available. Native to southwest U.S.

Yucca baccata   
BANANA YUCCA
(*Y. arizonica*). Stiff, erect, bluish green leaves are 1 inch wide and 2 feet long. Single plants grow to 3 feet high and to 5 feet across. Forms stemless clumps with 2 to 6 rosettes. The fleshy green to purple, bananalike fruits 4 to 6 inches long are edible. Prefers well-drained soil. Native to southwest U.S.

Yucca elata   
SOAP TREE YUCCA
Refined, deep green leaves are almost grasslike. They are 1/2-inch wide but grow to 4 feet long, with threadlike fibers on the margins. As leaves grow in dense clusters at the tops of the trunk, the dead, golden to brown leaves cling tightly to the trunk, shading the plant. It is slow growing and rarely branches, reaching 6 to 20 feet high and 8 feet wide. Roots contain saponins





that can gently clean fine textiles. Native to Arizona and New Mexico.

Yucca gloriosa
SPANISH DAGGER



Rosettes of bluish green, stiffly upright leaves are fleshy and grow to 2 feet long and 2 inches wide. This is a clumping yucca that grows at a moderate rate to 10 feet high. Plant base becomes woody with age. Leave the tidy dead leaves in place—they help keep the plant cool. Native to southeastern U.S. from North Carolina into Florida.

Yucca pallida
PALE-LEAF YUCCA



Pale blue-green leaves are flexible, and measure 1 inch wide by 1 foot long. This unusual yucca has finely serrated leaf margins that can be marked with light yellow to white. A clumping yucca, individuals reach 1 to 2 feet high and spread from 1 to 3 feet wide. With ample water, clumps can get large, with up to 30 rosettes. Native to north central Texas.

Yucca recurvifolia
PENDULOUS YUCCA



(*Y. pendula*). Plants grow rapidly to 6 feet high. Dark, gray-green leaves with a bluish cast are 3 feet long and 2 to 3 inches wide.

They have soft tips and a relaxed, pendulous nature. Solitary plants grow to 6 feet high and as wide. Trim off dead leaves for best appearance. Accepts shade. Native to southeast U.S.

Yucca rigida
BLUE YUCCA



Powder blue leaves are stiff and sharp tipped, to 2 feet long and 2 inches wide. The solitary plants reach 12 feet high and spread to 5 feet wide. Older leaves dry and press against the trunk to help conserve water. This thatch should be left in place. Striking coloration and bold form make the blue yucca an outstanding accent plant. Native to northern central highlands of Mexico.

Yucca whipplei
OUR LORD'S CANDLE



Slender, bluish gray-green leaves are 1 1/2 feet long and 3/4 inch wide. They radiate from the base to form an attractive rosette 2 feet high and 3 feet across. Like agaves, this yucca flowers once and dies, but generally a few pups (small plants) around the base insure the plant's long-term survival in the landscape. Native to California, Arizona and Baja California.

Above left (top): *Yucca recurvifolia*, pendulous yucca.

Above left (bottom): *Yucca pallida*, pale-leaf yucca.

Above center: *Yucca rigida*, blue yucca.

Above: *Yucca elata*, soaptree yucca.

ORNAMENTAL GRASSES

LUSH & EFFICIENT.

Ornamental grasses are often overlooked elements in a lush, water-efficient landscape. This is a shame, because grasses add such diversity and texture. They can soften the rigid outlines of cacti and succulents, and reinforce the arching, fountainlike theme offered by ocotillo or vase-shaped trees. Grasses also add color, depending on the species and season. Some have striking fall foliage, while others have persistent seed heads that dangle like golden ornaments for several months.

Ornamental grasses need only two things from the homeowner: regular water to help keep them looking good, and a “haircut” once each year in late winter.



Festuca glauca

BLUE FESCUE



(*F. cinerea*). A blue-gray, ornamental grass, growing in roundish tufts to 1 foot high, spreading to less than 1 foot wide (photo opposite, bottom left). Plants create an interesting pattern in borders or in the foreground of taller perennials and shrubs. Seedheads rise above clumps in the fall, creating a shaggy effect. Will not tolerate wet, poorly drained soil. Native to Europe.

Imperata cylindrica

‘Rubra’

JAPANESE BLOOD GRASS



Forms upright clumps 1 to 2 feet high, spreading to 1 foot wide. Leaves emerge green in spring and redden as the weather warms. Best color occurs in a sunny exposure. This cultivar rarely flowers. Spreads by underground runners. Native to Japan.

Muhlenbergia

capillaris

PINK MUHLEY



Plant this traffic stopper for its graceful, fluffy, purple to pink plumes. They put on a show of color in late summer and fall. Locate plants where the sun will backlight the flower heads. Grows 3 to 4 feet high and as wide. This large size makes it excellent for large home landscapes and public areas such as golf courses. Native to Texas and northern Mexico. ‘Regal Mist’ is a popular cultivar (photo opposite, top left).

Muhlenbergia

emersleyi

BULL GRASS



Graceful, evergreen leaves clump to 4 feet high or more with equal spread. Delicate, loose, reddish flower plumes reach a foot or two above the leaves in the fall. As they age they turn a cream color. Ideal among boulders (photo opposite, top right). Prefers afternoon shade in the Coachella Valley. Native to Texas.

Muhlenbergia

lindheimeri

LINDHEIMER MUHLEY



Strong vertical form with slender leaves. Large clumps reach 5 feet high and as

wide. Dense, fluffy, golden plumes evoke a dwarfish version of pampas grass. Accepts some shade. Native to Texas. An improved cultivar is ‘Autumn Glow’.

Muhlenbergia rigens

DEER GRASS



This workhorse grass becomes a graceful, fountain-shaped mound 3 to 4 feet high, spreading 4 to 5 feet wide. Lush, rich green foliage is a softening element in the landscape. Slender, upright flower spikes 1 foot above the foliage in fall make a striking contrast to the curving mound (photo below). Accepts some shade. Native to southwestern U.S.

Nassella tenuissima

MEXICAN THREAD GRASS



(*Stipa tenuissima*). A fine-textured, billowy grass that forms upright clumps 2 feet high and as wide (photo below). Even a mild breeze will stir the leaves and delicate seed heads, adding motion to the landscape. Outstanding in a mass planting. Accepts some shade. Native to New Mexico.

Pennisetum

setaceum ‘Rubrum’

RED FOUNTAIN GRASS



Forms a large, dense clump 5 feet high and as wide with medium-textured foliage and coppery seed heads. The species has become a rampant pest in parts of the U.S. Before seeds mature, cut off flower heads, place them in a plastic bag and throw them away to prevent reseeding. However, ‘Rubrum’ only occasionally sets seeds (photo opposite, bottom right). Native to tropical Africa.

Below left: *Nassella tenuissima*, Mexican thread grass.

Below right: *Muhlenbergia rigens*, deer grass.



PERENNIALS

LUSH & EFFECTIVE

Perennials are plants that live for more than one year, although many thrive for decades. They are primarily grown for their flowers, but some do double duty as ground covers or even shrubs. Most are easy to grow in containers—just provide them with a well-drained soil. For a new landscape or a major renovation, perennials are excellent choices for the color and interest they add in a short time.

Gardeners living in the Coachella Valley have a wide selection of perennials to chose from—both cultivated varieties as well as native wildflowers. Selections of each are described here.





DESERT MARIGOLD



WOOLLY YARROW



ASPARAGUS FERN 'MYERS'



LILY-OF-THE-NILE



COLUMBINE

Botanical Name Common Name	How to Grow Water, Sun, Temp.	Description Mature Size Flowers Bloom Season
<i>Achillea tomentosa</i> WOOLLY YARROW	(10°)	Grows 1 to 2 feet high with gray-green leaves. Large delicate flowers on long stems may be salmon, yellow, lavender or white. Locate where plants will receive afternoon shade in a rich, organic soil. Cut back winter-dormant plants for regrowth the following spring.
<i>Agapanthus orientalis</i> LILY-OF-THE-NILE	(15°)	Produces large clusters of blue flowers on 2-foot stems surrounded by dark green, straplike, evergreen leaves. Fleshy roots store moisture. Effective in containers as well as in a natural garden design. Locate where plants will receive afternoon shade; they burn in summer sun in low desert.
<i>Aquilegia hybrids</i> COLUMBINE	(0°)	Produces large clusters of blue flowers on 2-foot stems surrounded by dark green, straplike, evergreen leaves. Fleshy roots store moisture. Effective in containers as well as in a natural garden design. Locate where plants will receive afternoon shade. Attracts hummingbirds.
<i>Artemisia schmidtiana</i> ANGEL'S HAIR	(20°)	'Silver Mound' is low growing to 1 foot high with interesting, silvery gray, fernlike evergreen leaves. Excellent for rock garden or borders, especially in contrast with brightly colored flowers. Prefers a sunny exposure.
<i>Asparagus densiflorus</i> ASPARAGUS FERN	(24°)	'Sprengeri' has small leaves on arching branches, forming a rich, fluffy, bright green mound. Use as ground cover, border, filler or in containers. Accepts exposure ranging from shade to full sun. 'Myers' is similar but more refined with dense, clean, plumelike stems.
<i>Asparagus macowanii</i> MACOWAN ASPARAGUS FERN	(25°)	(<i>A. myriocladus</i> , <i>A. retrofractus</i>). Tufts of rich, green, threadlike foliage resembles billows of green smoke. Many long, slender stems 1-1/2 to 2 feet long rise in clumps that form tuberous roots. Plant in shade only. Makes a nice backdrop to colorful annuals.
<i>Asparagus setaceus</i> FERN ASPARAGUS	(25°)	(<i>A. plumosus</i>). A vigorous plant with small, dainty, lacy, fernlike leaves that are deep green. Good cut foliage for indoor arrangements. Climbing, vining growth or use as ground cover. Plant in shade only.
<i>Baileya multiradiata</i> DESERT MARIGOLD	(10°)	Grows 1 to 1-1/2 feet high, with bright yellow, daisylike flowers that bloom almost continuously from spring to fall on tall stems. Woolly gray leaves form a clump to 6 inches high. Cut back in winter to stimulate new growth and flowers in spring. Reseeds readily. Seeds attract birds.
<i>Bergenia crassifolia</i> SIBERIAN TEA	(10°)	Forms clumps to 1-1/2 feet high and 2 feet wide. The large, round leaves have wavy edges. Rose, lilac or purple flower spikes to 18 inches high bloom in January and February. Use as edging or ground cover in shade.



CHOCOLATE FLOWER



LANCE-LEAF COREOPSIS



SHASTA DAISY



MARGUERITE



'ZAGREB' COREOPSIS

Botanical Name Common Name	How to Grow Water, Sun Temp.	Description		
		Mature Size	Flowers	Bloom Season
<i>Berlandiera lyrata</i> CHOCOLATE FLOWER	10°	To 1-1/2 feet high with 2-foot spread. Sprays of flowers in shades of yellow bloom spring to early summer and produce a fragrance similar to chocolate. Flower heads expand in morning, drooping in afternoon. Leaves are green above, whitish underneath—combine with other gray-leaved plants.		
<i>Centaurea cineraria</i> DUSTY MILLER	10°	Compact growth to 2 feet high. Velvety white leaves have broad, roundish lobes. Solitary flower heads are purple or yellow. Plant in full sun. Good soil drainage important. Be aware there are several different plants known by the common name dusty miller.		
<i>Cerastium tomentosum</i> SNOW-IN-SUMMER	0°	Grows to just 4 to 6 inches high with soft, whitish gray leaves. Small white flowers to 3/4-inch across bloom late spring into summer. For good contrast combine with green-foliaged plants. Trim spent flowers and tired stems at least once each year after flowering.		
<i>Chrysanthemum frutescens</i> MARGUERITE	20°	A perennial but typically grown as an annual in the Coachella Valley. It reaches 2 to 3 feet high and as wide, becoming almost shrublike. Available in white, yellow or pink flowering forms, each offset by bright green divided leaves. Plant from October through February for spring flowers into April.		
<i>Chrysanthemum X superbum</i> SHASTA DAISY	-20°	(<i>C. maximum</i>). White ray flowers surround yellow disks. The stem is straight or slightly branched and the basal leaves are deeply toothed. Plant from containers in spring or fall. Attractive in borders and as cut flowers. Divide plants every two years to develop more vigorous growth.		
<i>Clivia miniata</i> KAFFIR LILY	25°	Orange flowers bloom in clusters on stout stems to 2 feet high in early spring. Leaves of Belgian hybrids are wider, dark green. For best flowers, let them grow undisturbed, forming large clumps. Great container specimen.		
<i>Coreopsis lanceolata</i> LANCE-LEAF COREOPSIS	10°	Plants grow to 2 feet high with yellow daisylike flowers on long stems that bloom spring into early summer. 'Early Sunrise' grows to 1-1/2 feet high with double golden yellow flowers. Coreopsis are great border plants or cut flowers. Plant in full sun in regular garden soil.		
<i>Coreopsis verticillata</i> 'ZAGREB' COREOPSIS	10°	Grows to 1 foot high and about 2 feet wide. Golden yellow flowers bloom on tall stems, contrasting nicely with bright green leaves. Flowering season is long—late spring to fall. Birds, including goldfinches, are attracted to the seeds.		
<i>Dicliptera resupinata</i> DICLIPTERA	22°	Grows to 2 feet high and as wide. Rose-purple flowers bloom from May through October. Use in small garden areas such as patio or courtyard. Trim back after cold weather just prior to spring to renew growth. Dark green heart-shaped leaves are 1 inch long. Plant in well-drained soil.		



PURPLE CONEFLOWER



BUTTERFLY IRIS



GREEN GOLD



GOLDEN DYSSODIA

Botanical Name Common Name	How to Grow Water, Sun Temp.	Description		
		Mature Size	Flowers	Bloom Season
<i>Dietes bicolor</i> PEACOCK FLOWER	(25°)	Plants grow from rhizomes to 2-1/2 feet high with stiff, upright leaves. Lemon yellow flowers with maroon spots bloom for several months during the warm season. Moderate water use, but more flowers with more moisture.		
<i>Dietes vegeta</i> BUTTERFLY IRIS	(25°)	<i>(Moraea vegeta, M. iridoides)</i> . Similar to <i>Dietes bicolor</i> . Evergreen perennial from rhizomes to 2 feet high with stiff upright leaves. Small, white, irislike flowers bloom spring to fall. Accepts full sun to partial shade.		
<i>Dyssodia pentachaeta</i> GOLDEN DYSSODIA <i>(Thymophylla pentachaeta)</i>	(10°)	Small-scale perennial, growing to just 6 inches high and 1 foot wide. Medium green, needlelike leaves are the perfect backdrop to profuse, bright yellow, daisylike flowers that bloom spring into fall. Not fussy about soil. Combines well with cacti and succulents, or tucked into rock gardens.		
<i>Echinacea purpurea</i> PURPLE CONEFLOWER	(15°)	Purple cone-shaped flowers are long lasting and a favorite in a natural garden design. Grows 2 to 4 feet high and 2-1/2 feet wide. Accepts most soils but does need full sun. Grows easily from seed and competes well with grasses. Native to prairies in midwestern U.S.		
<i>Euphorbia milii</i> CROWN OF THORNS	(35°)	Perennial that doubles as an accent. This relative of poinsettia is shrublike with thorny stems. Clusters of red flowers bloom most of the year. Accepts heat. Drought tolerant, but better appearance with regular summer irrigation. Great in containers.		
<i>Euphorbia tirucalli</i> PENCIL BUSH	(35°)	Leafless plant grown for its unusual, pencil-thick branches with see-through patterns. Sap is irritating to people and animals. Many gardeners grow them in containers so plants can be moved to a frost-free location during cold weather.		
<i>Euryops pectinatus</i> 'Viridis' GREEN GOLD	(27°)	Forgiving evergreen perennial that is often used a small shrub. 'Viridis' is an improved selection. Grows 3 to 4 feet high with fine-textured, deep green leaves. Yellow daisylike flowers to 2 inches across bloom fall into early winter. Good container plant. Tolerates a-wide range of climates.		
<i>Evolvulus ruttalianus</i> HAWAIIAN BLUE EYES	(20°)	Grows to 2 feet high or more. Bright blue, daisylike flowers with yellow centers bloom for several months during the warm season. Use in containers, borders or as a color accent. Accepts full sun, even in the Coachella Valley.		
<i>Gaillardia X grandiflora</i> BLANKET FLOWER	(15°)	This plant is a hybrid of <i>G. aristata</i> and <i>G. pulchella</i> . It flowers continuously from spring to frost. Striking red and yellow flowers are set off by glossy green leaves. Plants range in size from less than 1 foot to 4 feet high, depending on the selection. Many easy-to-grow varieties are available.		



BLACKFOOT DAISY



GAZANIA



DAYLILY



ANGELITA DAISY



CORAL BELLS



GAURA

Botanical Name Common Name	How to Grow Water, Sun Temp.	Description		
		Mature Size	Flowers	Bloom Season
<i>Gaura lindheimeri</i> GAURA	10°	Grows 1 foot high, spreading up to 1-1/2 feet wide. Frilly white to pink flowers bloom on tall spikes summer into fall. Cut plants back in winter to encourage new, healthy growth. May be sold in nurseries as butterfly flower.		
<i>Gazania hybrids</i> GAZANIA	15°	Grows 1 to 3 feet high with gray-green leaves. Large delicate flowers on long stems may be salmon, orange, yellow, lavender or white. Locate plants where they will receive afternoon shade. Plant in a rich, organic soil. Cut back winter-dormant plants for regrowth the following spring.		
<i>Gypsophila paniculata</i> BABY'S BREATH	0°	'Bristol Fairy' is an improved selection, growing to 3 feet high. Large loose clusters of tiny, double white flowers bloom profusely through summer on bluish green stems. Heat tolerant.		
<i>Hemerocallis hybrids</i> DAYLILY	0°	Both evergreen and deciduous hybrids are available. Plants form a clump of slender arching leaves. Flowers in clusters bloom at the ends of tall stems midspring to early fall. They resemble lilies and come in many colors, including yellow, orange, red and many pastel shades.		
<i>Hesperis matronalis</i> DAME'S ROCKET	0°	Produces purple and white flowers similar to those of phlox, borne in loose heads at ends of the stems. Flowers are fragrant, especially at night. Plants grow 2 to 3 feet high. Locate in full sun or partial shade in moist, well-drained soil. Easy to grow from seed.		
<i>Heuchera sanguinea</i> CORAL BELLS	0°	Grows 6 to 12 inches high with rounded leaves. Flowers are borne in clusters in coral, reddish pink, white or crimson and bloom on top of 1- to 2-foot stems. Locate in partial shade in fertile, well-drained soil.		
<i>Hymenoxys acaulis</i> ANGELITA DAISY	10°	Grows 1 foot high and as wide in a rounded clumping form. Profuse numbers of golden yellow, daisylike flowers on stems above medium green leaves bloom throughout the year. Tuck into small spaces among boulders, or combine with cacti and succulents. Best with afternoon shade.		
<i>Lavandula stoechas</i> SPANISH LAVENDER	15°	The most heat-tolerant lavender, growing 3 to 4 feet high with an equal spread. Mounding plants have blue-green foliage, complementing lavender-blue flower spikes that bloom in late spring and summer. Flowers and foliage are fragrant. Plants accept some shade, prefer it in the afternoon.		
<i>Melampodium leucanthum</i> BLACKFOOT DAISY	0°	Spreading, mounding, ground cover perennial grows 1 foot high and up to 2 feet wide. White daisylike flowers with yellow centers bloom throughout the year. Does best in well-drained soil and with afternoon shade. Great choice to include in a natural garden.		



FIRECRACKER PENSTEMON



PAPERFLOWER



WHITE EVENING PRIMROSE



TEXAS PAPERFLOWER

PARRY'S PENSTEMON

Botanical Name Common Name	How to Grow Water, Sun Temp.	Description		
		Mature Size	Flowers	Bloom Season
<i>Nierembergia caerulea</i> DWARF CUP FLOWER	(30°)	Low-growing, reaching 8 to 10 inches high. Flowers are 1 inch long, bell-shaped, in rich blue to violet or white. Plant in fall or winter for flowers in summer. Best with afternoon shade or in partial shade in well-prepared soil. Remove spent blooms, which encourages more flowers.		
<i>Oenothera caespitosa</i> WHITE EVENING PRIMROSE	(5°)	Evergreen with large, gray-green leaves and masses of large, 4-inch white flowers. Blooms on and off throughout the year but most prolific in spring. Plants form rounded clumps 1 to 1-1/2 feet high, spreading 3 feet wide. May die out in summer if overwatered. Reseeds readily.		
<i>Penstemon baccharifolius</i> ROCK PENSTEMON	(5°)	Growth is different than most penstemons in that it is more shrublike to 2 feet high. 'Del Rio' is an improved selection, with cherry colored flowers blooming spring through fall. Loved by hummingbirds. Provide good soil drainage to prevent root diseases.		
<i>Penstemon eatonii</i> FIRECRACKER PENSTEMON	(0°)	This plant is among the first to bloom in early spring. Tubular scarlet flowers appear on 3- to 4-foot stems above basal growth to 2 feet high and as wide. Plant in full sun—a shady location can cause plants to sprawl. Best in well-drained soils. Reseeds readily. Attracts hummingbirds.		
<i>Penstemon parryi</i> PARRY'S PENSTEMON	(18°)	Tall, strongly vertical, 3- to 5-foot stems show off flowers in shades of pink. Widely adapted to desert regions. Accepts full sun but better with filtered or afternoon shade in low desert. Plant in soil with good drainage. After flowers set seed, cut back to top of leaf rosette.		
<i>Penstemon pseudospectabilis</i> CANYON PENSTEMON	(0°)	Grows 1-1/2 to 2 feet high with typical penstemon rosette form. In spring, tubular flowers in shades of purple appear above the basal growth on stems to 2 feet high. Plant in full sun—a shady location can cause plants to sprawl. Best in well-drained soils. Reseeds readily. Attracts hummingbirds.		
<i>Penstemon superbus</i> SUPERB PENSTEMON	(15°)	One of the largest penstemons, growing to 2 feet high and up to 3 feet wide. Brilliant, coral colored, tubular flowers bloom on tall stems in late spring. Best in well-drained soils. Accepts some shade. Reseeds readily. Attracts hummingbirds.		
<i>Psilostrophe cooperi</i> PAPERFLOWER	(10°)	Plants grow 1 foot high, spreading to 2 feet wide. Evergreen foliage is gray-green. Yellow, daisylike flowers about 1 inch in diameter cover plants for long periods spring through fall. Will accept partial shade. Don't overwater; combines well with cacti.		
<i>Psilostrophe tagetina</i> TEXAS PAPERFLOWER	(-20°)	Shrubby evergreen that covers itself with bright yellow flowers from spring through summer and late fall. Growth is mounding to 1-1/2 feet high, spreading to 3 feet wide. After the blossoms dry and turn papery, they maintain their yellow color. Locate in full sun to partial shade.		



BLACK-EYED SUSAN



GLOBE MALLOW



LICORICE MARIGOLD



MEALY CUP SAGE



SOCIETY GARLIC



MEXICAN HAT

Botanical Name Common Name	How to Grow Water, Sun Temp.	Description		
		Mature Size	Flowers	Bloom Season
<i>Ratibida columnaris</i> MEXICAN HAT	10°	Wildflower perennial, growing to 2 feet high and as wide. Plant in masses for best effect and to enjoy the interesting yellow or maroon flowers. They bloom at tips of long stems, the petals draping downward, surrounding dark cones in the flower's center. Blooms spring to fall.		
<i>Rudbeckia hirta</i> BLACK-EYED SUSAN	-10°	Plants grow to 3 feet or more high. Large, showy, yellow-orange flowers are excellent for cutting and bloom all summer and into fall. Plant in full sun in almost any soil, spring to late fall. Cut back after bloom period. Can be grown as an annual with a fall sowing.		
<i>Salvia farinacea</i> MEALY CUP SAGE	-10°	Grows 1-1/2 to 2 feet high with an equal spread. Violet-blue flower spikes bloom for a long period through summer. Effective planted in masses. Best in full sun. Native to New Mexico and Texas. Attracts hummingbirds.		
<i>Salvia X superba</i> BLUE QUEEN SAGE	10°	Compact plant to 12 inches high produces deep blue flower spikes from early summer until frost. Attractive when planted in masses. Best in full sun location with regular summer irrigation. Deadhead spent flowers frequently to increase flower production.		
<i>Sphaeralcea ambigua</i> GLOBE MALLOW	5°	Shrubby wildflower perennial that grows to 3 feet high and as wide. Coarse-textured leaves are gray-green. Small, cup-shaped flowers bloom in spring. They come in many colors; the species is orange. Be careful while handling plants—they can irritate eyes and skin of some individuals.		
<i>Tagetes lucida</i> LICORICE MARIGOLD	20°	A fall bloomer with flowers that are similar to mountain marigold, <i>Tagetes lemmonii</i> , but growth habit is more compact at 3 to 4 feet high. Leaves emit a scent of anise. Midsummer pruning controls growth and helps produce stronger stems to support flowers. May go dormant in winter.		
<i>Tulbaghia violacea</i> SOCIETY GARLIC	0°	Rosy lavender flowers bloom in large clusters in spring and summer; their long-term beauty help make up for the plant's garlic scent. Flowers bloom on tall stems well above leaves, and foliage develops into large clumps. Grow in well-drained soil. Cut back in early spring to renew growth.		



MOSS VERBENA



VERBENA SPECIES



DESERT ZINNIA



PRAIRIE ZINNIA



CALIFORNIA FUSCHIA

Botanical Name Common Name	How to Grow Water, Sun Temp.	Description		
		Mature Size	Flowers	Bloom Season
<i>Verbena peruviana</i> PERUVIAN VERBENA	(0°)	Forms a low, dense, evergreen mat of dark green foliage 4 to 16 inches high. Plant in full sun, 18 inches apart for ground cover. Puts on spectacular displays of brilliant, crimson-red or pink flowers spring through fall. Look for 'Lipstick', purple flowers; 'Red', red flowers; 'St. Paul', pink flowers.		
<i>Verbena pulchella</i> MOSS VERBENA	(20°)	(<i>Verbena tenuisecta</i>). Low-growing ground cover verbena to 1 foot high, spreading to 3 feet wide. Fine-textured dark green leaves serve as background to purple flowers in clusters. They bloom spring to fall. Attracts butterflies.		
<i>Verbena rigida</i> SANDPAPER VERBENA	(0°)	(<i>Verbena venosa</i>). A vigorous grower from 12 to 20 inches high with dark green, rough-toothed leaves. Stems support lilac to purple-blue flowers in clusters summer and fall. Like most verbenas, plants perform better if their leaves remain dry. Irrigate with drip system rather than overhead sprinklers.		
<i>Zauschneria californica</i> CALIFORNIA FUSCHIA	(10°)	Upright stems 8 to 12 inches high form a mat composed of small gray to green leaves. Bright orange-red or white tubular flowers are borne in clusters at ends of stems early summer through winter, which are loved by hummingbirds. Can become invasive if regular moisture is available.		
<i>Zephyranthes candida</i> RAIN LILY	(20°)	Grows 1 foot high and as wide in a clumping form with thin, upright leaves. White star-shaped flowers typically bloom following summer rains. Also consider <i>Zephyranthes grandiflora</i> , a similar species with pink flowers.		
<i>Zinnia acerosa</i> DESERT ZINNIA	(10°)	Grows less than 1 foot high, spreading to 1 foot wide. White daisylike flowers are small but bloom for a long period—spring into fall. Excellent mounding plant to spread amongst rocks and boulders. Accepts tough conditions and low water.		
<i>Zinnia grandiflora</i> PRAIRIE ZINNIA	(0°)	Grows 1 foot high and as wide. Spreads to fill in nooks among rocks and boulders. Flowers are yellow to orange, similar in appearance to desert zinnia, with a bloom period from summer to fall. Flowers attract butterflies. Accepts some shade.		

ANNUALS

LUSH & EFFICIENT.



Gardening with Annuals

The vibrant colors of flowering annuals, lined up in containers, pots and packs at the nursery, tempt us each spring and fall. Each variety of these *bedding plants*, as they are called, looks appealing and we want to take all of them home to add to our gardens. But it's a good idea to design and prepare planting beds before purchasing plants. Keep in mind that most annuals are high-water-use plants. For this reason, it's a good idea to use them in up-close areas near patios or entries. Annuals are also excellent in containers.

Getting Ready to Plant

Planting at the right season can be the difference between success or failure. Ideal times to plant winter- and spring-blooming annuals are when night air temperatures range between 40°F to 60°F, and daytime air temperatures are 60°F to 80°F. Daytime soil temperatures should be about 75°F. These conditions generally occur from mid-October through November.

Add organic soil additives to planting beds and mix thoroughly to 6 inches deep. Do this several weeks before planting. Bypass this step for desert natives. Moisten beds to 12 inches deep.

New plantings can quickly become stressed if winds are strong or temperatures rise suddenly. Be aware of the weather and water new plants carefully. In fast-draining, sandy soil, moisture must be supplied regularly for plants to grow and remain healthy. Neglect will cause hardening of tissues and loss of plant health or life. Check the soil often to determine if plants need water.

Soil-borne organisms have plagued new plantings of petunias and vincas when they have been planted in the same location, year after year. Prevent by removing leaf debris from planting beds, discard dead or dying plants and keep plants growing vigorously at all times. Rotate plantings—don't always grow the same kind of plant in the same bed. Try something new each planting season. Contact your nursery for current disease controls.

Planting Wildflowers

Many wildflowers are included in the Annuals charts on pages 130 to 135. Including wildflowers in your landscape takes a little planning, but is worth the effort. Follow these few simple guidelines for preparation and planting.

In order of preference, fall, winter and early spring are suitable for sowing seed of spring-blooming species. Plant summer-flowering varieties during the spring.

Almost any sunny location (at least six hours of sun each

day) is a candidate for wildflowers. Wildflowers native to the desert are, by their nature, better equipped to cope with our climate and soil conditions than water-demanding species introduced from other regions. However, like other plants, even tough desert natives require regular moisture to germinate seeds and establish seedlings.

Wildflower mixes adapted to grow in the low desert are available for Coachella Valley gardeners. Individual species also work well. It is a matter of preference as to what effect

you are looking for. If you create your own combination, select wildflowers that bloom at the same time. Consider planting them in separate beds to create distinct bands of colors. Over time, wildflower plantings take on their own character as plants reseed, spread and reseed some more.

Sow seeds for spring-blooming annuals in the fall. Seed mixtures typically contain six or more species to ensure a long season and a variety of color. A 1-ounce seed packet will cover approximately 500 square feet.

Prepare the planting area by removing weeds and debris prior to cultivation. Rake lightly to create a seed bed. Soak the soil

slowly to moisten 8 to 12 inches deep.

Broadcast seeds with a hand-held fertilizer spreader or by hand. Most wildflower seeds are very small. Mixing with fine dry sand provides more even distribution, and allows you to see where seeds are being applied. Don't plant seeds too deep. Most wildflowers do best with 1/8-inch coverage of soil, but read the seed package to be sure.

After seeding, rake soil lightly in a criss-cross pattern to cover seeds. Water lightly with a fine mist attachment on the hose. Avoid washing soil or applying so much water at one time that it creates gullies and runoff. Water seeded areas regularly until seedlings appear. After seeds sprout, apply water a couple of times each week, depending on moisture content of soil. Pull weeds as they appear.

Adding fertilizer is seldom necessary. Most desert wildflowers do well in soils having low fertility.

Germination periods vary considerably for different wildflowers, and are affected by soil and air temperatures. Some may sprout in two weeks, others take four to six weeks. Adequate deep moisture is essential.

After plants complete their flowering cycle and go to seed, cut them back to about 6 inches high. With some wildflower species, you can collect seeds for next year's planting. Some seeds will have been eaten by birds or otherwise lost. To ensure another season of color, reseed with about half as much as the original planting in the fall. Note that spring seeding for summer annuals will require more moisture compared to fall-seeded plants. Perennial species will usually continue into the following year.





SNAPDRAGON



PERIWINKLE



CALENDULA



BACHELOR'S BUTTON

Botanical Name Common Name	How to Grow		Description		
	Water	Sun, Plants/Seeds	Mature Size	Flowers	Bloom Season
<i>Ammi majus</i> BISHOP'S FLOWERS		Seeds Fall			This plant is similar in appearance to Queen Anne's lace, growing to 3 feet high. White flowers bloom in summer, set off by finely dissected leaves that have toothed margins. Excellent cut flower. Plant in full sun in almost any soil. Easy to start from seed.
<i>Antirrhinum majus</i> SNAPDRAGON		Plants Fall			Tall, 1- to 1-1/2-foot "tetra" forms do best when staked early in their life to support stems. Dwarf types 6 to 18 inches high are ideal for massing and in borders. Colorful cut flowers. Plant mid-October to February. Plants bloom well into spring with regular water and monthly fertilizer.
<i>Calendula officinalis</i> CALENDULA		Plants Spring			Flower colors range from bright yellows to deep orange, with best appearance in late winter and early spring. Growth is vigorous to 18 inches high. Long-lasting cut flowers. Plants tend to sprawl. Space 15 to 18 inches apart.
<i>Catharanthus roseus</i> PERIWINKLE VINCA		Plants Spring			(<i>Vinca rosea</i>). Profuse flowers from spring into summer, and often into fall. Many flower colors, including white, red, pink and magenta. Most selections grow 12 to 15 inches high but smaller forms are available. Plant in late spring. Feed with diluted liquid fertilizer monthly.
<i>Centaurea cyanus</i> BACHELOR'S BUTTON		Seeds Fall			Grows to 2 feet high and almost as wide. Blooms from late spring to fall. The foliage is gray-green with blue, wine, rose, pink or white flowers at the end of the stems. Accepts full sun to partial shade. Reseeds easily. Grows in almost any soil.
<i>Cheiranthus cheiri</i> WALLFLOWER		Seeds Fall			Grows to 2 feet high. Fragrant flowers bloom in shades of yellow and red. Plant in full sun and in soil with good drainage. Easy to grow from seed. Wallflower is rarely considered a wildflower but is added to wildflower mixes because it does well in meadows, favored for its bright colors.
<i>Chrysanthemum X morifolium</i> CHRYSANTHEMUM		Plants Fall			This is the garden-variety chrysanthemum, also known as florist's chrysanthemum. Plants may survive for years. They are available in a wide range of flower colors, growing 1 to 1-1/2 feet high. Accepts some shade.



INDIAN BLANKET



DIANTHUS



CALIFORNIA POPPY



COSMOS

Botanical Name Common Name	How to Grow Water, Sun, Plants/Seeds	Description		
		Mature Size	Flowers	Bloom Season
<i>Clarkia amoena</i> FAREWELL-TO-SPRING		This annual wildflower grows to 2 feet high with slender stems that support cup-shaped flowers in shades of pink, lavender or red. Several flowers often bloom on a single flowering stalk. Easy to grow from seed, but does not do well in humid climates when temperatures climb above 80°F.		
<i>Collinsia heterophylla</i> CHINESE HOUSES		The name Chinese houses comes from the arrangement of the plant's flowers, which look like miniature pagodas. Violet or white flowers bloom spring to early summer. Will grow to 2 feet high in full sun or partial shade. Tolerates most soil conditions.		
<i>Cosmos bipinnatus</i> COSMOS		Open and airy color plant, with soft fernlike leaves and daisylike flowers in pink, red or white. Plant form is informal to 3 to 5 feet high so locate in the back of a natural border. Easy to grow from seed. Plant in moderately rich soil in full sun location in fall or early spring.		
<i>Delphinium species</i> LARKSPUR		A perennial that is treated as annual in the Coachella Valley. Blend one cup of bone meal into planting soil before planting. Position plant crown slightly above ground level so it will remain dry. Protect from heavy winds and add 4-foot stakes early on to support tall flower stems.		
<i>Dianthus species</i> DIANTHUS		Treat as an annual in the Coachella Valley. Colors range from white, pink, red, purple and shades between. Flowers have a delightful, spicy fragrance; enjoy in bouquets. Best in enriched, well-drained soil. Stake early to support tall flower stems. Accepts full sun to partial shade.		
<i>Eschscholzia californica</i> CALIFORNIA POPPY		California poppy is the state flower of California. Orange to yellow, cup-shaped flowers bloom on 12- to 18-inch stems from spring into early summer. Plants reseed readily. Sow seed where you want plants to grow. Does not like soil that is continuously moist or overly rich.		
<i>Gaillardia pulchella</i> INDIAN BLANKET		Often used in western region wildflower seed mixes for its aggressive growth. Plants grow to 1-1/2 to 2 feet high. Long slender stems are topped with 2-inch red, yellow and gold flowers. Easy to grow from seed. Plant in soil with good drainage. Blooms from midsummer to frost.		



TIDY TIPS



MAXIMILIAN SUNFLOWER

GERANIUM



SWEET PEA

Botanical Name Common Name	How to Grow		Description		
	Water	Sun, Plants/Seeds	Mature Size	Flowers	Bloom Season
<i>Geranium species</i> GERANIUM		Plants Spring			Geraniums are treated as annuals in low-elevation desert regions and are ideal container color plants. Accepts full sun or partial shade but requires well-drained soil. Enjoy the spring flowers then move containers into shade as the warm season comes on in late April and May.
<i>Gilia capitata</i> BLUE THIMBLE FLOWER		Seeds Spring			Plants grow to 2 feet high with tall, slender stems. Blue pin-cushion flowers bloom from summer to fall. Leaves to 4 inches long are finely dissected, adding a light airy feeling to plants. Accepts full sun to partial shade. Easy to grow from seed. Sow in place in early spring.
<i>Helianthus maximilianii</i> MAXIMILIAN SUNFLOWER		Seeds Spring			A perennial grown as an annual in the Coachella Valley. Tall flower stalks to 6 feet high or more are topped with familiar sunflower flowers in fall. Place at back of border due to plant height. Accepts some shade and most soil conditions. Birds love the seeds.
<i>Lasthenia glabrata</i> GOLDFIELDS		Seeds Fall			An annual wildflower that grows 6 to 24 inches high. Slender stems are topped with small yellow flowers from spring into summer. Excellent for fast temporary cover and color. Often included in western wildflower mixes; competes well with grasses. Use for revegetation and stabilization.
<i>Lathyrus odoratus</i> SWEET PEA		Plants Fall			Sweet peas are available in a wide range of colors. Blooms late winter through spring. Dwarf types excel in flower borders or in planters. If you start with seeds, soak them in water for several hours before planting. Plant in well-prepared soil, and provide supports for plants to climb.
<i>Layia platyglossa</i> TIDY TIPS		Seeds Fall			Wildflower annual with yellow daisylike flowers tipped with white. They are 1 to 2 inches across and showy, blooming on plants to 1 foot high. Flowering begins in early spring and can last for several months. Grows best in well-drained soil in full sun or partial shade.
<i>Linaria maroccana</i> TOADFLAX		Seeds Fall			An annual wildflower growing 1 to 2 feet high. Flowers in mixed colors look like snapdragons. Blooms spring to summer. Grows easily from seed. Prefers light shade. For best show of color, sow seed in large quantities. Reseeds to come back the following spring.



LOBELIA



TEXAS BLUEBONNET



SWEET ALYSSUM



SCARLET FLAX

Botanical Name Common Name	How to Grow Water, Sun, Plants/Seeds	Description		
		Mature Size	Flowers	Bloom Season
<i>Linum grandiflorum</i> 'Rubrum' SCARLET FLAX		This annual wildflower grows rapidly 1 to 1-1/2 feet high, producing brilliant, scarlet flowers at ends of tall stems. Plant in well-drained soil in fall; it will not tolerate soggy soil during the cool season. Accepts full sun to partial shade. Blooms from spring into midsummer. Reseeds readily.		
<i>Linum perenne</i> subsp. <i>lewisii</i> BLUE FLAX		This annual wildflower produces a breathtaking bouquet of dazzling, sky-blue flowers that have a satiny sheen. They open every morning then fade in the afternoon heat. Plants grow to 2 feet high with a light, airy, vase shape that allows them to blend well with other wildflowers.		
<i>Lobelia erinus</i> LOBELIA		Popular and dependable border plant or cover for bulbs, grown for late winter and spring bloom. Flowers are usually light blue to violet with contrasting throats in white or yellow. Grows 6 to 8 inches high. Plant in rich, improved soil. Can reseed with good growing conditions.		
<i>Lobularia maritima</i> SWEET ALYSSUM		An easy-care annual that is an excellent companion to bright-colored annuals or perennials. Grows 6 to 8 inches high in white, rose or purple. Easy to grow from seed or set out plants from packs fall to early spring. Locate in sun to partial shade. Cold hardy.		
<i>Lupinus densiflorus</i> var. <i>aureus</i> GOLDEN LUPINE		An annual wildflower native to California. Showy, spiked, pealike, golden flowers stand high above the leaves, blooming early spring to early summer. Plants grow to 2 feet high. Sow seed in full sun in fall for flowers the following spring. Prefers well-drained soil.		
<i>Lupinus texensis</i> TEXAS BLUEBONNET		This annual wildflower is the state flower of Texas, and announces spring with sweeping masses of blue-plumed flowers along roadsides and in meadows. Plants grow 1 to 2 feet high. Germination can be sporadic but may be increased by purchasing scarified (scratched) seed.		
<i>Matthiola incana</i> STOCK		A dependable garden annual featuring fragrant flowers in a range of colors. Grows 1-1/2 to 2 feet high with an equal spread late winter to early spring. Makes a fine background for smaller annuals. Plant in well-drained soil improved with amendments in full sun to partial shade.		



PETUNIA



FORGET-ME-NOT



OWL'S CLOVER



CALIFORNIA BLUEBELL

Botanical Name Common Name	How to Grow			Description		
	Water	Sun	Plants/Seeds	Mature Size	Flowers	Bloom Season
<i>Myosotis sylvatica</i> FORGET-ME-NOT			Seeds Fall			This annual produces numerous, small, blue or sometimes pink flowers that bloom in spring. Plants grow 6 to 15 inches high. Prefers regular moisture and slightly acid to neutral soil. Accepts full sun to light shade. Easy to grow from seed.
<i>Nemophila maculata</i> FIVE SPOT			Seeds Fall			Flowers of this wildflower are the same as baby blue eyes, below, but are white with vivid purple spots at the tip of each petal. Grows to just 6 inches high, spreading 12 inches or more wide. Accepts most soils, including heavy clay or sand. Attractive when planted in drifts.
<i>Nemophila menziesii</i> BABY BLUE EYES			Seeds Fall			This wildflower grows 6 to 10 inches high with delicate, sky blue flowers marked with white spots. Best with moderate water in shaded areas. Avoid planting in hot or humid conditions. Start from seed either in spring or fall. A prolific bloomer that will reseed itself.
<i>Orthocarpus purpurascens</i> OWL'S CLOVER			Seeds Fall			Reliable wildflower for fast cover and color from early spring into summer. Suited to a natural border or in a wildflower mix. Grows to 8 inches high with rose-pink to purple, plumelike flowers that resemble clover. Sow seed in early fall in full sun to partial shade location. Reseeds well.
<i>Papaver rhoeas</i> FLANDERS FIELD POPPY			Seeds Fall			Large, showy flowers in many bright colors on plants 2 to 4 feet high. Provide light, well-drained soil, moderate water in a full sun to partial shade location. Prefers open areas and competes well with grasses. Sow seeds in fall or early spring.
<i>Petunia hybrids</i> PETUNIA			Plants Fall			Petunias are the most colorful of all annuals in desert gardens, and are available in a wide range of forms and flower colors. Prefers sun but accepts partial shade. Mix pellet-type fertilizer into soil when planting. Check soil moisture often; overwatering can lead to disease problems.
<i>Phacelia campanularia</i> CALIFORNIA BLUEBELL			Seeds Fall			Prolific-blooming wildflower with rich blue, bell-shaped flowers in early spring to early summer. Plants grow 6 to 18 inches high with lush-looking, dark green, fragrant, heart-shaped leaves. Accepts most soils but performs best in rocky soils with good drainage. Reseeds itself.
<i>Phlox drummondii</i> ANNUAL PHLOX			Seeds Fall			Low growing, to 6 to 12 inches. Best planted in a mass or in a color border. Soft flower colors come in mostly shades of salmon, pink, yellow and white. Accepts full sun to partial shade. Plants and flowers hold up well to late spring and early summer heat. Reseeds well.



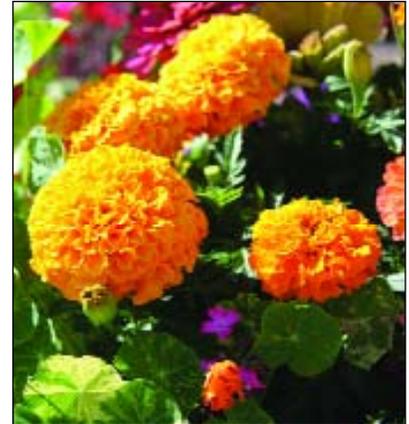
MEXICAN SUNFLOWER



ZINNIA



VIOLA



MARIGOLD

Botanical Name Common Name	How to Grow		Description		
	Water	Sun, Plants/Seeds	Mature Size	Flowers	Bloom Season
<i>Primula malacoides</i> FAIRY PRIMROSE		Plants Fall	Adds splashes of color in shaded or partially shaded locations. Delicate-textured leaves are pale green, oval, to 3 inches long. They grow in rosettes close to ground. Vertical flower stems 8 to 10 inches high bloom in spring in shades of white, pink, red and mauve. Best in improved soil.		
<i>Silene armeria</i> CATCHFLY		Seeds Fall	Summer-blooming wildflower, when most annual wildflowers are well past their peak. Pink to lavender flowers are borne in tight clusters on small bushy plants to 2 feet high. The individual flower petals are deeply notched. Accepts full sun to partial shade in almost any soil.		
<i>Tagetes erecta</i> MARIGOLD		Plants Spring	Valuable summer color plants. Select from a wide range of flower forms in yellows and oranges. Dwarf, 8- to 12-inch types are ideal in borders; taller 18-inch varieties look best behind low border shrubs. Keep plants growing continuously with regular water and fertilizer.		
<i>Tithonia rotundifolia</i> MEXICAN SUNFLOWER		Seeds Fall	Grows up to 6 feet high and to 3 feet wide. Large, orange or yellow sunflower blooms put on a show from midsummer until frost. Like Maximillian sunflower, use in back of the border. Attracts hummingbirds and swallowtail butterflies.		
<i>Verbena hybrids</i> VERBENA		Plants Fall	Colorful annual border plants, growing from 8 to 12 inches high. Available in a range of flower colors, including white, red, pink, blue and purple. After flowering, trim spent blooms for regrowth. Plant in fall to enjoy late winter-spring flowers.		
<i>Viola cornuta</i> VIOLA		Plants Fall	At home as a low, 6- to 9-inch border along walks, in front of mixed plantings and in containers. Flowers come in white, blue, yellow and apricot. Does well in sunny to partially shaded locations. Flowers profusely until heat arrives in late spring. Accepts temperatures as low as 28°F.		
<i>Viola X wittrockiana</i> PANSY		Plants Fall	Reliable annual for winter and spring color. Many selections are available in a wide range of flower colors. Grows 6 to 8 inches high. Best in a warm microclimate. Enrich soil with blood meal before planting and feed monthly. Cut back plants lightly March to April to renew growth.		
<i>Zinnia elegans</i> ZINNIA		Plants Spring	One of the best annuals for summer color. Flowers come in a range of bright colors, and are large—up to 6 inches across. Dwarf types grow as low as 6 inches; taller types can be as much as 3 feet high. 'Profusion' series grow 1-1/2 to 2 feet high. Flood-irrigate or use drip irrigation.		



◆ CHAPTER FOUR ◆

Landscapes & Special Gardens



Mild winters and ample sunshine are trademarks of the Coachella Valley, allowing a wide range of plants to be grown successfully. In this chapter, you'll find detailed information on many types of gardens and plants, including roses, citrus, fruits, vegetables and lawns. You'll learn how to handle specific kinds of garden situations, such as landscaping around pools and patios, creating a wildlife habitat, and how to grow plants in containers. In addition, you'll find a detailed guide to help you give your garden an extreme makeover—creating a lush, attractive, water-efficient landscape.

Planning Your Landscape

It is difficult for the majority of first-time desert residents to develop a plan of action for their new landscape. When you consider that they are working with unfamiliar plants in growing conditions that seem downright hostile, this makes perfect sense! But that is the reason for this book. With careful understanding of each plant's character and mature size, and with some thoughtful planning, a pleasing landscape will emerge. No matter what size your yard, following some basic guidelines can show you how to plan and install a water-conserving landscape you'll be sure to enjoy.

First, draw a base plan of your lot that shows the location of home, walks, patios and driveway slabs—all areas of hardscape that exist on your lot. (These hardscape areas should be in place before beginning any landscaping.) In addition to walks and patios, there may be a need to construct walls for privacy or as a windbreak. Note these as well.

On your plan, note items such as utilities and access for trash receptacles. Include any landscape plants or existing features that you want to keep. Making a scale drawing on graph paper is ideal, but even a sketch of available space provides a snapshot of what exists, and a starting point.

Make several copies of this base plan. Now is the time to try out your ideas. Draw in all the different plants and gardens you might like, such as a vegetable garden, herb garden, shade trees, fruit trees, vines or even a fountain.

Above: Consider creating a wildlife garden that will attract butterflies. This butterfly is gulf fritillary.

Left: Creating a low-water landscape that is lush and colorful begins with a good design, followed by selecting adapted plants.

Consider functional spaces within your yard as well, such as an area for a barbecue grill, seating for entertaining, or space for a pool or spa.

If you are interested in growing vegetables or flowers, consider constructing narrow raised beds. Make them wide enough to provide a seating ledge—useful when planting, weeding and harvesting.

Consider adding a change of elevation for interest, such as natural-shaped earth mounds, a raised planter against the back wall, or a dry creek bed to follow a slope. All will help set the stage for wildflowers, ground covers and accent plants.

Visit retail nurseries and botanical gardens for ideas on the plants you want to include. Choose plants for their seasonal color, beauty, hardiness to cold, ultimate height and spread and water requirements. Research trees carefully, and know how much space you have available for their mature height and spread. Maintenance requirements, including the amount of litter they typically create, are other important aspects.

Before you even think about digging planting holes, mark the locations of major plants with stakes. A garden hose or heavy string can be used to outline proposed planting beds. Spend some time in the yard to be sure that the proposed layout works for you. Go inside and look out your windows to imagine how the plants will

look from that important viewpoint.

Adequate soil drainage is necessary to avoid areas of standing water in the landscape. Make the soil level next to hardscape areas 2 inches below grade.

Plan an irrigation system and layout after you determine plant locations. Drip irrigation with automatic valves will water plants where and when they need it, reducing your water bill. (See pages 26 to 41.)

Plant properly. See page 16 for step-by-step guidelines. Allow correct amount of space between plants and hardscapes. Take into account their full mature growth even if plantings appear sparse at first. You can always add annuals and perennials as temporary filler for a year or two until trees and shrubs begin to assert themselves.

Making a Small Landscape

Less *can* be more. Even if you live on a small lot with limited garden space, it can still be as beautiful and enjoyable as a garden in a large lot, with less maintenance chores. Many of the same trees, shrubs, vines, ground covers, annuals and perennials that grow successfully in large-scale gardens are compatible in smaller planting locations. Just be sure you take into account mature plant sizes as you do your planning.

Due to the smaller area, gardening solutions must



This inviting home entry is composed of an attractive combination of water-efficient plants.

be more creative. Trees or shrubs that you can *espalier*—train against a wall or fence—provide one option. Especially consider the use of vines for getting the most out of garden space. They can be trained up fences and walls to surround your home with color and cooling greenery, taking up little ground area.

Giving Your Old Landscape a Makeover

Even if it has only been five years since your landscape was installed, many new, beautiful, water-efficient shrubs, trees, accent plants, ground covers and bright flowering perennials are available in a wide range of colors and growth habits. Ornamental grasses, as well, are becoming more popular. They, too, are available in a range of sizes and colors, their leaves and seedheads creating interesting flowing patterns. (See pages 118-119.) Vertical accent plants, many of which are succulents, add their own brand of new visual impact. See Cacti and Succulents, pages 106 to 117, for an array of choices.

If you have a front lawn, consider replacing it with interesting, natural-shaped contours and mounds planted with water-efficient flowering shrubs, perennials and ground covers. Add some boulders, a few accent plants, and some low-water flowering perennials. Now your once-common, monochromatic green grass yard is

a visual feast for the eye. And it will use about half the water as the lawn.

You can also choose to retain some lawn, but reduce its size. This will cut back on water outlay, as well as time spent fertilizing, mowing and otherwise maintaining it.

Bordering lawn with a clean edge can enhance the overall appearance of your landscape and give it a finished appearance. The contrast of rich green grass against light-colored mulch such as decomposed granite or soil can be highly attractive.

Follow the steps outlined in Planning Your Landscape, page 137. Doing a makeover of an established landscape requires a thorough review of the site. This includes noting existing problems, then developing a theme or plan—including a budget—before beginning work.

Include in your calculations how much longer you intend to live in your home. If you plan on staying three years or more, be more expansive with your makeover. If you will be selling your home in less than three years, it's probably more economical to tidy up the landscape, get rid of clutter, eliminate glaring problems and maintain it to its potential.

To develop a complete review for a potential makeover, it may be worth the services of an experienced landscape designer or landscape architect. A profes-



Low-water and low care: Bright green myoporum ground cover combines with magenta bougainvillea in the background.

sional can define the scope of work, develop a time frame and prepare a budget.

As part of the makeover, evaluate the worthiness of all plants that are on site. Trees especially should be carefully reviewed. Are they healthy? Is their height and spread in proportion to the available space? Are limbs rubbing against structures, or are roots uplifting walks or walls? Are they well-adapted to the desert environment? Consider other plants as well. Have shrubs and ground covers become woody? Has continual pruning all but eliminated flowering? Are there any plants on site that you simply do not like?

Some Makeover Solutions

- It is not always wrong to remove a tree, especially if it is causing problems. Trees in poor condition, problem trees, trees planted in the wrong place, or trees at the end of their life span should be removed.
- Remove worn out evergreen shrubs and replant with desert-adapted flowering shrubs and perennials.
- Upgrade flower beds with small shrubs, also called *subshrubs*, which generally produce more flowers over a longer period. Perennials can also take the place of annual flowers. They produce colorful flowers and are less costly than planting and replanting large beds of annuals several times a year.
- Add in accent plants and low-profile ground covers to create a new, fresh look that also reduces water use.

Replace or reduce the size of large lawns with graceful, flowing plantings of perennials, ornamental grasses and accent plants.

A well-constructed lawn edging contains the lawn and gives definition to lawn and planting beds. Use pressure-treated wood or other landscaping timbers for edging, or durable edges such as metal, brick or concrete. Limiting the lawn perimeter and avoiding small, narrow or oddly shaped sections will make it easier to irrigate and maintain.

Artificial turf has improved in appearance and longevity in recent years. It can be an option to provide a splash of green color to a back yard.

Give your irrigation system a makeover. Replace old irrigation watering heads with more water-conserving equipment. Most PVC pipe irrigations systems can easily be converted to water-saving drip systems. Irrigation, including how to upgrade and maintain an existing system, is discussed on pages 30 to 41.

Landscaping Near Pools and Patios

The areas around pools and patios are some of the most difficult places to landscape attractively and for low maintenance. From a plant's point of view, such locations can be less than ideal for growth. Pools add reflected light and hot concrete decking to the already high heat. Chlorine in pool water may splash on plants,



Boulders combine with brightly colored bougainvillea (center), Murphy's agave (left), and yellow-flowering aloe



Palms are ideal plants near pools. They create a tropical mood and are generally litter-free.



A poolside planter features colorful annuals with upright rosemary as a living centerpiece.

injuring or killing them.

Patios are difficult because a portion of the earth for plant roots is covered by a large, non-porous surface. But there are still ample plants available for these sites, especially if you follow a few guidelines.

To avoid constant problems with sweeping, raking and cleaning, select and plant low-litter plants. All plants will produce some amount of litter, but some plants are messier than others. The descriptions in *Plants for Desert Success* often lists whether a plant is high or low on the litter scale.

Swimming Pools

The landscape around a pool becomes more appealing when you use plants that are dramatic in form, texture or color. Avoid using plants with thorns, as well as those that produce high litter.

Palms are among the most favored trees for around pools. Consider trying some newer selections, such as *Brahea armata*, Mexican blue palm, or *Brahea edulis*, Guadalupe Island palm. Both are slow growing and typically remain under 20 feet high.

Tried and true is *Washingtonia filifera*, California fan palm. It grows slowly to 35 to 40 feet, with a massive trunk up to 3-1/2 feet in diameter. *Washingtonia robusta*, Mexican fan palm, has a slender, 18-inch trunk that can reach 50 to 75 feet high. This height makes it a skyline tree and should only be used in large-scale gardens.

For smaller gardens and for close-up viewing, consider *Chamaerops humilis*, Mediterranean fan palm. It is typically multi-trunked growing 8 to 12 feet high. Growth is slow. Welcome the *pups*, offshoot plants, that fill in around the base. Leave them on the palm to encourage growth to develop more vertically. This palm

is also excellent when grown in containers.

Although palms are popular, there are a number of other evergreen trees and shrubs that are attractive around pools. Consider *Acacia aneura* or *Acacia craspedocarpa*, two low-litter species from Australia. *Acacia willardiana*, palo blanco, is native to Mexico. It will accept reflected sunlight and heat near pools and adds a graceful, weeping-willow-like feel, as does *Callistemon viminalis*, weeping bottle-brush. *Olneya tesota*, desert ironwood, *Sophora secundiflora*, Texas mountain laurel, and *Pistacia lentiscus*, evergreen pistachio, are additional trees to consider for poolside plantings.

In planting areas near a pool, it becomes both functional and visually appealing to use creeping ground covers. Select species that root along the branches, which helps stabilize the soil to keep it from blowing into the pool. Include some taller accent plants to partner with the ground cover to create more interest. Add a few boulders or statuary to complete the scene.

Especially attractive ground covers for poolside landscapes include *Chrysactinia mexicana*, damianita, *Convolvulus cneorum*, silver bush morning glory, *Oenothera stubbeii*, Saltillo primrose, *Ruellia brittoniana* 'Katie,' dwarf ruellia, and the creeping evergreen herbs, *Rosmarinus officinalis* 'Prostratus', prostrate rosemary, and *Teucrium chamaedrys* 'Prostratum', prostrate germander.

Many lush, flowing ornamental grasses are at home around pools, especially as a backdrop. Consider *Muhlenbergia* species, which are attractive almost year-round, and are low-litter plants.

High-litter plants to avoid include oleander, bougainvillea, pyracantha, eucalyptus, ash, pines, privet, mesquite and palo verde. If you want to include these

plants for shade, screening, or other functions, try to place them 25 to 35 feet away, ideally on the downwind side of the pool.

For a final touch, install night lighting on palms and bold accent plants to enhance the pool landscape. The play of light reflections on plants and water add to the beauty of the scene.

Patios

A patio can be a wonderful place to sit and enjoy your yard. There is nothing comparable to relaxing on your own patio with a morning beverage and the paper, with birds singing in the colorful shrubs around you. Come back to the patio in the evening and enjoy the company of friends as you grill some steaks for dinner. The patio should be designed so that it is another room of your home.

Creating intimacy in a large or small patio merits close attention to detail when selecting and placing plants. A patio area provides an opportunity to become your private mini-oasis. In general, you want to select plants that have colors and textures that are appealing when viewed up close.

Flowering vines, espaliered plants and fragrant color plants in containers add special interest at the edges of the patio area. If the rest of your garden is low maintenance, these are prime locations to showcase plants that you enjoy the most: a small herb garden, vegetables in containers, or special tropical or subtropical plants.

Beds at the edges of the patio can be filled with flowering perennials or annuals to add their bright, gem-like effects. Also consider bonsai plants for their up-close appeal. While you want planting beds near the patio, where you can most enjoy them, you also want sufficient space for walkways and paths to reach other parts of the yard. Also factor in easy access to other features, such as table and chairs, grill, pool or spa.

Water Features—Pools and Fountains

The cooling sight and relaxing sound of water simply can not be surpassed as a finishing touch to a landscape. This is especially true in a desert climate, where water is precious. And if you enjoy statuary, you can include some in even the smallest garden as part of a water feature.

Water features can be formal, such as a Spanish-style fountain, or informal, like a natural-appearing waterfall and pool. Select the style that blends the best with the rest of your landscape.

The style of water feature (formal or informal) dictates the type of plants placed around it. A formal feature should be landscaped with plants that remain tidy with little care, such as junipers or myoporum.

For an informal water feature, surround with free-form plants. Vertical forms can provide accents among rock groupings near your water feature. Larger plants include *Muhlenbergia lindheimeri*, Lindheimer muhley; *Hesperaloe parviflora*, red hesperaloe; *Diets vegeta*, butterfly iris; and *Dasyilirion longissimum*, toothless sotol. Smaller plants include *Nassella tenuissima*, Mexican thread grass; *Zephyranthes* species, rain lilies; and *Bulbine frutescens*, bulbine.

For fillers in the background, try the fascinating gray foliage of *Buddleia marrubifolia*, woolly butterfly bush, combined with the silvery gray foliage of *Encelia farinosa*, brittlebush. Offset these with the brilliant green foliage and bright flowers of *Salvia greggii*, autumn sage. All are sun-loving and water-efficient, and blend well with other desert plants.

Not to be forgotten are cacti and other succulents. They can be tucked in many places in the landscape. Smaller species can be used among rocks and boulders to provide miniature desert scenes for close-up viewing. Larger ones can be placed farther away for charming accents.

Small Lawns for Landscapes

Reducing an existing lawn area or making new lawns smaller than typical in the past helps curtail water use. Yet even a small lawn provides an important surface for play and visual relief from the earth tones of the desert. If you do have a lawn or are planning one for a new landscape, ask your nursery or sod grower about the current crop of water-conserving lawngrasses and how to water and maintain them.

In the Coachella Valley, the most easily grown grasses are the permanent, warm-season Bermudagrasses. They are seeded—common Bermuda only, or sodded—hybrids, such as the ‘Tif’ series. Hybrid Bermudagrass provides a close-knit carpet that wears well. Its seed is sterile, so it must be planted from sod or stolons. Some hybrid varieties are slow growing so less frequent mowing is required.

Hybrids are fast becoming the favorites, due to their finer texture and richer color. Indeed, some communities do not permit common Bermudagrass plantings due to its multiple problems. Common Bermudagrass readily goes to flower, producing highly allergenic pollen. It also reseeds, and is an aggressive spreader, becoming a weedy, invasive nuisance in other plantings. Color and texture are not as attractive. Hybrid Bermudagrass is highly preferable.

Many types of grasses have been tested, but, to date, few show much promise. Buffalograss from Texas and northern Mexico may have the potential to be a high-

quality, warm-season turf with better winter color than Bermudagrass, eliminating the need for overseeding in winter. However, it is not yet commonly available.

Overseeding a Winter-Dormant Lawn

Bermudagrass is a warm-season grass that becomes dormant with cold temperatures. It turns a straw color, but most folks prefer a green lawn. Our choices for green lawn in winter then become cool-season grasses. Sowing cool-season grass seed over a dormant Bermudagrass lawn, called *overseeding*, allows the gardener to have a green, thriving lawn all year-round.

One of the main gardening chores in the low desert is the annual exercise of overseeding Bermuda lawns with ryegrass. Thousands of acres of lawns in parks, on golf courses and around homes go through this ritual each fall—when soil temperatures are 72°F to 78°F. This usually occurs October 1 to October 15. During this time annuals, perennials and bulbs are also planted for winter and spring color.

Annual ryegrass and perennial ryegrass are the most common cool-season grasses used for overseeding. Annual rye grows rapidly, however, its ample growth demands more frequent mowing. Annual ryegrass leaves tend to be weaker and a lighter green color. It is less expensive than perennial rye. Perennial rye grass

has greater vigor and develops more sturdy, spreading growth. Germination period for both types is generally 3 to 10 days, depending on moisture coverage.

Other grasses such as rough-stalked bluegrass and bentgrass are used on golf greens for putting surfaces. These fine-bladed grasses require much more maintenance than the rye grasses. Ask your cooperative extension or local nursery about the finer points of selecting a grass that will work best for your lawn situation.

Container Gardening

Container plants on your desert patio, at the entrance to your home or around the pool can play a personal or even sentimental role. In these areas you can showcase your favorite plants, and enjoy them at close range. These include plants that offer interesting structure such as bonsai plants, as well as colorful annuals, bulbs and fragrant flowering perennials or even shrubs.

The portable container garden can move with you from one home to another, and, if placed on casters, containers can be moved according to the weather or the season. Move them out of the range of extremes in cold weather in winter, or to a shaded location as the heat and sun intensity increases in the summer.

Containers are a wonderful way to enjoy a diversity of plants even if you live in a small lot. Large containers



Bordering a lawn with a clean edge can enhance your landscape, giving it a finished appearance. This lawn is small and requires much less water and care than a traditional wall-to-wall lawn, yet it still provides cool, green relief.

can function as a screen or as a way to divide a garden or outdoor area. Containers are also a good way to raise plants to a height that is easier to work with, especially helpful for folks that have trouble bending and crouching. When it comes to vegetable gardening in containers, the dreaded chore of weeding is dramatically reduced. Plus many vegetable plants have an attractive, ornamental quality that you can be showcased in a container.

Where you place your containers is entirely dependent on the need of sun or shade for each plant. If containers are mobile, you can move them as needed to protect plants from frost, wind, reflected heat and intense sunlight.

Container Choices

Select containers that are best adapted to deal with problems associated with our desert heat.

Containers can be porous, which allows evaporation of moisture through the sides. Porous materials include unglazed clay, terra cotta or wood. Care must be taken that these types do not lose moisture too rapidly during warm periods of the year. However, if you water plants regularly, porous containers are more forgiving than non-porous ones.

Non-porous containers include those made of porcelain, glazed ceramic and plastic. They allow less

evaporation through the sides. It is easier to overwater these types of containers because evaporation of water is reduced. All containers must have a drainage hole or you run the risk of killing the plant with constantly saturated soil, which greatly reduces oxygen.

Soil for Containers

Most container plants are generally forgiving when it comes to soils. A quality, general-purpose soil mix is one-third ground bark, peat moss, or composted planter mix, one-third coarse sand, and one-third garden soil. Blend all three into a loose, friable mixture and moisten before you plant. Many brands of packaged mixes are available at nurseries and garden centers.

Succulents, particularly cacti, need good drainage and generally less acidic soil. Use a mixture of one-third garden soil, one-third porous matter such as perlite or vermiculite, and one-third sand.

Despite what many of us were taught years ago, new research shows that it is detrimental to plants to put anything other than soil into pots. Do not put stones, gravel, pots shards or anything in the bottom—it actually harms drainage. If you feel you must cover the drainage hole, use a piece of old window screen or nylon stocking.

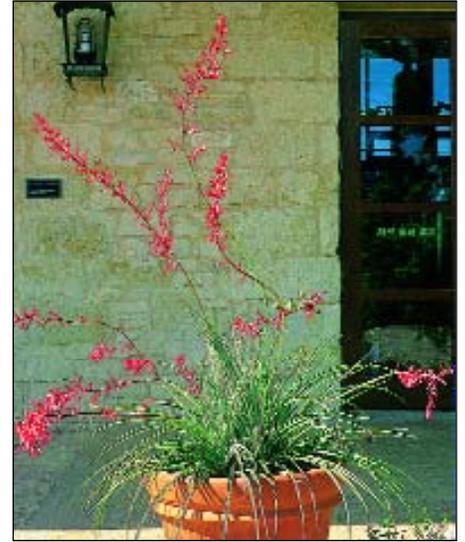
Leave space at the top of the container—one to three inches—depending on the size of the container and plant type. This allows room for each watering. With



The portable container garden can move with you from one home to another. These containers are filled with colorful annuals and perennials, including white sweet alyssum, pansies and foxtail fern, *Asparagus* Myers.



This demonstration garden shows a simple, yet effective method of using drip irrigation to water container plants.



Red yucca, *Hesperaloe parvifolia*, makes a dramatic, container speci-

each irrigation, water should flow through the soil mix on new plants as well as saturating the root ball of established plants.

If water is flowing out of the container bottom too rapidly, there may be soil shrinkage due to excessive root growth. Water is not penetrating the rootball, but merely moving around and down the sides of the container, doing the plant little good. When this occurs, it's time to replant with fresh soil in a larger container.

Top-dressing the container soil is an option. Top-dressing is any inert material in a 1- to 2-inch layer over the soil in pots. Pea gravel, small lava rock or smooth stones are topdressing materials. It reduces evaporation, prevents crusting of the soil, reduces water splash and improves appearance.

Fertilizer must be furnished more frequently for plants in containers than for those in the ground. Measure and apply carefully according to label directions. Liquid types of organic fertilizers work best. Moisten soil prior to application and water it in. Don't overdo fertilizer thinking "a little more" will help. Overfertilizing kills plants. For cacti and succulents, use fertilizer at half strength.

Container Plants

Containers can be used to house a single plant, or become a miniature garden with a number of different plants. Ideally you should match colors and shapes of pots to the plants you place in the container.

For a pleasing blend of plants, the adage is "accent, filler, and spiller." There should be an upright accent plant in the center, filler around it, and a spiller cascading over the edge. This can be done with any plants that share the same water requirements. Use succulents,

perennials, annuals, bulbs or an enticing blend of vegetables and herbs.

Containers are the most effective way to enjoy certain plants that are otherwise not candidates for growing in the desert. For example, some plants require acid soils and do not adapt well to treated soils. These include camellias, gardenias and azaleas. They generally do better in porous pots that evaporate through the sides.

Containers are also ideal for some species of bulbs that are unable to survive hot soils, including Dutch tulips, daffodils, and hyacinths. Note that the Turkish tulips do fine in the desert garden.

Succulents, including cacti, are a special part of the desert landscape. The majority are highly adapted to container culture. Most have fascinating shapes, textures and colors, making them ideal to collect and showcase in containers.

Vegetable Gardens

The Coachella Valley offers a wonderful climate for growing vegetables and fruits. Indeed, fruits and vegetables are grown commercially in the valley and shipped throughout the world. Growing conditions for vegetables are most favorable during fall, winter and into spring. Summer vegetables are more difficult to grow, but with the right heat-loving varieties and proper cultural practices, gardeners can be successful.

If you are a new gardener or new to the desert, it is best to begin with a fall garden. Gardening in fall is more forgiving without the extreme summer heat, and you're more likely to enjoy harvests that will be tasty and abundant. Keep in mind that even winter-grown gardens need irrigation on a regular basis.

Ideally, plan on *succession planting* your garden



Winter vegetable gardens—cool-season crops—are usually more successful than summer gardens because plants avoid intense heat. This planting of assorted lettuce varieties is not only bountiful but highly attractive.

vegetables. This means sowing new seeds or setting out young plants every three weeks or so, not all at once. This will stagger and extend harvest times and avoid having an overabundance of produce all at one time.

It is possible to grow many vegetables in a small plot, in containers, in borders or along a wall or fence. Select an exposure where vegetables will receive at least six hours of sun every day.

Prepare soil well in advance of planting. Remove rocks, weeds and debris, then grade to create a smooth, level, ready-to-plant bed. Moisten soil to about 2 feet deep. Add ample organic material such as compost or forest mulch and mix thoroughly. Or, consider a raised bed garden surrounded by a low wall. You can sit and work in the garden, making it easier to plant, irrigate, thin seedlings, remove weeds and harvest crops.

When sowing seeds directly into the garden, be aware that each seed has a preferred planting depth. You'll find directions on seed packets. Don't plant too deep.

After planting seeds, tamp the soil firmly. Water seeds to remove air spaces in the soil. Use a fine-mist sprinkler or hose attachment to avoid disturbing or washing out seeds. Continue to sprinkle soil lightly on a regular basis until seeds germinate and seedlings produce three or four leaves. Now begin watering with a soaker hose or irriga-

tion system. Check the soil for moisture several times a week. Dig down at least 6 inches deep and feel if the soil is moist. Be consistent with watering. A dry period can slow down or interrupt the growth process, which will likely reduce the amount and quality of harvests.

Planting a Winter Garden

The time to begin planting a winter garden is mid-September. The soil is warm and cooler temperatures that are soon to come are ideal for growing green leafy vegetables and root crops such as beets, carrots, endive, leeks, lettuce, green onions, radishes, spinach, turnips, broccoli, bok choy, pak choy, Brussels sprouts, cabbage, chard, mustard and peas. This is also the time to grow cool-season garden herbs such as cilantro, chives, parsley, dill and fennel.

Planting a Summer Garden

Beginning in early February, you can plant many of the warm-season crops—onions, garlic, potatoes, tomatoes, sweet corn, squash, gourds, eggplant, sweet or bell peppers, chili peppers and melons. The prime summer herb is basil. Many summer vegetables are handsome plants, and can be mixed into flowerbeds.

Plant seeds or set out young tomato, pepper and

eggplants after all danger of frost has passed. In the Coachella Valley the average dates for the last frost can range from late January to early March, but the official date is March 1. Seedlings and plants in 4-inch pots are usually available at local nurseries during this time, ready to plant. A word of caution: don't set out a large number of plants. Just a few plants of most vegetables will produce enough harvests for the average home.

Because intense heat is coming all too soon, plant varieties that are early maturing and heat tolerant. Native varieties of crops, rather than hybrids, often do better. A number of seed companies are now providing desert-adapted varieties of common vegetables.

Fruits—Trees and More

A wide variety of fruit- and nut-producing plants grow well in our desert, and can be done without an extensive orchard. Many landscape trees, shrubs or vines will also provide you with delicious harvests. Select from apricot, citrus, date, elderberry, fig, grape, olive, peach, pear, pecan, persimmon, pistachio, plum, pomegranate and exotic tropicals such as guava, pineapple guava, natal plum, loquat (Japanese medlar), and jaboticaba. (Avocado is tropical as well but may not survive our periodic freezes.) A number of native plants provide edible fruit, including prickly pear, cholla, squawberry, wolfberry, saguaro and velvet mesquite, the pods which can be ground into a sweet flour.

Deciduous Fruit Trees

Deciduous trees, those in which leaves drop from branches in winter, are often placed in the background of the landscape. Although it is an excellent energy-saving practice to locate deciduous trees along a south-facing wall for summer cooling of the home, only do so with figs and pomegranate from the list following.

Figs—Silvery gray bark and lush green leaves place figs at the top of the list for an oasis landscape. If your landscape space is limited, figs can be espaliered. There are ten commonly grown varieties of figs, and all do well in the Coachella Valley. Selection then becomes a matter of taste.

'Mission' is the most dependable, all-around fig, typically producing two crops per year. Fruit has black skin. Use fresh, dried or preserved. 'Kadota' has yellow skin and amber pulp. Fruit is good when dried. 'Brown Turkey' is best eaten fresh.

Peaches and Nectarines—Select from low-chill varieties of peaches such as 'Blazing Gold', 'Gold Dust', 'Desert Gold' and 'Babcock.' They ripen early and produce reasonable crops. Also consider 'Party News Four Stars,' which produces in mid-season. Dwarf 'Bonanza

Peach' eventually reaches 6 feet high. Its mature size is suited to border areas, or even grow it in a large container. Old favorites such as 'Elberta', or 'J. H. Hale' are not adapted to our low desert climate.

Nectarine varieties with low-chilling requirements include early fruiting 'Desert Dawn', 'Gold Mine' and 'Sunred'.

For all peaches and nectarines, prune to remove two out of every three branches formed the previous year to create new fruiting wood and improved harvests.

Pomegranates—A succulent fruit from ancient times, pomegranates have been grown in low-elevation deserts for many millennia. They tolerate alkaline soils well, and add year-round interest to the landscape. (See page 64.) Spring brings large, vivid red flowers, followed by ruby red fruit against brilliant green foliage. Fall foliage is golden yellow, and in winter, the bare branches and trunks show off their smooth, silver-gray bark.

Full sun is important. Bare-root trees can be planted in December, January and February. Container-grown plants can be set out any time, with fall the best period.

Regular deep irrigation is required for crop production. Selectively prune one-third of the previous year's growth each winter or trees become too twiggy.

'Wonderful' is an improved selection generally grown as a large shrub to 10 feet high and as wide.

Citrus

Citrus trees are abundant in their offerings to desert gardeners, with lush evergreen foliage, fragrant flowers



Pomegranate is a triple-treat plant. It is attractive in the landscape, and produces striking, bright red flowers that are followed by its tasty fruit.

and decorative, tasty fruit. High heat required by most citrus is easily met in the Coachella Valley. Full flavor and juiciness develop better here than almost anywhere.

Planting New Trees

Citrus plants need deep, well-drained soil. In frost-free areas they can be planted any time. In colder parts of the valley, wait to plant in spring after danger of frost has passed (March 15).

When planting more than one tree in an average-sized garden, space grapefruit 20 feet apart; most other citrus 15 feet apart. Plant in the warmest location available—in full sun or with some afternoon shade.

Irrigating Newly Planted Citrus—Build a basin around newly planted plants at least 4 feet in diameter with sides about 6 inches high. For March-planted trees, fill basin and soak soil to 2 feet deep at least twice a week from March to May. Soak to 3 feet deep about twice a week June through September. Extend watering frequency to every 10 to 12 days during winter months. By March the tree can be considered established and can be irrigated as a mature tree.

Irrigating Mature Citrus—After trees are established, maintain a dry area about 12 inches in diameter area around the base of the trunk. Slightly raise the soil level so that the basin tapers down and away from the trunk, preventing water from coming in regular contact with the trunk. This reduces the chance of gummosis, a dis-

ease that can kill plants. Continue to extend the edges of the basin as the tree grows. As a guide, make the basin slightly wider than the spread of branches.

Irrigation depth for citrus is ideally 3 to 4 feet, allowing the soil to become mostly dry prior to watering again. In sandy soils, water trees every 10 to 14 days from March through May. Water once a week from June through September. Water every two to three weeks from October through February. Water less often in heavier clay soils.

If in doubt about how much and when to water, check the soil for moisture. It is simple to check irrigation depth with a *soil probe*. This is a long, metal rod (purchased or handmade) that can be pushed into the soil. It penetrates as deeply as the moisture, stopping when it reaches dry soil.

Mulch materials—bark, planter mix, even rocks and gravel, to name a few, should be applied over the basin area to keep roots cool, reduce water loss through evaporation and to suppress weed growth. A 3-inch layer of mulch will keep roots 8°F to 10°F cooler. This also helps reduce digging or cultivating, which will disturb surface roots. Keep mulch away from trunk to reduce chance of gummosis disease.

If citrus are growing in a lawn, keep grass from growing beneath the tree's canopy. Create a basin, cover with mulch and water deeply, as recommended above. Try to avoid having spray from lawn sprinklers hitting trees.



Valencia orange is one of the easiest citrus to grow. It is primarily used as a juice orange.



Grapefruit are good citrus choices for the Coachella Valley. This is Rio Red.

Fertilizing Citrus

Make the first application of a complete citrus fertilizer in February to help set blossoms. Follow with one application per month until September. At the least, remember to fertilize on these holidays: Easter, Memorial Day, and Labor Day. Apply fertilizer according to product label directions. Dissolve in water or spread dry fertilizer evenly across the watering basin, and water thoroughly after applying.

Pruning Citrus

Remove all dead wood, crossed limbs and control haphazard growth. Pull off suckers rather than pruning them to reduce the chance that they'll regrow. Low-hanging branches around the perimeter of the tree should not be removed. They help the tree shade itself, preventing sunburn of the bark. If the tree is pruned so that the trunk is exposed, whitewash or wrap the trunk to protect it.

Lemons often require more pruning than other citrus due to their rapid and sometimes rampant growth. Heavy pruning may reduce the number of lemons produced, but it may improve the size and quality of fruit. Lemon trees may be pruned to fit the available garden space or kept at 8 to 12 feet high to make it easier to harvest the fruit.

Sun Protection

This is only necessary if trees are pruned too much. To avoid sunburned trunks, wrap with tree wraps or paint trunk with white latex paint diluted with water (50:50 solution).

Fruit Drop

Some immature fruit can be expected to drop after blossoms fall and until fruit becomes 1/2-inch in diameter. Excess fruit drop can be caused by lack of moisture or fertilizer, overfertilization, excessive pruning, sudden change in temperature, freezing, poor soil drainage and insect pests. Avoid these by careful irrigation, prune carefully, control pests and fertilize on schedule. (See Month-by-Month Gardening in the Coachella Valley, pages 21 to 25.)

Frost Damage

Prune a frost-damaged tree only after new growth develops. Following a severe freeze, die-back may continue into late spring and summer. If the tree is heavily damaged, remove the fruit. Water only enough to meet the needs of the tree. Fertilize frost-damaged trees less heavily than healthy trees.

Harvesting Citrus Fruit

Fully ripe citrus will drop into your hand when the stem



A dry creek bed can be used to reduce turf areas, provide an avenue for drainage and create a setting for a natural

is twisted lightly. If you have to tug, the fruit is not yet ripe. If you must, remove fruit by cutting the stem.

Most citrus fruit can be left on the tree for long periods—some for several months. The rind must not be cut or split if the fruit is to be stored. Harvested fruit keeps best at 60°F, or at room temperature out of direct light. If stored in a frost-free refrigerator, plastic reduces withering. Frost-damaged fruit feels hard to the touch and the segments inside are often dry and mealy.

Pest and Disease Control

The average homeowner, even with several citrus trees, will not be much bothered by pests. Encourage insect-eating birds (see Creating a Wildlife Habitat, following) and you may never see a pest outbreak.

Monitor trees for severe infestations of aphids, thrips, scale and whiteflies. If seen in high numbers, you can treat with insecticides. If ripe fruit is on the tree, harvest enough for eating to last at least three weeks before applying any insecticide. A second application may be necessary three weeks later. Most important, use only products labeled for use on citrus, and follow all product label directions.

Gummosis is a bark disease, evidenced by scaly bark and sap flow, most often seen at the base of the tree. It develops after bark is sunburned, in poorly drained soils, or when wet soil remains in contact with the bark. Treat affected trunks by removing scaly bark and rinsing the area with one teaspoon of potassium permanganate diluted in one pint of water. Keep soil and moisture away from the wound.

Chlorosis can be seen when leaf veins remain a dark green and the rest of the leaf turns a pale yellow. It is a good indication the plant is not able to absorb the iron it needs. This can be treated by acidifying the soil beneath the tree with used coffee grounds, or 1 cup vinegar to 5 gallons water. Ideally, address the problem by adding organic mulch. You can also add compost to the soil, but dig up only one sixth of the root zone at a time. In sandy soils, iron may actually be lacking, in which case add iron chelate. A chlorotic condition also can be caused by excessive irrigation, which leaches away fertilizer and other nutrients.

Adding a Dry Creek to your Landscape

Many landscapes, large or small, benefit from the visual interest of a unique landscape feature—a dry creek bed. A dry creek bed identifies the landscape as truly southwest, simulating the arroyos of our local foothills.

This feature has the added benefit of reducing or eliminating lawn areas, provides a means for drainage and creates the backbone and setting of a natural habitat. Properly placed flowering accent plants, small shrubs, ground

covers and wildflowers complement natural placement of pebbles, rocks and boulders.

Begin by creating a meandering swale 1-1/2 to 2 feet deep and 3 to 5 feet wide. Line the bottom and sides with 3- to 6-inch stones bolstered with clusters of 2- to 3-foot diameter boulders along edges. Bury rocks and boulders one-quarter to one-third of their depth for a more natural effect.

Natural areas such as this, with perennials and wildflowers, complement other plantings, and provide color for long periods. Native plants to enhance the feature could include ground covers such as *Calylophus hartwegii*, calylophus; *Dalea greggii*, trailing indigo bush; or *Wedelia trilobata*, yellow dot.

Add some color and varying height with flowers such as *Penstemon* species, penstemon; *Baileya multiradiata*, desert marigold; *Hymenoxys acaulis*, angelita daisy; *Sphaeralcea ambigua*, globe mallow; and *Rudbeckia columnaris*, Mexican hat.

Small shrubs such as *Calliandra eriophylla*, fairy duster; *Cleome isomeris*, bladderpod; *Hyptis emoryi*, desert lavender, and *Ericameria laricifolia*, turpentine bush; work well together, for both their foliage and seasonal flower color.

An added bonus is that many of these plants re-seed readily, reinforcing the natural appearance. The boulders and stones provide plenty of nooks and crannies to encourage seeds to germinate.

In a mature garden, a dry creek bed can help the landscape “flow together,” stimulating and creating a new, exciting look.

Creating a Wildlife Habitat

Every living thing needs water, food and shelter. If you provide these in your landscape, wildlife are sure to come. No matter how distant our urban areas are removed from nature, a surprising selection of creatures will discover your wildlife habitat. It is then that you will discover the magic and mysteries of nature so rich in our desert land. Your entire landscape can become a welcoming place for birds, butterflies and native animals. With proper selection of plants you can enjoy a lush, low-water oasis, wildlife and year-round color.

If you are unsure of how to begin, start small in a corner of your landscape, then expand as you begin to see what works and doesn't work. Include as many plants as possible that are native to the desert. Locate habitat in a quiet part of the garden where trees and plants can grow as they will. Unpruned or lightly pruned forms will provide the food and shelter wildlife seek. Plants that grow naturally, with branches reaching to the ground, are preferred. Their density creates safe places for hiding, resting and nesting.

Water is a necessary element in a wildlife habitat. A water source can be as simple as a dripping faucet, a small, shallow fountain or a shallow water dish, such as a large decorative plant saucer.

Plants can provide food for wildlife without our even noticing it. Nectar, seeds, fruits, and larval food for butterflies are all important in the wildlife garden. Plants also nurture numerous different species of insects that are not pests, yet are important food sources for many species of birds. For example, hummingbirds require insect protein to lay eggs and raise their young. Also their tiny nests will fall apart without ample spider webbing in the construction.

Wildflowers and perennials with deep-throated, brightly colored flowers full of nectar are essential to attract hummingbirds and butterflies. Ground covers such as lantana and verbena are loved by butterflies. Flowers and grasses that produce seeds become dependable food sources for seed-eating birds such as quail, dove and lesser goldfinch.

A bird feeder or two may be fine to interest small birds, but avoid broadcasting great quantities of seed or grain on the ground. This often merely attracts larger birds and pigeons, which can stress the habitat and bird population. It may also attract undesirable rodents and the snakes that prey on them.

As the garden ages, the gradually enriching soil becomes an ideal home for earthworms, lizards and other soil-related animals and insects. They help develop a balanced food cycle for all the residents. And when you create the right environment, roadrunners, quail, thrashers, and other native birds help keep snails, slugs and other pests under control.

The list on this page provides just a sampling of arid land plants to help create your wildlife habitat. Also note plants as you read through *Success with Desert Plants*, pages 43 to 135.



Plant flowering perennials to attract hummingbirds to your garden.

Plants for Wildlife Habitats in the Coachella Valley

TREES FOR SHADE AND RESTING

Acacia berlandieri, Guajillo
Cercidium floridum, Blue Palo Verde
Chilopsis linearis, Desert Willow
Lysiloma watsonii var. *thornberi*, Feather Tree
Olneya tesota, Desert Ironwood
Prosopis velutina, Velvet Mesquite
Vitex agnus-castus, Chaste Tree

SHRUBS FOR NECTAR, SEED AND SHELTER

Anisacanthus species, Desert Honeysuckle
Atriplex canescens, Fourwing Saltbush
Buddleia marrubifolia, Woolly Butterfly Bush
Cleome isomeris, Bladderpod
Calliandra species, Fairy Duster
Encelia farinosa, Brittle Bush
Justicia species, Chuparosa and Shrimp Plant
Punica granatum, Pomegranate

FLOWERS FOR SEED, NECTAR

Aquilegia species, Columbine
Baileya multiradiata, Desert Marigold
Dalea species, Dalea (ground cover forms)
Lantana species, Lantana (ground cover forms)
Penstemon species, Penstemon, Bearded Tongue
Salvia species, Sage
Zauschneria californica, Hummingbird Trumpet
Zinnia acerosa, Desert Zinnia

VINES FOR FOOD AND NECTAR

Campsis radicans, Trumpet flower
Passiflora species, Passionflower
Rosa banksiae, Lady Banks Rose
Tecomaria capensis, Cape Honeysuckle

CACTI AND SUCCULENTS FOR NECTAR AND SEED

Aloe species, Aloes
Asclepias linaria, Threadleaf Milkweed
Asclepias subulata, Desert Milkweed
Carnegia gigantea, Saguaro
Ferocactus species, Barrel Cactus
Fouquieria splendens, Ocotillo
Hesperaloe parviflora, Red Yucca
Opuntia species, Prickly Pear

...AND DON'T FORGET ORNAMENTAL GRASSES
 FOR NESTING MATERIAL.

Glossary

Acid, Acidic

[soil]ÑHaving a pH value below 7. See pH.

Alkaline [soil]ÑA pH value above 7. See pH.

Alluvial [soil, slopes]ÑAreas of young, rocky soils, typically at the bases of mountains.

Alternate [leaves]ÑBorne singly at each node, in a spiral up a stem.

AngiospermÑPlant that has its seeds enclosed in an ovary.

AnnualÑPlant that completes its life cycle in one season or one year.

AntherÑPart of a stamen that produces pollen, usually borne on a filament.

ApexÑTip or growing point of an organ such as a shoot or branch tip.

AquaticÑPlant that grows in water.

ArchitecturalÑPlants that have strong and often spectacular shapes.

BackfillÑSoil that is returned to planting hole to fill in around rootball of plant.

Bare RootÑPlants that are sold without soil around their roots, which occurs when they are dormant. Roses and certain deciduous fruit trees are examples.

Beneficial InsectsÑInsects that prey and feed on insect pests that attack garden plants.

BiennialÑPlant that completes its life cycle in two years, usually flowering and fruiting the second year.

Blow SandÑSand that is blown into an area, propelled by strong winds. Can damage plants and property if wind velocity is too high.

BoltÑTo produce flowers and seed, sometimes prematurely, such as *Òbolt to seed.*

BractÑModified leaves that may take on the appearance of flower petals. Bracts are usually green but can be conspicuous and colorful such as those of bougainvillea.

BudÑRudimentary or condensed shoot containing embryonic leaves and/or flowers.

CalicheÑSoil condition created when a deposit of calcium carbonate is located beneath the soil surface. Found throughout the Southwest.

ChlorosisÑNutrient deficiency in plants. Indicated by leaves that have a yellowish cast. Iron chlorosis is common in the Southwest U.S.

CIMISÑCalifornia Irrigation Management Information System. Computer-generated information from weather stations across the state record and disseminate data to help determine a plant's water need.

CompostÑMixture of decomposed vegetative matter, useful for amending soil, mulching and fertilizing.

Controller (irrigation system)ÑRegulates when and how much water is applied via an irrigation system. Also known as a timer.

CrownÑPlace on a plant where roots and stems

join. Important to position most plants with the crown just slightly above soil level when planting to prevent rot.

CultivarÑCultivated variety of a plant, rather than a variety that occurs naturally in the wild. Properly designated with single quotation marks around the name, or with the abbreviation *Òcv.*

CuttingsÑSometimes called "slips." Portions of stem or root that can be induced to form roots and develop into new plants.

DeadheadÑRemoving flower heads after they are past prime, which can encourage more flowers.

DeciduousÑLosing leaves or other plant parts during dormant season of year. Plant almost appears to die but regrows the next season.

DivisionÑPropagation by dividing a clump into several parts, often done while plant is dormant.

Dormant, DormancyÑPlant that is alive but is not actively growing.

Drainage (soil)ÑWater movement through the soil, in regard to plant roots. Sandy soils are fast-draining; clay soils drain slowly.

Drip IrrigationÑSystem where water is delivered (dripped) to plants at their root zones by emitters.

Drip LineÑImaginary area around a tree or shrub that marks its widest growth. So called because rain tends to drip from plant leaves to the ground at its drip line.

Drought TolerantÑInherent ability

of a plant to survive without water for long periods of time.

EmitterÑIrrigation equipment that allows water to be applied slowly to plant roots in controlled increments, such as 1-gallon, 2-gallon or 5-gallon. Also called drip emitter.

EspalierÑA tree, shrub or vine trained (pruned) to grow flat against a wall or trellis.

EstablishÑTime it requires a plant to adjust to its life in the ground after planting and produce good root and top growth. Most plants are considered *Òestablished* after living and growing through two summer seasons.

Evapotranspiration (ET)ÑEvaporation of moisture from a leaf's surface. The ET rate for a given plant is the amount of moisture it needs to sustain itself.

EvergreenÑPlant that has green leaves throughout the year.

FamilyÑA biological classification. All members of a plant family share certain characteristics that are not found in other families. See Genus.

Feeder RootsÑRoots that absorb moisture and nutrients for a plant, typically located at the perimeter of a plant beyond its drip line.

FloretÑSmall, individual flower in the flowerheads of such plants as broccoli or sunflower.

FlowerÑReproductive unit of an angiosperm. The basic flower forms are *single*, with one row of usually 3 to 6 petals; *semi-double*, with more pet-

als, usually in two rows; *double*, with many petals in several rows and few or no stamens; and *fully double*, usually rounded in shape, with densely packed petals and with stamens obscured.

FoliageÑA plant's leaves.

GenusÑMost important subdivision of a plant or animal family, designated by the first word in the botanical name. In *Salvia elegans*, (pineapple sage), *Salvia* is the genus, *elegans* is the species. Also see Species.

Growing SeasonÑDays between last frost and first frost. In the Coachella Valley it is approximately 330 days.

Habit (growth, flowering)ÑThe natural form or tendencies of a plant. For example, typical growth habits are compact, upright or spreading.

Harden OffÑTo gradually adjust (harden) plants to colder temperatures. Common when plants from a nursery greenhouse are brought home.

HardpanÑSee Caliche.

HardscapeÑPart of the landscape that cannot absorb water, such as sidewalks, patios, rooftops and driveways.

Hardy, Cold

HardyÑDescribes a plant's resistance to, or tolerance of, frost or freezing temperatures (as in "hardy to 20°F"). The word does not mean tough, pest resistant or disease resistant. See Tender.

HeadingÑalso called Topping. Removing limbs and branches at arbitrary height, which ruins the tree's form.

HerbaceousÑIn a general sense, plants having non-woody tissues.

HybridÑOffspring of genetically different parents, usually produced accidentally or artificially in cultivation. Rarely occurs in the wild. See Cultivar.

HydrozoningÑGrouping and placing plants in a landscape according to water requirement. Typical zones are high, moderate and low.

Leach, LeachingÑThe washing action of rainfall or irrigation water to move nutrients or salts from the upper layers of soil where plant roots are located.

LeaderÑIn a single-trunk shrub or tree, the central, upward-growing stem.

Loam (soil)ÑWell-structured, fertile soil that is moisture retentive and well drained.

MicroclimateÑA small climate that differs from a surrounding large climate zone. Can be as small as a cooler location beneath a canopy tree compared to a warm exposure against a south-facing wall.

MulchÑA layer of matter applied to the soil, often over a plant's root zone to conserve moisture, protect the roots from temperature extremes, reduce weed growth and enrich the soil.

Native PlantÑA plant that grows in the wild in a given region.

NaturalizeÑPlants that spread on their own to grow in an area. For example, wildflowers can reseed to naturalize in a given location.

Organic MatterÑMaterials

blended into soil to improve plant growth. Compost, peat moss and bark products are examples.

Overseed (lawn)ÑAs warm-season grasses such as Bermuda go dormant and turn brown in winter, cool-season grasses such as annual or perennial rye are seeded over the lawn.

PerennialÑPlant that lives for at least three seasons, normally flowering every year. Usually herbaceous (nonwoody).

PetioleÑThe stalk to which a leaf is attached.

pH, pH ScaleÑA measure of soil acidity or alkalinity. 0-6.9 is acid; 7 is neutral, 7.1-14 is alkaline.

RhizomeÑUnderground stem that lives for more than one season. Iris have rhizomes.

RunnerÑHorizontally spreading stem that forms roots at nodes. Often confused with stolon.

RunoffÑWhen rainfall or irrigation is too great for the soil to absorb and water is wasted as it runs off.

Self-Seed, Self-SowÑDropping or freely distributing its seed, from which new plants grow the following season.

Soil ProbeÑA device, usually a metal rod, that is pushed into moistened soil to gauge how deeply moisture has reached into the soil.

SpeciesÑPlants having certain differences from other plants within the same genus. See Genus.

StolonÑStem that grows horizontally along the ground, taking root at

intervals, often forming new plants where it roots.

SuckerÑPlant growth that appears different from other stems and branches on a grafted plant. Sucker growth should be removed, especially if below the graft union of roses and fruit trees.

Tender, Cold

TenderÑSusceptible to cold temperature damage, as contrasted to Hardy.

TopiaryÑTechnique of shaping shrubs and trees into formalized shapes, often in geometric or animal forms.

Transitional

GardenÑPlants with low to moderate water needs that blend with and make the transition between a high-water oasis garden and low-water plants on the landscape perimeter.

UmbelÑClusters of florets resembling an umbrella supported by small stems that seem to rise from the same point.

VariigatedÑMarked with patches or streaks of different colors.

VarietyÑNaturally occurring variation of a species. Abbreviated as var. or v.

WindbreakÑPlanting of trees and shrubs to block, filter or deflect the wind.

WindthrowÑPlant, usually a tree, uprooted by strong winds.

XeriscapeÑA method of landscaping that uses common-sense plant selection and maintenance principles to save water while enhancing our surroundings.

Resources

In addition to this book, many other valuable resources and reference materials are available, several are listed here. Videotapes and CD-ROMs add visual elements to the educational process. In fact, Coachella Valley Water District supplements this publication with a CD-ROM version, available directly from the Coachella Valley Water District.

This publication can also be viewed on-line at Coachella Valley Water District's internet site: www.cvwtd.org. Searches for desert landscaping and water conservation will lead you to new web sites for more information.

Books

California Native Trees and Shrubs, Lee W.

Lentz and John Dourley, Rancho Santa Ana Botanical Garden, Claremont, Calif.

Citrus, Lance Walheim, Ironwood Press, Tucson, Ariz.

Coping with Soil Salinity, Sam Aslan, U.S. Department of Agriculture Consolidated Farm Service Agency, Indio, Calif., field office

Desert Accent Plants; Desert Bird Gardening; Desert Butterfly Gardening; Desert Grasses; Desert Ground Covers & Vines; Desert Shrubs; Native Trees; and Desert Wildflowers are booklets available from Arizona Native Plant Society, Tucson, Ariz.

Desert Gardener's

Calendar, George Brookbank, University of Arizona Press, Tucson, Ariz.

Desert Landscape Architecture, John Krieg, CRC Press, Tampa, Fla.

Desert Landscaping, George Brookbank, University of Arizona Press, Tucson, Ariz.

Earth-Friendly Desert Gardening, Cathy Cromell, Arizona Master Gardener Press, University of Arizona Maricopa County Cooperative Extension, Phoenix, Ariz.

Gardening in the Desert, Mary Irish, University of Arizona Press, Tucson, Ariz.

Gardening in the Southwest, Sunset Publishing, Menlo Park, Calif.

How to Grow The Wildflowers, Eric A. Johnson and Scott Millard, Ironwood Press, Tucson, Ariz.

Landscape Plants for Dry Regions, Warren Jones and Charles Sacamano, Perseus Publishing, Cambridge, Mass.

Landscape Plants for Western Regions, Bob Perry, Land Design Publishing, San Dimas, Calif.

The Low-Water Flower Gardener, Eric A. Johnson and Scott Millard, Ironwood Press, Tucson, Ariz.

Low-Water Use Plants, Carol Schuler, Fisher Books, Tucson, Ariz.

Native Plants for Southwestern Landscapes, Judy Mielke, University of Texas Press, Austin, Texas

Native Texas Plants, Sally Wasowski and Andy Wasowski, Gulf

Publishing, Houston, Texas

Natural by Design, Judith Phillips, Museum of New Mexico Press, Santa Fe, New Mexico

Natural History of the Sonoran Desert, Steve Phillips, editor, Arizona-Sonora Desert Museum Press, Tucson, Ariz.

Plants for Dry Climates, Revised Edition, Mary Rose Duffield and Warren D. Jones, Perseus Publishing, Cambridge, Mass.

Plants for Natural Gardens, Judith Phillips, Museum of New Mexico Press, Santa Fe, New Mexico

Pruning, Planting & Care: Johnson's Guide to Gardening, Eric A. Johnson, Ironwood Press, Tucson, Ariz.

Saline and Alkali Soils, Agriculture Handbook 60, U.S. Department of Agriculture, Washington D.C.

Southwestern Landscaping with Native Plants, Judith Phillips, Museum of New Mexico Press, Santa Fe, New Mexico

Sunset Western Garden Book, Sunset Publishing, Menlo Park, Calif.

Taylor's Guide to Gardening in the Southwest, Houghton Mifflin Co., Boston, Mass.

Turfgrass Water Conservation, Victor A. Gibeault and Stephen T. Cockerham, University of California, Division of Agricultural and Natural Resources, Berkeley, Calif.

Waterwise Gardening, Sunset Publishing, Menlo Park, Calif.

Videos and CD ROMs

Desert Landscaping: Plants for a Water-Scarce Environment, CD-ROM, Water Resources Research Center, University of Arizona, Tucson, Ariz.

Drought Survival Guide: video, Sunset Publishing, Menlo Park, Calif.

Efficient Water Management in the Landscape: video, San Luis Video Publishing, San Luis Obispo, Calif.

Landscape Irrigation Maintenance and Troubleshooting: video, San Luis Video Publishing, San Luis Obispo, Calif.

Micro Irrigation Management: video, Richard J. Soltys Productions, Coachella Valley Resource Conservation District, Indio, Calif.

Micro Irrigation Uniformity and Efficiency: video, Richard J. Soltys Productions, Coachella Valley Resource Conservation District, Indio, Calif.

Public Gardens

Arboretums and botanic gardens offer valuable information and ideas on plant selection, landscaping and water conservation. Note that the information regarding these gardens is subject to change. Phone ahead for up-to-date information.

COACHELLA VALLEY GARDENS

Coachella Valley Water District
Avenue 52 at Hwy 111
Coachella, Calif. 92236
(760) 398-2651

Demonstration gardens are available for public viewing at headquarters (address above) and 75-525 Hovley Lane East in Palm Desert, CA 92211.

Desert Water Agency
1200 S. Gene Autry Trail
Palm Springs, Calif.
92264
(760) 323-4971

Serving Palm Springs proper, DWA houses water-efficient demonstration gardens at its headquarters and nearby water-recycling facility.

College of the Desert Arboretum
43-500 Monterey Avenue
Palm Desert, Calif. 92260
(760) 773-2561

The landscaping on this 160-acre campus is being redesigned over the next decade to suggest appropriate plants for the public and landscape industry. Desert Rancher's Park is separately maintained as a test garden for new plant introductions. Student employees assist with propagation and culture of nursery stock.

The Living Desert
47-900 Portola Avenue
Palm Desert, Calif. 92260
(760) 346-5694

Coachella Valley gardeners have easy access to The Living Desert where new horticultural and landscape plant displays are created regularly to offer a variety of ideas for home use. Local Sonoran Desert plants can be viewed with species from Australia, Africa, South America and Asia. Educational programs and tours supplement the exhibits. Located 1-1/2 miles south of Highway 111. Open 9 a.m. to 5 p.m. daily Sept. 1 to June 15. Entrance fee.
www.livingdesert.org.

ARIZONA GARDENS

Arizona-Sonora Desert Museum
2021 North Kinney Road
Tucson, Ariz. 85743
(520) 883-2702 for recorded information
(520) 883-1380

Located 14 miles west of downtown Tucson. Head west from I-10 on Speedway through Gates Pass, then north on Kinney Road to the Museum entrance.

Over 31 developed acres on a total of 186 acres, including natural habitat zoo, walk-in aviary, demonstration gardens, earth science exhibits and more. Over 1,000 plant species and 300 live animal species.

Open daily 8:30 a.m. to 5 p.m. from mid-September to mid-March. Open 7:30 a.m. to 5 p.m. from mid-March to mid-September. No tickets sold one hour before closing. Entrance fee; children

under 6 free with adult.

Desert Botanical Garden
1201 North Galvin Parkway
Phoenix, Ariz. 85008
(480) 941-1225

Located 8 miles east of the center of metropolitan Phoenix. Cross streets to the south are Van Buren and Galvin Parkway. Cross streets to the north are 64th Street and McDowell Road.

145 acres of landscaped grounds include diverse collections of succulent plants. More than 50,000 plants on display. Gift shop and restaurant on site.

Open daily 8 a.m. to 8 p.m. Closed July 4th, Thanksgiving, and Christmas Day. Entrance fee. www.dbg.org.

Boyce Thompson Southwestern Arboretum
37615 Highway 60
Superior, Ariz. 85273
(520) 689-2811 for recorded information
(520) 689-2723

Located 60 miles east of Phoenix on Highway 60, 3 miles west of Superior.

Over 35 acres and two miles of nature trails that represent plants and gardens in the Sonoran Desert of Arizona.

Open daily 8 to 5 p.m. Closed Christmas Day. Entrance fee.

Tohono Chul Park
7366 North Paseo del Norte
Tucson, Ariz. 85704

(520) 575-8468 for recorded information
(520) 742-6455
From I-10, take Ina Road exit east to North Paseo del Norte. Go north (left) a short distance and turn east (right) to the garden

entrance.

Over 500 plant species on 49 acres of demonstration gardens and nature trails, including several patios, ramadas and special gardens. Features three museum shops.

Park open daily all year 8 a.m. to sunset. (Gates close at 5 p.m.) Entrance fee.
www.tohonochulpark.org.

Tucson Botanical Gardens
2150 North Alvernon Way
Tucson, Ariz. 85712
(520) 326-9686

Located in central Tucson, on North Alvernon Way just south of Grant Road. Take I-10 exit east on Grant, travel to Alvernon, then head south a short distance to garden entrance.

More than 5 acres of gardens and displays, with over 4,000 plant species. Many specialty gardens, including Xeriscape.

Open daily 8:30 a.m. to 4:30 p.m. Closed July 4, Thanksgiving, Christmas Day, New Year's Day.

Entrance fee required. Children 5 and under free.

University of Arizona Campus Arboretum
Herring Hall, University of Arizona
Tucson, Ariz. 85721

The University of Arizona Campus Arboretum is the oldest continually maintain public garden space in Arizona. As a result, over 400 tree species, as well as impressive cacti and succulents from desert lands around the world are on display. Right in the center of Tucson. Campus is

open every day to all. During the week, visitors can get brochures and information in Herring Hall, located south of Old Main. On-line tours and plant identification information is available at www.arboretum.arizona.edu.

CALIFORNIA GARDENS

Landscapes Southern California Style Western Municipal Water District 450 East Alessandro Blvd. Riverside, Calif. 92508 (951) 789-5087

A 1-acre, water-wise demonstration garden designed for self-guided tours. Shows how to save water, time and money in the landscape.

Open daily (except holidays) 10 a.m. to 4 p.m. No entrance fee.

Los Angeles State & County Arboretum 301 North Baldwin Ave. Arcadia, Calif. 91007

Located 20 miles east of downtown Los Angeles. From the 210 Freeway, take the Baldwin Avenue exit south about 1 mile to entrance.

Over 127 acres of landscaped grounds demonstration gardens, plant collections and historic buildings.

Open daily 9 a.m. to 4:30 p.m. Closed Christmas Day. Entrance fee required.

Rancho Santa Ana Botanic Garden 1500 North College Ave. Claremont, Calif. 91711 (714) 625-8767

Located 30 miles east of Los Angeles. From I-10 take Indian Hill Boulevard exit north to Foothill

Boulevard. Travel east to College Avenue. Go north on North College Avenue to the garden entrance.

86 acres of native California plants, including more than 2,800 species.

Open daily 8 a.m. to 5 p.m. Closed July 4th, Thanksgiving, Christmas and New Year's Day. No entrance fee.

Santa Barbara Botanic Garden 1212 Mission Canyon Rd. Santa Barbara, Calif. 93105

(805) 563-2521 for recorded information.
(805) 682-4726

Over 78 acres of display gardens and preserve of California native plants, grouped by geographical region. Although Santa Barbara is a coastal region, the limited availability of water makes it a fine resource to learn about water conservation. Open 9 a.m. to 6 p.m. March-Oct; 9 a.m. to 5 p.m. Nov.-Feb. Entrance fee required.

Theodore Payne Foundation for Wild Flowers and Native Plants 10459 Tuxford Street, Sun Valley, Calif. 91352 (818) 768-1802 (818) 768-3533

Wildflower Hotline March to May. Northwest of Glendale off I-5. Take the Sunland Boulevard exit north to Tuxford Street. Turn right on Tuxford to entrance, which is marked with a small sign.

The Theodore Payne Foundation is a learning and information center and nursery for 800 plant species, including rare

and endangered plants.

Open 8:30 a.m. to 4:30 p.m. Tuesday to Saturday. Summer hours vary: Call ahead. No entrance fee. www.theodorepayne.org

UCR Botanic Gardens University of California, Riverside Campus Riverside, Calif. 92521 (951) 784-6962

From I-215/State Highway 60, exit Martin Luther King Blvd. and head west. Turn north on Canyon Crest Ave. to enter the University. At Campus Drive turn east and follow the signs to the gardens.

Open daily 8 to 5 p.m. Closed July 4th, Thanksgiving, Christmas and New Year's Day. No entrance fee but small donation requested. www.gardens.ucr.edu

NEVADA GARDENS

Desert Demonstration Garden 3701 Alta Drive Las Vegas, Nev. 89153 (702) 258-3205

From I-15 take the West Charleston Boulevard off ramp. Proceed west on Charleston then right on Valley View, and right again on Alta Drive to entrance.

A garden dedicated to water conservation. Founded by the Las Vegas Kiwanis Club, rededicated by Las Vegas Water District and University of Nevada Cooperative Extension Service.

Open Monday to Friday 8 to 6 p.m. Open Saturdays 8 to 12 p.m. Closed New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Nevada Day

(October 31st), Veteran's Day, Thanksgiving (Thursday and Friday), and Christmas Day. No entrance fee.

Ethel M[™] Chocolates Botanical Cactus Garden 2 Cactus Garden Drive Henderson, Nev. 89014 (702) 458-8864

Located 5 miles from I-15 and Las Vegas Boulevard. Take Tropicana Boulevard east to Mountain Vista, go south to Sunset Way (adjacent to the Ethel M Chocolate Factory on Cactus Garden Drive in the Green Valley Business Park). Follow signs to garden entrance.

A beautiful, 3-acre display of colorful desert shrubs, trees and exotic cacti and succulents. Open daily 8:30 a.m. to 7:00 p.m. No entrance fee.

University of Nevada Las Vegas Arboretum 4505 Maryland Parkway Las Vegas, Nev. 89154 (702) 739-3392

Travel two miles east of I-15 and Las Vegas Boulevard on Tropicana Avenue to Swenson Avenue, turn north to Harmon Avenue, then turn east. Entrance to garden is off Harmon Avenue. Parking areas located north of Barrick Museum of Natural History at the end of Harmon.

A unique, on-campus arboretum and Xeriscape demonstration garden.

Museum hours are Monday to Friday 9 a.m. to 4:45 p.m.; Saturday 10 a.m. to 4:45 p.m.

Open daily—does not close. No entrance fee.

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Desert Gardens can be Lush and Efficient

The image of a desert garden consisting only of cacti, boulders and gravel is a common one, but this perception is no longer accurate. Many new native and adapted plants are now available that are lush in appearance yet are efficient users of water. They are proven to provide as much or more interest over long periods than their water-thirsty counterparts.

This book tells how to select and grow more than 300 plants—trees, shrubs, ground covers, vines, cacti, ornamental grasses and flowering annuals and perennials—adapted to California’s Coachella Valley. It also explains how to design a water-efficient landscape for any size lot. An extensive chapter tells how to install an irrigation system that is right for your home, and shows how to water plants easily and efficiently. The result becomes a landscape that you’ll enjoy, while conserving the desert’s most precious resource—*water*.



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