Metropolitan Water District
of Southern California
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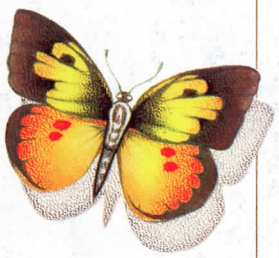
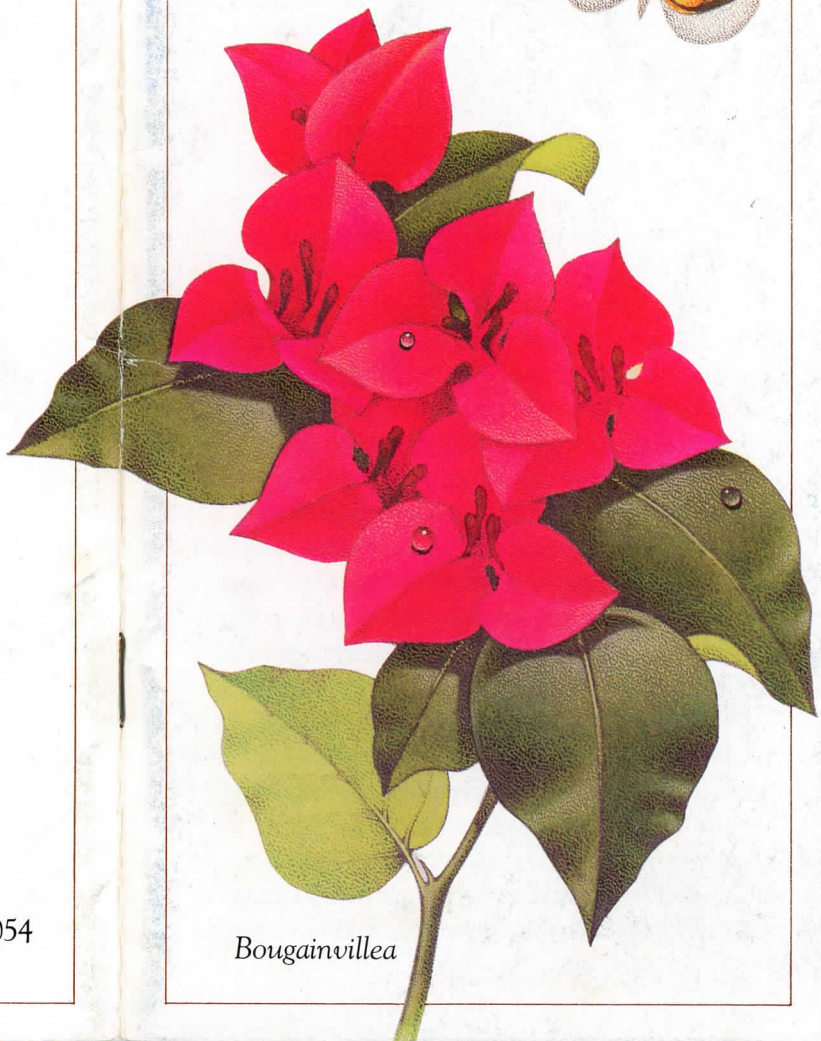
How To Have A Green Garden In A Dry State.





Bougainvillea

Water Doesn't Grow On Trees.

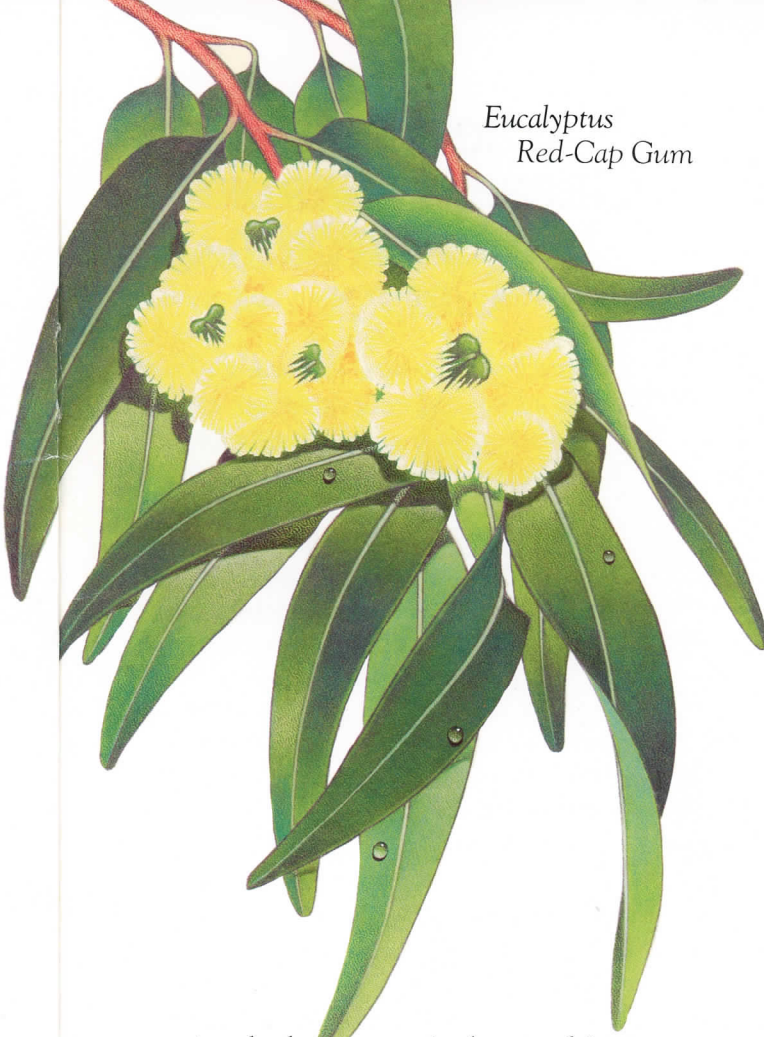
The winter of 1977-78 brought desperately needed rain to California in record amounts. It filled rivers and lakes and reservoirs. It deposited tons of welcome snow in the mountains. And once the danger of floods and landslides had passed, it lulled us into a false sense of security. The drought was over. We turned on the faucets and fountains and sprinklers. We watered our lawns, gardens and, sometimes, sidewalks. And we forgot rather quickly just how dry California can be.

California's weather patterns are anything but predictable. Perhaps heavy winter rains will come again. Perhaps not. But the experts tell us that even normal rainfall may be incapable of filling our needs in years to come. Our demand for water continues to rise. But the state's history of lower than average rainfall and drought virtually guarantees a limited supply for future generations.

What can we do?

Conserve. During wet years as well as dry. And a good place to start is in the garden. Nearly half the water used in a typical home is used outdoors, soaking lawns, trees, shrubs, flowers, backyard vegetable gardens. And perverse as it may seem, our gardens don't really appreciate all that water. Eight out of ten plant problems are caused directly or indirectly by too much water. So breaking the overwatering habit will save both plants and water. But not quite enough.

The obvious solution is to use plants that require less water—much less. That doesn't mean turning your backyard into a miniature Death Valley. Many drought-resistant plants are green, lush and almost shameless in their production of blooms. They come in every shape, color and size—from clinging ground cover to towering shade trees. And most of them can go as long without water as a camel. Which means less work in the garden once it's become a water saver.

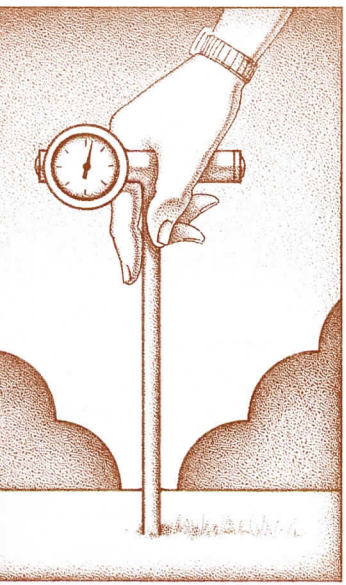


Eucalyptus
Red-Cap Gum

Creating a water-saving garden takes a little knowledge and some careful planning. It doesn't require plowing under everything presently living in your yard. It can be a gradual process—replacing tired old plants with young drought-resistant ones. Whether you do it gradually or start from scratch, you'll need to know the best plants to use, where and when they should be planted, and the most economical ways to water both thirsty and unthirsty gardens. You'll find all that information in the following pages. Because that's what this little book is all about—keeping California green, but only a little bit wet.

How To Keep Your Present Garden (And California) Green.

You can start by giving your plants some credit for hardiness. Most of them can survive a drought—if you train them well, and early. Start weaning them from water dependence in the spring. Let them dry out. Then treat them to infrequent, deep watering. You'll cut down on water loss through evaporation and encourage the kind of deep root growth that can sustain plants through dry periods. Many landscape architects subject new plantings to some drought stress, although baby plants, even the unthirsty kind, need more water than older ones. But whether they're babies or grownups, all your plants probably need much less water than you've been giving them.



Stop watering by the calendar. Just because you've always watered on Tuesdays and Thursdays doesn't mean water is needed on Tuesdays and Thursdays. Take a shovel into the garden and turn one blade of soil. If the soil is dry, water it. If it isn't, go play tennis.

Should you be mechanically or scientifically minded, or you simply like gadgets, there are several kinds of equipment designed to test moisture content of the soil. A TENSIOMETER tells you how damp or dry the ground is by registering soil moisture tension. The tensiometer measures the water in a plant's root zone so you can't be fooled by surface moisture, which is often quite different from the moisture content several inches down. MOISTURE SENSORS are fairly simple devices that measure the electric conductivity of the soil with a slender metal probe. And a SOIL SAMPLER is just a tube that pulls out a core of soil when pushed into the ground. With it, you can learn how deeply water penetrates the particular type of soil in your garden. Ask your nurseryman for these and other types of moisture measures.

African Daisy

Learn to recognize a plant's way of telling you it's thirsty. Its leaves may lose their gloss, curl up or cup, and start to droop just before it wilts. A greyish color on foliage is also a sign of thirst. And a little bit of research will tell you which plants in your present garden are real guzzlers and which ones can go longer than usual without water.

Different soils have different watering needs. Sandy soil loses water most quickly because of evaporation and quick downward percolation. Clay resists the downward movement of water and encourages runoff. One expert suggests watering clay soil for just a few minutes at a time, with one-hour intervals between waterings to allow water to seep into the ground. But the best type of soil for water-conscious gardeners is a loam with a good sand/clay mixture. In fact, deep-rooted plants in loam may require watering as infrequently as once a month. And shallow-rooted ones can go for four to six days between waterings. But just how long your particular garden can go without water is something only you can determine. All it takes is a little knowl-

edge. And the savings in water will make a big difference in your future ability to keep your garden green.

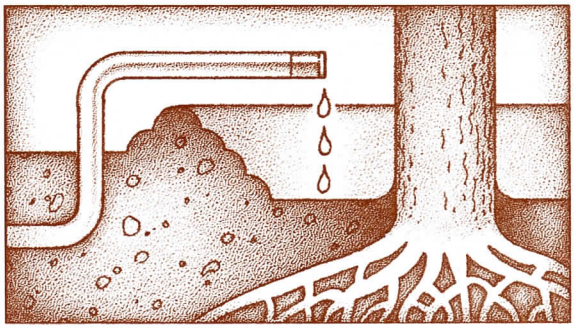
Please Don't Water The Sidewalk.

How you water is as important as knowing when to water. There are a large number of irrigation methods available. Some require a substantial initial investment. Some are inexpensive little gadgets that can be adapted to your present watering equipment. And others are simply ideas that require a little ingenuity and some physical labor to put into effect. We'll discuss some of these ideas. But, whichever you choose depends more on time and budget than on the type of garden you have.

DRIP IRRIGATION. Possibly the most efficient method of watering consists of a system of narrow, porous tubes that slowly feeds water exactly where you want it to go. Placed on or under the ground, the system can be left in place all year and provides probably the least runoff of all available systems. A drip irrigation system can cut water use by 20 to 50 percent.

SOIL SOAKERS. A cheaper, and not quite as efficient, substitute for drip irrigation, soil soakers are long tubes of plastic or canvas perforated with rows of tiny holes. Like drip irrigation tubes, they can be placed wherever you want to water, over the root systems of trees and shrubs, along rows of plants. With the holes facing down, the tube can be connected to a simple garden hose and left in place indefinitely.

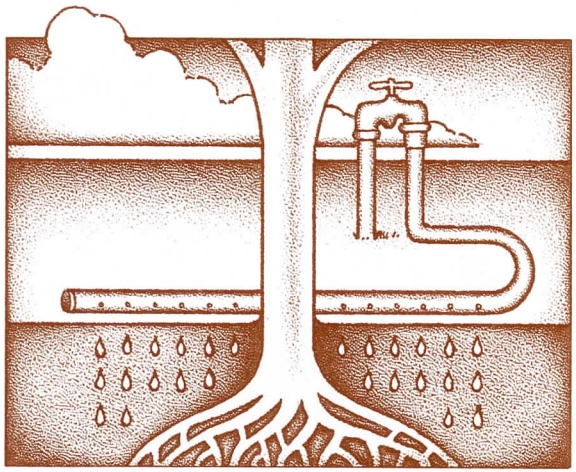
SPRINKLER SYSTEM. A low output, automatic sprinkler system may be the easiest way to water and, if regulated properly, one of the most efficient. The timer should be adjusted to conform to the weather and your yard's particular watering needs, as well as to avoid overwatering. Low output sprinklers are suggested because they feed water more slowly, allowing greater absorption and less runoff. One of the biggest drawbacks of automatic sprinklers is their



Gazania

tendency to water driveways and sidewalks, as well as greenery. If your sprinkler heads are guilty, either readjust them or replace them with heads that cover less area. If you're just installing your system and you have yard sections with different water requirements, install separate valves.

HOMEMADE WONDERS. A drip irrigation system needn't cost a penny if you have time and ingenuity. Place a perforated coffee can or plastic jug in the ground over the root system of a tree or shrub and fill it with water. The water will slowly drip through the holes into the ground. No runoff, no evaporation, no expense.



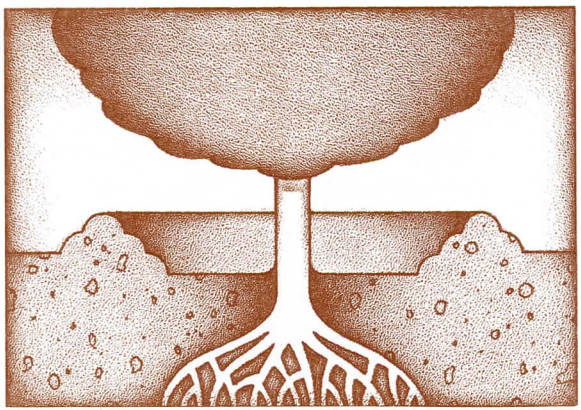
DEEP-ROOT IRRIGATORS. When trees and shrubs sit on a slope, a deep-root irrigator is the best method for avoiding extreme runoff. This device is a giant hypodermic needle attached to the end of a hose and inserted into the ground over the root system. When its valve is opened, it emits water 12 to 18 inches deep. It can also be used to fertilize roots. And, needless to say, there is absolutely no runoff or evaporation.

HAND WATERING. The experts strongly differ on the efficiency of hand watering. Some feel that, done correctly, there is no more efficient method of watering. The fact remains, however, that most of us don't have time to wrestle an unwieldy hose around the yard. Using a hose, it takes about half an hour to properly water a deep-rooted tree. And a 3/4 inch hose with no restrictive nozzle can discharge about 10 to 12 gallons a minute, more than the soil can absorb in that time. Additionally, the water is probably being distributed unevenly.

If you have no choice other than using a hose for watering lawns and flower beds, buy an inexpensive, spring-loaded hose nozzle which releases water only when you want it. The fingertip pressure control and spray adjuster are much more efficient than a thumb on the end of a hose.

Catch It If You Can.

No matter how carefully you water, you still have to deal with runoff. But there are simple ways of catching excess water before it winds up in the street. Individual earth or decorative basins around trees and shrubs will hold water until it seeps into the ground. Shallow irrigation ditches next to rows of plants will serve the same purpose. Rain water can also be captured this way. Digging ditches toward plants that live under roof eaves allows rain water to run toward those plants. And a deep, moisture reserve helps put off watering for weeks after a rainfall.



The Summer Starvation Program.

Obviously, we all want big, lush healthy plants. And a good, high- nitrogen fertilizer aids that growth process tremendously. But summer is just not the best time to apply one. Growing plants need water. And a newly fertilized plant drinks all the water it can get, including that intended for its unfertilized neighbors. So the better time to fertilize is during the cooler, wetter days of fall, winter or spring. And when fall, winter or spring are a little dryer than we'd like, the experts recommend using a low-nitrogen fertilizer. Your plants, trees and shrubs will still grow and prosper, but not as riotously, nor as gluttonously as in wetter years.

If shrubs and ground covers still seem to be getting away from you, a chemical growth retardant will slow them down and make them a little less demanding in their water needs. And you'll save trimming time.

Weeds. More Than Just An Ugly Face.

Nobody likes weeds. They're ugly. And like every other growing thing, they're thirsty. So pull 'em out as fast as they pop up. You might also try a pre-emergent herbicide on weeds. A dose will kill the seeds as they sprout and save hours of labor.

And while you're manicuring, consider some of these other ways to save water and keep a tidier yard. Pruning back and thinning out heavily foliaged trees and shrubs will do two things. It will turn an overgrown, shapeless blob into a handsome, sculptured specimen.

And you'll have a true water saver because fewer leaves means less water loss through transpiration. But don't overdo it or you'll wind up with sunburned bark and unshaded soil

Oleander

that can dry out too fast. Remove sickly plants and give the healthy ones room to grow strong roots. When planting—in the cool seasons, of course—space plants farther apart than you usually do. Fewer plants mean stronger plants and, naturally, less water.

Cover Up And Save.

A layer of mulch in the garden can contribute significantly to water conservation. It reduces evaporation, moderates soil temperatures, discourages weed growth and helps prevent soil compaction. And if that isn't enough, mulching can be a very attractive alternative to thirsty plants and ground covers. The best-looking mulches are bark, wood chips and pebbles. Grass clippings and sawdust work well, too, but be wary, for these two use the nitrogen young growing plants need. So best use them only on established areas. The leaves that plants and trees drop add nutrients to the soil as well as serving as a mulch. Plastic and newspapers can also be used but, needless to say, they are not very pretty.

Ice Plant

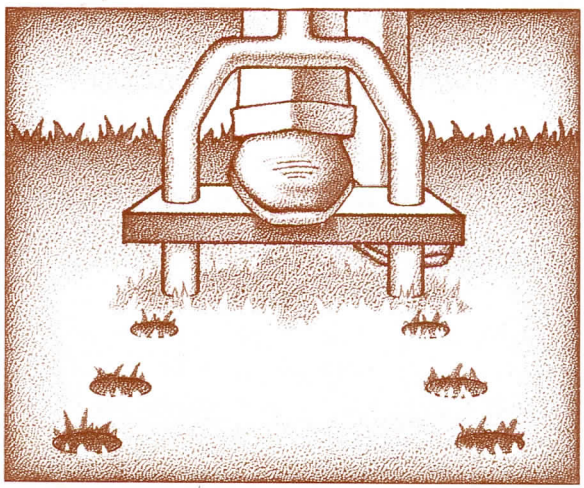
A Healthy Yard Drinks Less.

Conditioning the soil can add to its abilities to retain water and nourish plants. The best time to do this, however, is not during the dry season when any disturbance of the soil increases water evaporation. A good compost pile is a gardener's best friend. Incorporated into the soil, well-rotted compost provides a good basis for healthy new, and existing, plantings. Aerating soil during the winter months will aid in water absorption and retention. And the holes provide excellent avenues for fertilizing plants and their roots. But don't aerate after March. You'll just be aiding evaporation.

The ideas covered so far will help conserve great quantities of water. But, as people in some parts of the state already know, that won't be enough during a summer of intense heat and restricted water use. Our present, water-dependent gardens simply won't make it through that kind of summer. But the spectre of California without its gardens needn't loom on the horizon. As we've already said, there are alternatives—great, lush, blooming alternatives—that can survive whatever droughts nature has in store.

The Drought Resisters.

The following lists of trees, shrubs, vines, flowering plants, and ground covers are composed of western natives and imports from areas with climates similar to ours. Many are



available at local nurseries. Those not now available will be—if we demand them. Nurserymen won't stock what nobody wants. But most are happy to order the drought resisters for you. So if you don't see them, ask. And your nurseryman should also be able to add to these lists.

And, while most of the plants listed will thrive wherever you put them in Southern California, a few will do better at the beach than in inland valleys. And vice versa. Escallonia is happier closer to the water, as are Sea Lavendar and Elephant's Food. Oleander and Bird of Paradise, on the other hand, prefer to live a bit inland.

Only two of the trees listed are at all picky about their places of residence. The Palo Verde, a native of the deserts of the southwest, thrives best in desert conditions. And the Catalina Ironwood likes to remain as close as possible to its native Channel Islands. Your nurseryman will be able to give you more specific information on what to plant where.

A note of caution to gardeners who live in the foothill areas. A number of the plants and trees listed are simply too flammable for your yards and gardens. In the following lists we've noted with an asterisk those that are even moderately flammable.

TREES

Fern Leaf Acacia*
Deodar Cedar*
Western Rosebud
Arizona Cypress*
Eucalyptus* (many varieties)
European Olive
Toyon
Palms (many varieties)
Italian Stone Pine*
Aleppo Pine*
Canary Island Pine*
California Pepper
California Live Oak
Valley Oak
Cork Oak
Salt Cedar
Silk Oak
Carob
Catalina Ironwood
African Sumac
Giant Sequoia*
Palo Verde
Flaxleaf Paperbark
Loquat
California Black Walnut
Rhus Lancia
Geijera Parvifolia
Locust

SHRUBS

Strawberry Tree
Ceanothus
(California Lilac, many varieties)
Hopseed Bush
Junipers*
(many varieties)
Oregon Grape
Shiny Xylosma
Sugar Bush*
Yucca
Yarrow
Agave
Wormwood
Saltbush
Contauroa Gymnocarpa
Elaeagnus
Pittosporum*
Elephant's Food
Dusty Miller

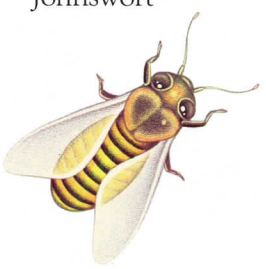
*Not Recommended In High Fire Danger Areas.

VINES

Bougainvillea*
Wisteria*
Cup-of-Gold Vine
Potato Vine
Cape Honeysuckle
Vitis Vinifera
(Wine Grape Vine)*
Trumpet Creeper

GROUND COVERS

Dwarf Coyote Brush
Junipers*
(many varieties)
Rosemary*
Ice Plant
(many varieties)
Gazania
African Daisy
Creeping St. Johnswort



FLOWERING PLANTS

Red Valerian
Bush Morning Glory
Pampas Grass
Coreopsis Verticillata
Smoke Tree
Broom
Escallonia
Buckwheat
Garrya Eliptica
Red-Hot Poker
Lavender*
Sea Lavender
Mickey Mouse Plant
Fountain Grass
Cape Plumbago*
Bird of Paradise
Matilija Poppy
Winter Savory
Bush Germander
Oleander
Lemon Bottlebrush
Rockrose
Pride of Madeira
Aloe
Feathery Cassia
Lantana*
Fremontia

The Water-Saving Gardens.

Designing your own water-saving garden is a matter of knowledge and your own taste. Our illustrations are just a few of the many ways you can incorporate unthirsty plants into your yard. But there are a few things you should know before beginning.

Morning Glory Bush

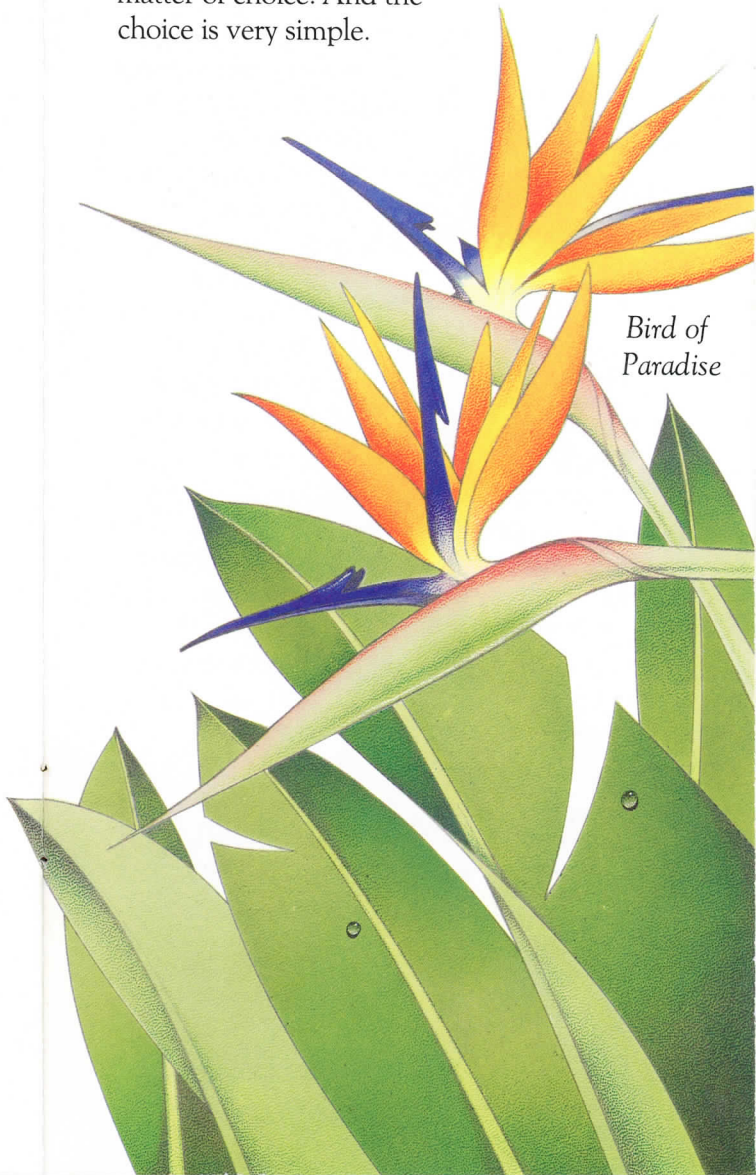
Drought resisters should not be mixed in with thirstier plants. In many cases, they can go all summer long without water. And treating them to even small amounts of water is as bad for them as is letting the thirsty ones go dry. Set aside a portion of your yard or garden strictly for the drought resisters and separate the ones that need a little bit of water from the ones that can survive on none at all.

As with any planting, don't do it during the summer months. As we've pointed out, even drought resisters need some water to get started. And if cost isn't a factor, buy larger plants. Their survival chances are a bit better than those of infants. Then talk to your nurseryman and let your imagination and a little physical labor do the rest.

The Flowers That Bloom In A Drought.

People need plants. Nature has designed a rather simple system of cooperation between people and plants, as anyone who has taken a high school biology course knows. Plants take in carbon dioxide and give off oxygen. The more plants we have around, the more oxygen we have in the air and the cleaner the air is. In Southern California, where air pollution is an accepted fact of everyday living, our plant life, therefore, serves as much more than decoration. We need green, growing things, whether we have an abundant water supply or not.

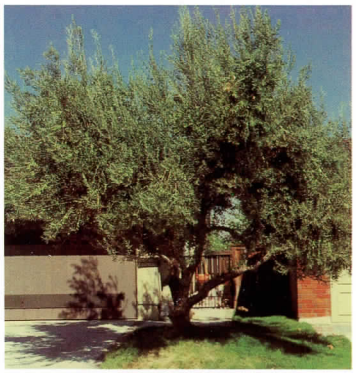
But the time has come to think logically about our gardens. Azaleas are beautiful. But they are thirsty. Ceanothus is also beautiful. And not very thirsty at all. So it's simply a matter of choice. And the choice is very simple.



Bird of Paradise

GROUP 1

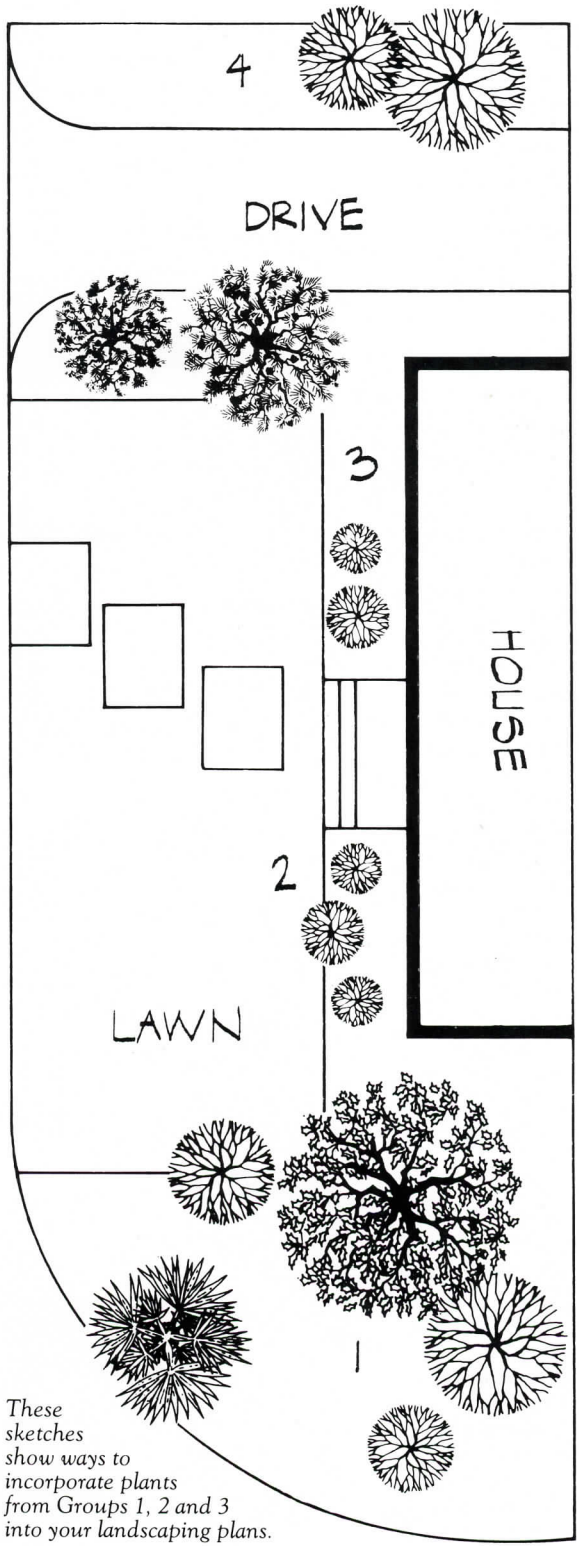
1 OLIVE TREE. The picturesque Olive grows to a height of 25 or 30 feet. Easily maintained, the Olive has been known to thrive into old age with no care at all.



2 JUNIPER. Great groundcover until it reaches a height of two inches, the Juniper can grow into a shrub or small tree. All types have needlelike foliage and fleshy, berrylike cones. They require very little water, but don't neglect them.

3 BOUGAINVILLEA. Shades of the old South. This lovely, flowering plant becomes very unthirsty as it gets older. As a groundcover, a vine or a big, lumpy shrub, its showy blooms add great splashes of color to the garden.

4 ICE PLANT. A colorful groundcover, Ice Plant grows to about six inches and produces blooms that range from pale yellow to brilliant pink. It tolerates drought conditions very well.



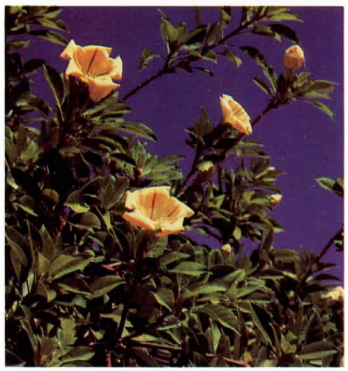
These sketches show ways to incorporate plants from Groups 1, 2 and 3 into your landscaping plans.

GROUP 2

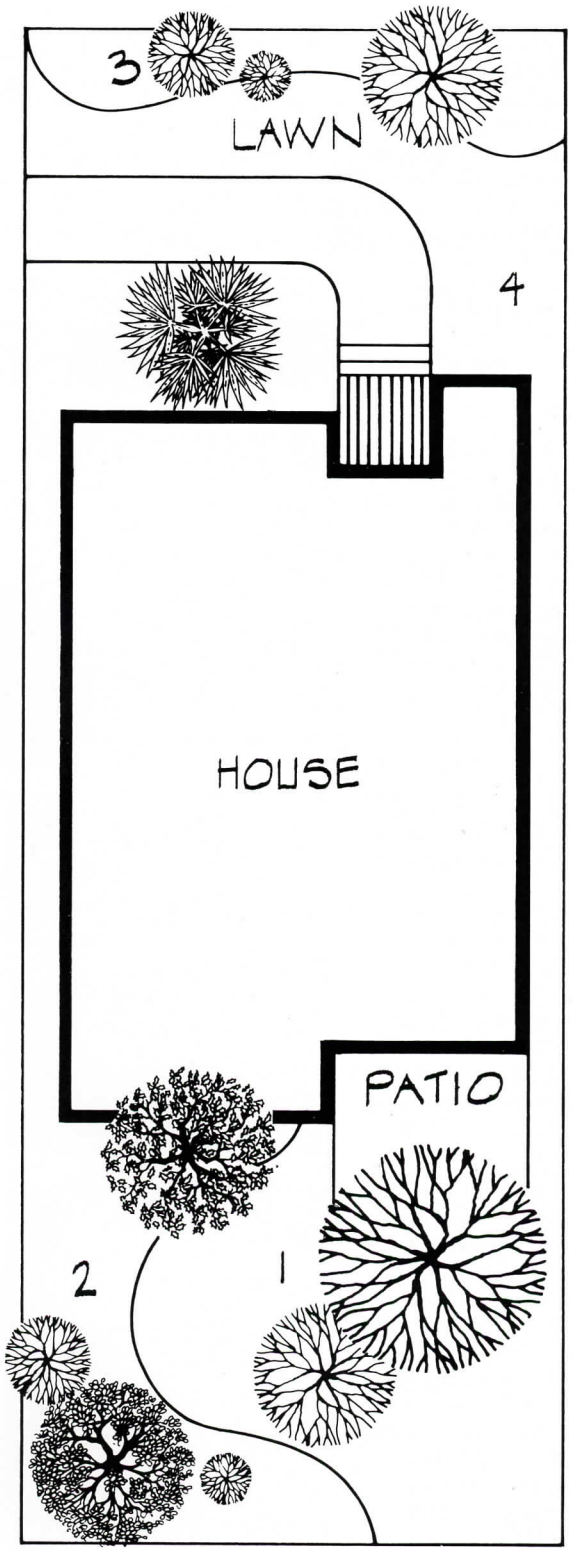
1 ACACIA. Profuse sprays of bright yellow or gold flowers identify the Acacia, which varies in size from a large shrub to a small tree. It has a talent for making it through the driest summers and makes an excellent windscreen.

2 CALIF. LILAC. In its 2-inch high mat form, the Ceanothus makes a terrific slope cover. It can also grow to a height of 14 feet. Its dark green, evergreen foliage is the perfect backdrop for spring flowers in many colors.

3 CUP-OF-GOLD VINE. This native of Mexico becomes highly drought-tolerant when its stems become woody. One vine can run 40 feet, a spectacular backdrop for the trumpet-like, large yellow flowers that bloom in spring.



4 LANTANA. The shamelessly blooming Lantana grows to six feet and can spread for miles. Its profuse, 2-inch flower clusters bloom during most of the warm months in a large variety of colors. And it's a hardy drought resister.



GROUP 3

1 MEXICAN FAN PALM. The majestic, Mexican Fan Palm can grow to a height of 100 feet. The visual contrast with smaller, flowering trees is very dramatic, as is its ability to thrive on almost no water at all.

2 YUCCA. Recognized by its clusters of swordlike leaves, the Yucca grows to a height of 20 feet or more and produces showy whitish flower spikes. It can go through the summer with no water.

3 ALOE. This tall, elegant succulent can reach a height of 18 feet and produces clusters of orange colored blooms. It doesn't do as well during drought conditions as some of its neighbors, but will perk up with a little water.

4 GAZANIA. Although this colorful groundcover can survive the summer well in coastal areas, it does need a bit of water when planted inland. Its colorful blooms appear in spring and early summer.