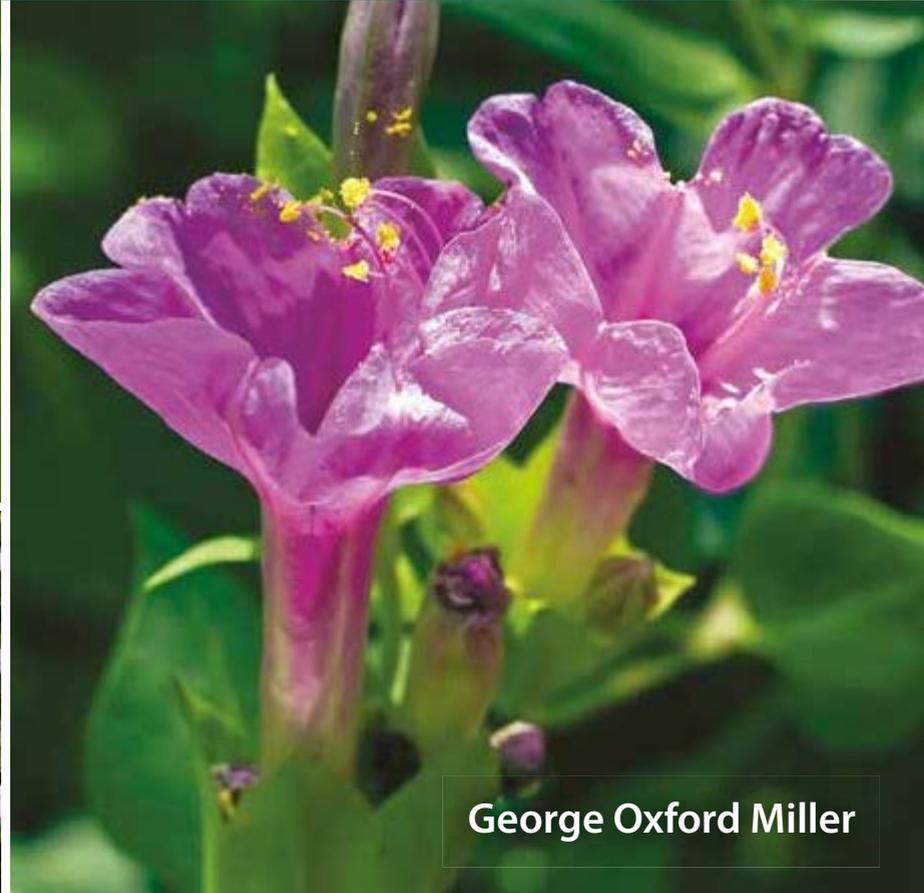


Southwest



Native Plant GARDENING FOR BIRDS, BEES & BUTTERFLIES



George Oxford Miller



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BIRDS, BEES & BUTTERFLIES

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George Oxford Miller

Adventure Publications
Cambridge, Minnesota

DEDICATION

My unbounded thanks goes to my wife, Carole Price, for her patience and endurance while we wandered the wilds of the Southwest, even when she had to bring a novel to read while I searched for the perfect photos.

ACKNOWLEDGMENTS

This book is but one additional step built on the decades-long efforts of numerous individuals and organizations who champion landscaping with native plants to remediate the environmental damage caused by human development.

O Friend!

In the garden of thy heart plant naught but the rose of love.

Bahá'u'lláh, founder of the Baha'i Faith

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10 9 8 7 6 5 4 3 2 1

Native Plant Gardening for Birds, Bees & Butterflies: Southwest

Copyright © 2021 by George Oxford Miller

Published by Adventure Publications

An imprint of AdventureKEEN

310 Garfield Street South

Cambridge, Minnesota 55008

(800) 678-7006

www.adventurepublications.net

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Printed in the United States of America

ISBN 978-1-64755-039-4 (pbk.); ISBN 978-1-64755-040-0 (ebook)

Introduction

In 1991 when I published my first book on landscaping with native plants of the Southwest, the emphasis was on replacing thirsty exotic ornamentals with water-wise native plants adapted to survive local climate extremes. In the intervening decades, native plant advocates emphasized reducing maintenance costs and creating a sense of place that embraces each region's unique biological heritage. Lady Bird Johnson, founder of the National Wildflower Center, famously said, "Florida should look like Florida and Texas look like Texas."

The beginning of the 21st century has witnessed an alarming increase of environmental destruction by urban sprawl, industrial expansion, global scale pollution, and planet-wide climate change. Pollinators—insects that pollinate flowers—have been hit particularly hard, with some regions losing up to 80% of insect numbers and diversity. Today, a major emphasis in native plant landscaping is to mitigate the habitat lost by our human activities. A pollinator garden will help repair our local environment one yard at a time.

Why Plant a Pollinator Garden?

The complex relationships in nature can fill us with a deep sense of mystery and even magic. You can look into the starry night sky and feel either insignificant in the scope of the universe or thrilled to be a part of the vast majestic cosmos. You can get the same feeling in your backyard when you see a butterfly or bee dancing from flower to flower sipping nectar and gathering pollen.

From our backyards to the tropical rainforests, the complex web that sustains life on the planet depends on native pollinators. Globally, insects pollinate nearly 80% of all flowering plants. Closer to home, pollinators fertilize 75% of all human food crops, specifically the fruits, vegetables, and nuts we eat. In our backyard gardens, tomatoes, squash, peppers, fruit trees, and flowers all depend on pollinators.

Yet across the planet the population of all insects is plummeting radically year by year. One overriding reason is that human activities have significantly altered 75% of the planet's landmass. Forty percent of the natural area in the continental United States has been altered, including 59% in the Midwest and 47% in the South. With the Southwest's burgeoning population, pristine plant and animal communities that have evolved together since the last ice age are being replaced by sprawling cities, suburbs, industrial farms, and energy development.

A significant portion of the natural habitat sacrificed for urban expansion is replaced by homes, businesses, and public medians and roadsides that are landscaped with gravel mulch and exotic ornamentals originally from other parts of the world. For native pollinators, such landscapes offer

about as much sustenance as an asphalt parking lot. The simple fact is that to survive, native pollinators need native plants.

So what good can a small backyard garden do to help sustain local pollinator populations? You'll be pleasantly surprised! Wildlife in the Southwest thrives in what ecologists call a patchy environment. Butterflies, bees, birds, and other pollinators forage over large areas, depending on their mobility, to find often ephemeral patches of food, water, shelter, and nesting sites. Spotty thunderstorms may stimulate a desert foothill mass bloom that only lasts a week or so. Storm runoff triggers a temporary bloom of desert willow and prairie clover along a normally dry arroyo, while a perennial trickle spring may support a small, summer-long succession of blooms.

Many of the temporary oases that pollinators frequent on their daily foraging routes are no larger than the average backyard. But our yards can be better than a here-today, gone-tomorrow stopover. The greater gardening goal goes beyond planting a patch of pretty flowers, though that's certainly commendable in itself. It encompasses the long-term development of a mini backyard refuge, a wildlife habitat that supplies the food, water, shelter and nesting sites that butterflies, bees, and birds require to support a year-round sustainable population.

Gardens start with a dream and build into a passion. This book will help you create a pollinator garden encompassing a diversity of plants with a variety of sizes and shapes, and with plants that bloom from early spring to late fall. So grab your spade—plant it and they will come!



Credit: USDA Plant Hardiness Zone Map, 2012. Agricultural Research Service, U.S. Department of Agriculture. Accessed from <https://planthardiness.ars.usda.gov/>.



Cactus flowers

GARDENING IN THE DRY SOUTHWEST

Designing and maintaining a pollinator garden—or, for that matter, any type of garden in the Southwest—requires considerations not required in other areas. In this region, which includes Las Vegas, Phoenix, Tucson, Flagstaff, Albuquerque, Santa Fe, and El Paso, one size does not fit all.

From parched low deserts that receive less than 5 inches of precipitation annually to high-altitude conifer forests with 30–50 inches a year, the Southwest encompasses five U.S. Department of Agriculture (USDA) ecoregion provinces—more than any single state. Each province is defined by different heat, rain, and temperature profiles and the plant communities they support. The region's USDA cold-hardiness zones range from 4b, with lows of -25°F , to 10b, with lows of a balmy 40°F .

Southwest gardens commonly experience extended droughts and triple-digit temperatures, with variations of 30°F in a single day. Climate models promise a near future with hotter, drier conditions that will stress even the most adaptable native flora and fauna—which is all the more reason to create a pollinator haven in your yard.

Before You Plant: Create a Master Plan

All too often gardeners see a pretty plant in a nursery and make a spur-of-the-moment purchase, then plant it in a spot that gives it little chance to survive, much less thrive. The goal here is to plan ahead to create a verdant, low-maintenance garden oasis with maximum pollinator benefit and prolonged seasonal beauty while also minimizing expenses from plant loss, replacement, and water usage.

Analyze Your Yard The first thing a professional landscaper would do is draw a plot of your yard to scale (for instance, 1 inch equals 5–10 feet). That's the best way for homeowners to start as well—nothing fancy, just sketch in existing plants, walkways, walls, and fences; then get creative.

First consider where you want individual specimen and accent plants. Then consider more-extensive border, entry, patio, and window-view gardens. If you have room, think about landscape ovals and islands and mass plantings. Decide where you need low-growing foreground and border

flowers, medium-size midgarden plants, and taller background shrubs and trees. Note the mature sizes in the plant profiles, and leave room for the plants to fill out.

Keep Sun Exposure in Mind The amount of sun and water a plant receives, are perhaps the most critical factors for a plant's survival. Except for conifer forests beginning at midelevations, the Southwest is dominated by grassland-shrub vegetation that receives full, direct sun, broken only with filtered shade from nearby small-leaved shrubs. Most native plants that thrive in the metropolitan Southwest require full sun to dappled shade.

In the plant profiles, **Full sun** means exposure to direct sun for 6 or more hours a day. **Dappled shade** means full sun but with filtered shade for 2–3 hours a day, especially in the blazing afternoons. Only a few desert plants thrive in **partial shade**, with 4–5 hours of no sun. Sun-adapted plants compromised by too much shade either die or respond with reduced blooming and leggy growth.

Now look at the shadow footprint of your house, walls, trees, and other shade-producing structures. From the shady north side of your house to the broiling southwest side, each nook and cranny creates a microhabitat guaranteed to effect how well a plant performs. Besides limiting sun exposure, a shady winter exposure can reduce the ground temperature in the root zone of a perennial by 10°F below the area's average low. Conversely, the reflected summer heat from a masonry wall can easily raise a plant's sustained heat load by 10°F or more.

Soil: Minerals, Nutrients, and Air

Plants need about 16 essential elements to grow, flower, and produce seeds. The carbon, oxygen, and hydrogen that produce carbohydrates required for plant growth come from air and water. Nitrogen (N), phosphorus (P), and potassium (K), the three key compounds in chemical fertilizers, come from minerals and microorganisms in the soil. The availability of roots to absorb these major and secondary compounds, and other micronutrients, depends on the pH, or acidity level, of the soil.



Arizona desert garden

The mineral components of Southwest soils tend to be coarse, fast-draining, and predominantly derived from limestone, with a pH between 7 (neutral) and 8.5 (slightly alkaline). Soils derived from decomposed granite, especially in foothills areas below granite mountains, tend to be slightly acidic. Native plants are perfectly adapted to thrive in the variations of native soil textures and pH, so only minor soil amendment may be required. On the other hand, introduced plants adapted to

more acid soils (pH 6–7) may struggle to absorb the minerals and nutrients they need, especially phosphorus, iron, and zinc.

Phosphorus is necessary for plant growth, photosynthesis, and sugar production. Deficiencies in nitrogen, phosphorus, or iron cause *chlorosis*, or leaves with yellowish areas between the green veins. Zinc deficiency causes malformed and damaged leaves. Avoid interplanting natives with exotics that require more-acidic soils or that have a higher water demand.

The native plants in your garden usually will not need strong doses of fertilizer or soil amendments to adjust the pH. A little compost worked into the soil surface and a thin layer of organic mulch to help retain soil moisture is usually all that is needed. Use a pH soil-test kit, available from garden centers, if you have reason to think a serious imbalance may exist.



In the dry Southwest, irrigation is key.

PRECIOUS WATER, POOR SOILS

Productive dry-climate garden soils contain about 50% air and 50% minerals (sand, silt, clay). Organic matter in the surface layer—composted plant material, microorganisms, fungi, bacteria—composes only about 1% of the total. The soil gaps provide oxygen necessary for the roots to respire. The spaces fill with water, and the roots absorb nutrients and minerals; then the water drains and the roots breathe again.

At low-to-mid elevations, Southwest native plants and their bloom cycles are adapted to periodic early-spring rains and late-summer monsoons. Downpours saturate the soil, separated by extended dry spells. The dominant soils are fast-draining, sandy, gravelly, loamy, and low in organics, so the roots completely dry out between rains. That's the water-and-soil formula for successful native plant gardens and landscapes.

Too little water not only limits blooming and growth but also makes plants look rangy and unappealing in a garden setting. Conversely, too much water can cause root rot, and garden soil rich in humus and organics can smother roots adapted to coarse soils with a high oxygen content. Fortunately, native plants are adaptable, so establishing a good water balance and maintaining a verdant garden aren't too difficult to manage.

The best way to extend blooming through periods of summer drought dormancy and maintain a lush, vibrant garden that keeps pollinators coming back is with a regulated-drip irrigation system. Soaker hoses looped along a border or through a garden, drip emitters at the base of individual plants, and mini-spray emitters for pocket gardens will saturate the soil surface on a regular schedule set by a timer. Vary the daily duration and number of days a week according to your garden's seasonal needs.

One heavy thunderstorm can produce hundreds of gallons of water that cascades off the average roof. If you don't catch the overflow in cisterns for future watering needs, it soaks into the ground and builds up a soil moisture bank. Most urban yards are sloped away from houses; as a result, the water slowly percolates through the soil downslope, creating a simulated arroyo effect.

Incorporating a sculpted landscaped drainage into your master design can help prevent water runoff into the street. And, depending on your base soil type, captured roof runoff could easily supply enough moisture to sustain a large tree or several shrubs, or an oval garden packed with wildflowers.

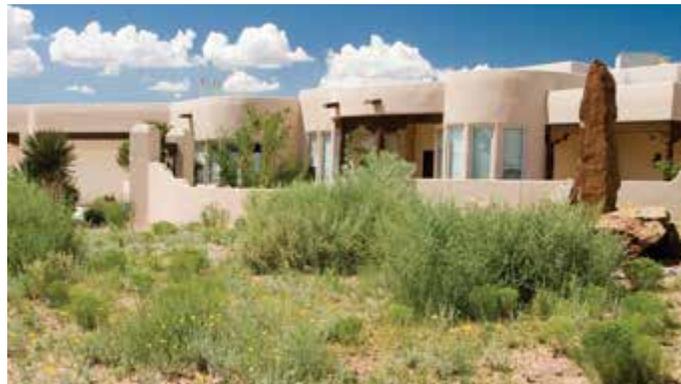
Gardening from the Ground Up

All too often, developers and their landscape architects create cookie-cutter subdivisions lined with yards covered with weed cloth and several inches of gravel. Stone aggregate stabilizes natural sandy, coarse soils, but it creates the environmental and visual equivalent of a parking lot, a dead zone for pollinators. A pollinator garden can transform a yard from a sterile layer of gravel or high-maintenance, thirsty turf grass into an organic, three-dimensional landscape.

A living landscape starts from the ground up, or actually with the fungus, bacteria, and microbes several inches below the surface. Bees dig nest burrows in bare ground, beetle and moth larvae pupate just below the surface, worms and bugs break down organic matter in the upper soil layers, and ground-foraging birds scratch for tidbits in the leaf litter.

Weed or Wildflower?

It depends on your perspective. For example, the City of Albuquerque and many homeowners associations wage a vicious battle against desert marigolds, which turn medians into solid sheets of gold. "Weeds!" they declare. Yet to pollinators, all those volunteer wildflowers are rich sources of pollen and nectar, as well as larval host plants. To a bee, the sterile petunias, pansies, hybrids, and cultivars with no pollen or nectar are the worthless weeds.



Weed or wildflowers desertscape

Dry Southwest gardens are not as overrun with unwanted intruders as gardens in wetter climates, but some weed control is inevitably needed. Manual removal is usually the most efficient, and far preferable to spraying a broad-spectrum herbicide containing glyphosate (Roundup). Court cases with billion-dollar settlements have ruled glyphosate a carcinogen, and many counties and municipalities in the Southwest have banned its use on public property.

If spraying is required, a popular effective solution is easy to make. Into 1 gallon of white vinegar, mix 2 cups of Epsom salt and ¼ cup liquid dish soap. Apply with a pump-type sprayer. The spray kills the foliage and shallow roots, but not necessarily deep taproots, unless you stream it on the base of the plant to soak in.

Mulching is one of the most important ways to manage weeds and sustain a healthy, living soil. The two general types of mulch, organic and inorganic, have a place in pollinator gardens. A modest layer of shredded bark, leaves, or compost around plants will keep the root zone cooler, slow soil evaporation, decrease water usage, add nutrients, and inhibit weed growth. A light layer of shredded bark will stabilize loose sandy areas without inhibiting bee and larvae nesting.

Much of the desert is covered with a fine layer of decomposed or pulverized rock and sand. Crusher fine rock mulch simulates the natural desert surface and can be used with many cacti, agaves, desert accents, and flowers such as plains zinnia and blackfoot daisy. Accent boulders and smaller rocks along borders and in pattern designs play dual roles as attractive design elements and important micro habitat stabilizers. The soil under a rock is cooler, retains moisture from condensation, and harbors a community of invertebrates relished by thrashers, towhees, and lizards.

One last consideration with your master plan is how formal you want your pollinator garden and yard landscape: neat and tidy, or more toward the wildscape look? Do you want a magazine-cover-worthy garden and yard with trimmed shrubs and confined borders, or do you want a naturalized habitat with a leaf and limb pile in the corner and a “forest” of 5-foot-tall sunflowers against the back wall? Whether you have room only for a few container plants on your balcony, a small landscape island, or a full-scale garden design for your yard, the butterflies, bees, and birds will benefit, and you will help repair the habitat lost because of our housing developments.



A welcome visitor to a native garden

ABCs for a Pollinator Habitat Garden

The Xerces Society, National Wildlife Society, Valle de Oro National Wildlife Refuge (Albuquerque), and other national and state agencies and organizations have certification programs for creating backyard wildlife habitats. They vary in particulars, but all center around certain basics: supply year-round sources of food, water, shelter, and nesting sites; plant at least 50% native plants; use no herbicides or pesticides; and avoid nursery plants treated with systemic neonicotinoids, pesticides that make pollen and nectar toxic to bees.

Gardens that cater specifically to pollinators have a few additional design requirements:

Water The first key element in your backyard oasis is a dependable source of water. Birds are attracted to the traditional birdbath, or you can get fancier with a solar-powered fountain, such as one with water cascading through different-size bowls. Bees like still, shallow water—a pan with pebbles on a drip emitter works great. Butterflies need moist soil, so an emitter on the ground, a garden with a drip system mini spray, or birdbath overflow is all they need.

Food Pollinators need energy-rich nectar and protein-rich pollen from the time they first emerge in the early spring, while foraging and nesting through the summer, and in the fall until they migrate or overwinter. Diversity is the rule in selecting plants, both to maintain a three-seasonal bloom and to present a variety of sizes and shapes to attract a diversity of butterflies, bees, other insect pollinators, and hummingbirds. A sugar-water feeder for hummingbirds will help supplement the natural flower food sources.

Shelter All animals need a refuge from wind, rain, and the relentless midday heat, and protection from predators. Butterflies need a sunny place to bask and warm up in the morning, and birds need shady day perches to rest while foraging, and leafy, protected night perches. A mix of perennial wildflowers, shrubs, a small tree, and several clumps of bunchgrasses will provide the necessary shelter.

Nest Sites A diverse population of pollinators cannot be sustained without successful nesting. For butterflies and moths, this means larval host plants. Each species lays its eggs on only the specific native plants that will nourish its caterpillars. Pretty exotic plants may supply lots of nectar and pollen, but only native plants will host the caterpillars. Most native bees are solitary and lay their eggs, along with a pollen ball for the larvae to eat, in a ground burrow they excavate or a cavity they find or drill in stems or limbs. Burrowing bees need bare ground free of thick mulch or other dense covering. Bee hotels with a variety of sizes of holes and tubes are popular for hole nesting bees. Bunchgrasses harbor overwintering bees and moth larvae.

Selecting Plants

Diversity is the key. Gardens with a variety of flower sizes and shapes attract the most kinds and numbers of pollinators. A well-balanced garden has a mix of annual and long-blooming perennial flowers and a few early-blooming shrubs. Leafy shrubs and a small- to medium-size tree will provide shelter from sun and wind and nesting sites for birds and bees. Also include at least two species of bunchgrass for moth larvae and overwintering bees.

You usually can look at a plant and tell what pollinates it. Some plants use a generalist strategy that offers a rich nectar–pollen buffet to all comers. These are garden favorites because of the large numbers and kinds of pollinators they attract. Members of the aster, rose, and verbena families include generalist plants that attract a variety of insects.

Conversely, many plants conserve resources by catering to a select few pollinators. No garden is complete without a selection of specialty flowers that add rich colors and attract iconic pollinators. Salvia, penstemon, and datura all attract unique pollinators.

The special characteristics that adapt a flower to a particular class of pollinators are called *syndromes*. Syndromes are only generally recommended, however, as insects will go wherever food is available.



Blackfoot daisies

PLANTING USING PLANT SYNDROMES



Bee Syndrome Flowers are shades of yellows and blues with nectar guidelines and either tubular, with an inflated shape to fit specifically sized bees, or open and bowl-shaped for all bees. Petals form a landing pad, nectar glands secrete abundant nectar, stamens produce rich pollen, and flowers are faintly scented. Members of the aster, verbena, and legume families include many plants attractive to bees.



Butterfly Syndrome Flowers are bright reds and purples with nectar guidelines, tubular-shaped with a narrow throat, and faintly scented. Petals form a landing pad, and flowers produce more nectar than pollen since butterflies don't gather pollen. Besides rich nectar plants, butterflies need host plants for their caterpillars. Almost every native plant hosts some types of caterpillars, but milkweeds are necessary for monarchs and queens, plus they provide abundant nectar for many insects.



Moth Syndrome Flowers are white or light colors visible in moonlight; they are either large and showy or small but in conspicuous clusters. They have a narrow, tubular throat; have nocturnal or crepuscular bloom times; and are strongly scented. Flowers last one day. Members of the evening primrose and four o'clock families are ideal for nocturnal gardens.



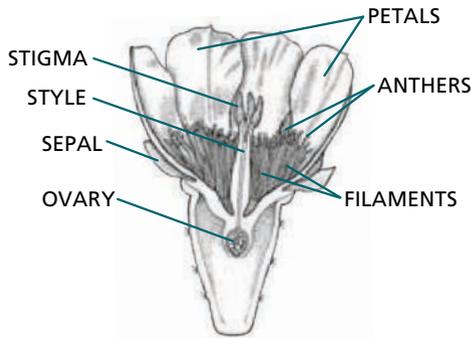
Beetle Syndrome Flowers are greenish and dish-shaped, produce abundant pollen and nectar, and are strongly scented. Beetles, some of nature's most colorful and diverse pollinators, have been pollinating flowers for 150 million years and feast on the pollen, petals, and developing seeds of almost any flower.



Hummingbird Syndrome Flowers are bright red to orange; tubular-shaped to fit bird bills; have no landing pad, guide lines, or scent; and produce abundant nectar. Penstemons, honeysuckles, and salvias add brilliant color and attract hummingbirds, but the birds will sip from almost any flower. Maintain a sugar-water feeder ($\frac{1}{4}$ cup sugar to 1 cup water) as a dependable source of food.

The Basics of Plant Anatomy

PARTS OF A FLOWER



STIGMA
+ STYLE
PISTIL

ANTHERS
+ FILAMENTS
STAMENS

Fossil records indicate that the pollination saga began 150 million years ago with beetles spreading pollen as they ate flower parts. Over millions of years of coevolution with insects, flowers gradually elicited the aid of flies, bees, butterflies, moths, and even birds, bats, and other nectar-eating creatures.

But make no mistake—flowers remain the ultimate puppet masters as they employ pollinators to move pollen

among flowers. Ingeniously using floral rewards with complex and nuanced strategies, they manipulate both the pollinators' behavior and its anatomy. The result is no less than an interconnected food web that sustains life on the planet.

Flower anatomy has diverged radically among species to attract a diversity of pollinators with the rewards of protein-rich pollen and energy-rich nectar. From thorny cacti to flamboyant lupines, sunflowers, and penstemons, the various parts of a plant are basically the same. Yet plants have modified and perfected every anatomical feature to attract pollinators, while at the same time, survive the most hostile environments.

Flowers serve one obvious purpose: to produce seeds for the continued survival of the plant. Many trees, grasses, and weedy plants eschew the dependence on animal pollinators and produce nondescript flowers that scatter copious amounts of pollen to the winds. The windborne misery of hay fever victims creates a booming industry for allergy doctors and drug companies. Conversely, the beauty of a colorful flower inspires poetry, romance, and wonder at the majesty of nature.

FLOWERS

The taxonomy of a flower defines the plant's species, groups it in a genus of similar plants, and places it in a family with broadly related features. The flower itself is a collection of modified leaves. **Petals** are usually the showy feature and are colored and marked to attract specific pollinators. They may spread open widely or be united to form a narrow tube that opens with lobes. Leaf-like **bracts** grow on the stem beneath the flower. They are typically green; but in some flowers, like paintbrushes, the bracts are more showy than the petals. **Sepals** surround and protect the bud and clasp the bottom of the flower. The **stamens**, the male feature, is a thin filament topped with anthers covered with pollen. The **pistil**, or female feature, consists of a tubular style that contains the ovaries and is topped with a stigma with lobes that receive the pollen. The shape of the stamen and stigma are often highly specialized to fit certain pollinators.

FLOWER CLUSTERS

To increase pollination efficiently, flowers make gathering pollen and nectar as simple as possible for the pollinator. Flying from flower to flower takes considerable energy, so plants with single flowers on a stem, especially annuals, are often synchronized with mass blooming. Flower clusters offer dozens of small flowers together so pollinators don't have to waste energy searching. Round or flat clusters provide a compact source of nectar and pollen, while spikes of flowers usually start blooming at the bottom so flowers bloom over an extended time. Lupine and milkvetch flowers often have white banner petals that turn red when pollinated so bees won't waste energy on flowers with no more nectar. Penstemon flowers are often on one side of the spike so hummingbirds can simply move upward and not have to circle the stem. Members of the Aster family have composite flower heads with showy petal-like ray flowers surrounding a compact disk with dozens of small tubular disk florets that produce pollen and nectar for a wide variety of pollinators.



Round- to flat cluster



Spike



Composite

LEAVES

The shape, size, and color of leaves, the food factories of a plant, can offer an extra ornamental dimension to a landscape. The size of a leaf can vary from a fraction of an inch (Apache plume) to several feet long (fern and palm fronds), and the shape from a simple oval or a deeply dissected or lobbed blade to a compound leaf with dozens of tiny leaflets. To reduce water loss by transpiration, leaves and leaflets in deserts tend to be small, often with waxy or densely woolly surfaces, and may be summer deciduous. Sun-loving plants die in the shade because sun- and shade-adapted plants produce carbohydrates using different photosynthetic pathways.

Leaves, as well as flowers, are an important feature in identifying a plant. Some flowers have a dense rosette of basal leaves, especially biennials that germinate the first year, overwinter as a rosette, and then bloom the second year. Notice if the leaves grow opposite or alternate each other, or in whorls around the stem. Does the leaf clasp the stem or have a short stalk (petiole)? Are the blades simple or compound; are the margins (edges) wavy, lobed, or smooth; are the surfaces hairy, rough, or smooth? Leaf features all help a plant adapt to its environment.

THORNY PLANTS

One of the most unique features of cacti is that their leaves have been modified into a network of spines that cover the succulent stems. The spines offer a lattice-like shade for the stem and deter thirsty animals like mice from eating the fleshy stems. Some cacti species have scattered spines;

others are densely covered; some have long, vicious spines; and others have hair-like spines. Prickly pears and chollas have an additional deterrent: each cluster (areole) of spines has a small patch of glochids—tiny, barbed bristles that cause extreme discomfort if they get lodged in skin.

Other desert plants have modified leaves with thorns on the tips or along the edges. Agaves and yuccas have long, stiff, sword-like leaves; sotols have long, narrow leaves lined with cat claw thorns; and many desert shrubs have thorny branches. Remember the saying that desert plants “stick, sting, or scratch,” and avoid planting them in areas of possible human contact.

Urban Wildlife

With the continuing loss of wildlife habitat to urban sprawl, a number of small mammals take refuge in parks, open space preserves, greenbelts, and even vacant lots. Coyotes, foxes, feral and domestic cats, rabbits, raccoons, skunks, and other small mammals from time to time may visit pollinator gardens and backyard wildscapes. Some, like deer and rabbits that feast on tender garden plants, may become nuisances and need to be fenced out, or they may make it necessary to cage delectable plants. The plant profiles indicate which plants are deer- and rabbit-resistant.

Any garden, especially one designed to be insect-friendly, will attract its share of creepy-crawly visitors. You might expect to see ants, spiders, scorpions, and centipedes. Black widow spiders, with their shiny black bodies with red ventral spots, are one critter to look out for. They favor dark corners like tool sheds, woodpiles, and even underneath patio chairs and tables. Unlike orb spiders, they build chaotic, tangled webs. Bites cause varying amounts of pain and discomfort, but over-the-counter pain medication usually suffices. Simple precautions like wearing gardening gloves when cleaning up or working in your garden usually provide ample protection. Most of these critters are delectable tidbits for ground-foraging birds and seldom a problem.



Antelope squirrel

Embracing Our Biological Heritage

Plants and pollinators are a part of our great natural heritage. Why can't our neighborhoods represent the natural plant diversity that existed before our houses were built? Our children could grow up familiar with the same plants that provided food and fiber for the Indigenous people who have lived in the Southwest for thousands of years. The plants that have sunk their roots in Southwest soil since the last ice age can help us understand that our psyches and society are equally rooted to the earth. As our pollinator gardens flower and fruit, we will be rewarded by the sight of butterflies dancing from flower to flower and by the melodies of birds singing in our trees.

Meet the Pollinators



Fossil records of beetles and flowers indicate that the pollination saga began about 150 million years ago. Since then, bees, butterflies, moths, flies, and wasps have joined the diverse cast, but the flowers themselves have always retained ultimate control of the show. The floral masters of manipulation have devised ways beyond the limits of human imagination to direct pollinator

behavior. Using rewards of energy-rich nectar and protein-rich pollen—along with deception, false advertising, bait and switch, entrapment, and even lethal measures—flowers engineer insects to transport their pollen in the most energy-efficient ways. This eons-old drama continues today on every flower in your pollinator garden.

BEES

The Southwest literally is paradise for bees. Of the more than 4,000 species that live in North America, at least 1,500 call our deserts, plains, foothills, and mountains home. These rock stars of the pollination world are the only animals that deliberately collect pollen. Adult bees feed on nectar, and with special hairs designed to hold pollen grains, the females collect pollen to store in their brood chambers for larvae to eat. Most bees are generalist feeders, but some prefer a specific family, genus, or even single species of flowering plants.

Though the bumblebee clan is social, 90% of bees are solitary, with each female creating her own set of brood chambers. She digs a borrow in bare ground, tunnels into a plant stem, or uses a pre-existing cavity. In a garden setting, easily constructed “bee hotels” with a variety of holes drilled in wood often fill up quickly.

At the end of her life span of approximately 6 weeks, the female seals off the last chamber and dies. Larvae develop over the winter and emerge in the spring, just in time for the early blooming flowers. By some unknown clues, specialty feeders synchronize their emergence with the bloom of their preferred species. Some may extend their dormancy several years if droughts suppress blooming.

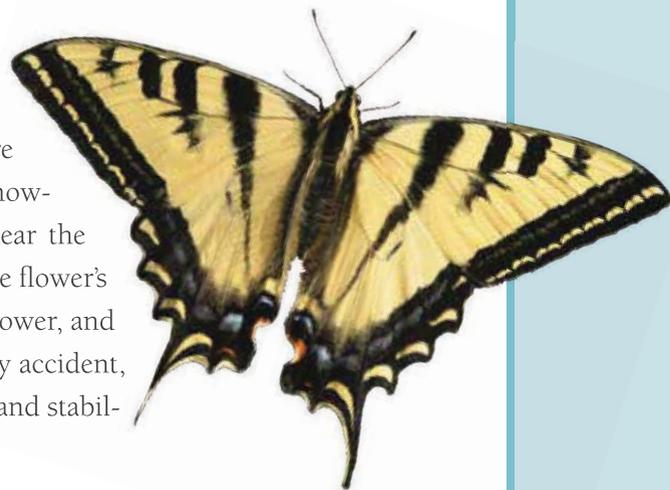
Bees in the Southwest vary in size from smaller than a grain of rice to robust, 1-inch-long bumblebees. Large bees can forage over a mile in distance, medium-size bees can range over 400–500 yards, small bees can venture 200 yards, and tiny bees can be confined to 200 feet. Ideally, the population of bees in your garden will be able to find the food and nesting sites in your and your neighbors' backyard gardens to complete their entire life cycle.



1. Valley carpenter bee (*Xyclopa sonora*) **2.** Honey bee (*Apis mellifera*) **3.** Cactus bee (*Lithurgoposis* spp.) **4.** Metallic green bee (*Agaapostemon melliventris*) **5.** Megachile bee (*Megachile* spp.) **6.** Hunt Bumblebee (*Bombus huntii*)

BUTTERFLIES

Of the approximately 800 species of butterflies in North America, about 400 occur in the Southwest. With brilliant colors and intricate patterns, these charismatic insects are among the star attractions in a pollinator garden. Ironically, however, in the scheme of efficient pollination, butterflies fall near the bottom of the list: with long legs that often hold them above the flower's pollen-bearing anthers, a long tongue to probe deep into the flower, and no body hair designed to collect pollen, butterflies pollinate by accident, not design. Even so, they are critically important to the health and stability of the ecosystem's complex food chain.



During their adult life span of 1–2 weeks, the females lay hundreds of eggs on specific host plants. The eggs hatch into caterpillars that relentlessly devour plant foliage. They increase their body mass by 10,000 times before entering metamorphosis. These juicy tidbits of protein feed the world of the wild. Ninety-five percent of songbirds depend on caterpillar protein to rear their hatchlings.

In the winter, or in times of drought, butterflies go into *diapause*, a period of suspended growth similar to hibernation. Diapause can occur at any life stage: egg, larva, chrysalis, or adult. A butterfly may be several years old by the time it becomes an adult. During winter diapause, caterpillars (of both butterflies and moths) nest in fallen leaves, bunchgrass stubble, or underground; chrysalides hang on protected twigs; and adults hide in woodpiles, cracks, or under loose bark. So when you tidy up your garden in the winter, be sure to reserve a place for overwintering butterflies and moths.

In the Southwest, butterfly activity peaks July–September. Darting from flower to flower or dancing in the sunlight overhead, they delight all ages. My preschool daughter called them “flutterbys,” which I think best describes these amazing creatures.



1. Arizona Sister (*Adelpha eulalia*) 2. Gulf Fritillary (*Agraulis vanillae*) 3. Monarch (*Danaus plexippus*) 4. Two-tailed swallowtail (*Papilio multicaudata*) 5. Black swallowtail (*Papilio polyxenes*) 6. Painted Lady (*Vanessa cardui*)

MOTHS

As night falls, nature’s night shift takes over. In a pollinator garden that means moths, which are among the most numerous and efficient classes of pollinators. With 12,000 species in the United States and 1,000 in the Southwest, moth species outnumber butterflies 12–1. Note the antennae: male moths have feathery, comb-like antennae, while the females’ are smooth and pointed; butterflies have smooth antennae with a swollen, club-like tip. Moths vary in size from ¼ inch to hummingbird-size sphinx and hawkmoths. They can be diurnal (such as police car moths), but most are crepuscular (such as sphinx moths and hawkmoths) or nocturnal.

Moths have the same metamorphic life cycle and host plant requirements as butterflies, but more are plant specialists.

Many plants have long floral tubes pollinated only by long-tongued moths, or they emit puffs of sweet aroma into the night to attract moths from far distances. Sacred datura, for instance, produces a high-octane, sugar-rich nectar laced with addictive hallucinogens to keep sphinx moths coming back night after night. As another example, each species of yucca depends on a single species of moth for pollination. The moth gathers pollen from one yucca and deposits it in the specially shaped stigma of a nearby yucca, then lays her eggs in the ovary so the larvae can eat the developing seeds. The larvae pupate in the ground and mysteriously don’t emerge until the yucca flowers again, which may take years.

Moths aren’t as showy as butterflies, but they are a vital part of the ecosystem food chain. Ninety-five percent of songbirds feed their nestlings moth caterpillars found on tree and shrub leaves, and many ground foraging birds feast on the nearly 50% of moths that pupate in leaf litter, bunchgrass thatch, and shallow soil. So be sure to include a selection of night-blooming wildflowers in your garden, such as sweet sand-abornia, sacred datura, and other members of the evening primrose (*Onagraceae*) and four-o’clock (*Nyctaginaceae*) families.



1. White-lined Sphinx moth (*Hyles lineata*) 2. Police car moth (*Gnophaela vermiculata*) 3. Columbia silkmoth (*Hyalophora columbia*) 4. Rustic Sphinx moth (*Manduca rustica*) 5. Army cutworm moth (*Euxoa* spp.) 6. Tiger moth (*Pyrrharctia isabella*)

FLIES

Don't gasp at the thought of attracting flies to your pollinator garden. This diverse order, with 125,000 classified species worldwide, includes many which are important pollinators second in importance only to pollination to bees. Flies have been recorded visiting at least 71 plant families. At higher altitudes with cold mornings and during inclement weather, flies are active much longer during the day than bees.

Flies vary in size from mere specks to an inch long. Many native flies are hairy and easily confused for bees, but flies have nubby antennae and big eyes, while bees have long antennae and smaller eyes.

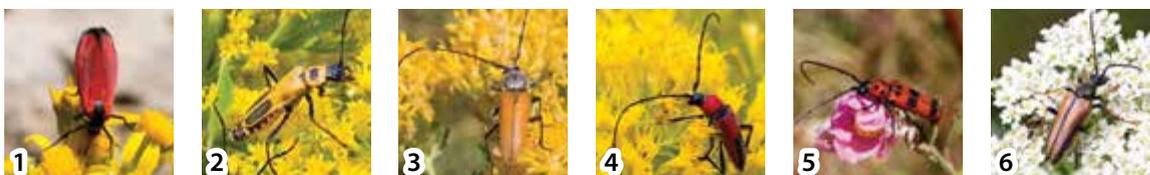
Flies, especially hoverflies (Syrphid family), are an important component of a pollinator habitat. The adults feed on nectar as they pollinate, and the larvae help control insect damage to plants. As carnivorous predators, the larvae complete the food web by feeding on aphids, spiders, other insects, and detritus. Most flies have short tongues and feed on shallow, flat flowers. They are critical pollinators for many plants in the carrot/parsley family (Apaceae), the aster family (Asteraceae), many annuals and small-flowering shade plants, and more than 100 human food plants, among them chocolate, carrots, tree fruits, berries, avocados, and mangos.



1. Bee fly (*Hemipenthes* sp.) 2. Bee fly (*Systoechus vulgaris*) 3. Flower fly (*Syrphus* spp.) 4. Red Tachinid fly (*Adejeania vexatrix*) 5. Bee-like Tachinid fly (*Hystricia abrupta*) 6. Tachinid fly (*Tachinidae* spp.)

BEETLES

Though thought to be the first insects to start the complex coevolution relationship between insects and flowers 150 million years ago, beetles are minor players in the saga today. Yet with 30,000 species in the United States, and 340,000 and counting in the world, the impact of beetles on the plant world is immense. Though much of their activity is detrimental, such as conifer forest devastation by bark beetles, they play critical roles as pollinators, decomposers, and predators. Ladybugs, for example, eat aphids both as larvae and adults. Beetles are necessary and beneficial in a well-balanced habitat and are generally welcome inhabitants in our gardens. A number of beetle families are important pollinators, but more by their clumsy rambling over flowers as they gulp nectar; munch away on pollen, petals, and flower parts; and search for sex partners. Scores of small beetles may congregate in a single cactus flower, and dozens of soldier beetles may crawl over the dense flower heads of goldenrods, while a single red-and-black flower beetle poses like the king of a flower. Beetles are some of the most bizarre and flamboyantly colored insects you'll find in nature, and they can be thrilling visitors in your garden.



1. Fire-colored beetle (*Pyrochroa* sp.) 2. Goldenrod Soldier beetle (*Chauliognathus pensylvanicus*) 3. Longhorn beetle (*Crossidius humeralis*) 4. Red Longhorn beetle (*Crossidius militaris*) 5. Spotted Tylosis longhorn beetle (*Tylosis maculatus*) 6. Soldier beetle (*Chauliognathus* sp.)

BIRDS

According to the National Audubon Society, Americans spend more money on bird feed and binoculars than on hunting and ammunition. By supplying the habitat needs of birds, your back window or patio can be an exciting place to bird-watch. A yard oasis, with shrubs and trees for nesting and shelter, fruit- and seed-bearing plants and a seed feeder for dependable food, and a constant water source, will support year-round resident birds and attract seasonal migrants.



Black-chinned Hummingbird

Only one hummingbird, the ruby-throated, is common east of the Mississippi River, while six species nest or regularly migrate into much of the Southwest. Eight others occur periodically along the border regions. Stock your garden with hummingbird adapted plants with tubular, red flowers, such as salvias, penstemons, and mints, supplemented with a sugar-water feeder to ensure a constant food source, and your garden will be a magnet for these energetic jewels of the bird world.

As a case in point, the Anna's hummingbird on the cover is the perfect example of how effective backyard habitat gardening can be. In 75 years, as home landscapes provided nectar-rich flowers and feeders, the hummer expanded its breeding range from southern California northward along the Pacific coast to Canada, and into the Southwest through much of Arizona. But the story doesn't end there. As climate warms, models project the bird will lose 28 percent of its southern range. It could shift its range east through central New Mexico, but only if food sources are available, primarily in the form of backyard habitat landscapes.

Native Plant Conservation

Because native plant populations are critical components of the ecosystem, you shouldn't collect native plants or seeds from the wild. This can harm existing habitat, threaten local native plant populations, and adversely affect pollinators and other wildlife that rely on them for food. What's more, collecting native plants from the wild may be illegal in some instances. Instead, always purchase or acquire native plants from a reputable grower or source (see page 271 for recommendations).



A cactus landscape

How to Use This Book

All of the plants in this book (with two unique exceptions) are native plants, and they are organized by type, with sections for **Desert Accents, Trees, Shrubs, Wildflowers, and Vines & Grasses**. Each plant profile includes information on the plant's size and growth pattern, hardiness zone, bloom period, and what it attracts, as well as specific notes about the plant.

When planning your garden, you can either find plants that strike your fancy by paging through the plant profiles in the body of the book, or you can consult the information in the back. See page 260 for a list of plants that attract butterflies, see page 262 for plants that attract bees, see page 266 for plants that attract feeding and nesting birds, and see page 267 for plants that specifically attract hummingbirds. Page 264 lists plants that are good for container gardening. Page 268 has a list of butterflies and plants that serve as larval hosts.

Once you have your garden planned out, turn to page 271 for a list of retail suppliers of native plants in the Southwest. Finally, see page 272 for a list of Southwest-focused native plant societies that you can contact for further information.

Southwest Plants at a Glance

To help organize your garden plant wish list, or to add new plants to existing plots, the following at-a-glance table helps you decide what and where to plant. It includes the hardiness zone; blooming period; whether a plant attracts butterflies, bees, or birds; and its likely deer/rabbit resistance.

For a well-balanced garden, choose a selection of plants that will provide blooms from early spring through summer and then into fall until the first frost. To maximize the numbers and diversity of pollinators, choose a mix of flowers with a variety of sizes and shapes.

Also remember that no plant is totally resistant to a hungry deer or rabbit—if necessary, enclose young, tender plants in a wire cage.



Mass-planted wildflower garden in Phoenix

Southwest Plants at a Glance

	COMMON NAME	SCIENTIFIC NAME	SOUTHWEST HARDINESS ZONE
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DESERT ACCENTS

	Beavertail Prickly Pear pg. 39	<i>Opuntia basilaris</i>	7a–10b
	Cane Cholla pg. 41	<i>Cylindropuntia imbricata</i>	5b–9b
	Engelmann's Prickly Pear pg. 43	<i>Opuntia engelmannii</i>	7b–10b
	Ocotillo pg. 45	<i>Fouquieria splendens</i>	7b–10b
	Parry's Agave pg. 47	<i>Agave parryi</i>	5a–11
	Purple Prickly Pear pg. 49	<i>Opuntia macrocentra</i>	7b–10b
	Red Yucca pg. 51	<i>Hesperaloe parviflora</i>	5a–10b
	Scarlet Hedgehog Cactus pg. 53	<i>Echinocereus coccineus</i>	4a–9b
	Sotol pg. 55	<i>Dasyllirion wheeleri</i>	7a–9b

TREES

	Blue Elderberry pg. 59	<i>Sambucus nigra</i>	6a–10b
	Desert Olive pg. 61	<i>Forestiera pubescens</i>	7a–10b
	Desert Willow pg. 63	<i>Chilopsis linearis</i>	7a–10b
	Netleaf Hackberry pg. 65	<i>Celtis reticulata</i>	4a–10b
	Smooth Sumac pg. 67	<i>Rhus glabra</i>	3a–9b

SHRUBS

	Apache Plume pg. 71	<i>Fallugia paradoxa</i>	4a–9b
	Autumn Sage pg. 73	<i>Salvia greggii</i>	7b–10b

ATTRACTS BUTTERFLIES	ATTRACTS BEES	ATTRACTS BIRDS	BLOOMING PERIOD	DEER-RESISTANT
no	yes	fruit	March–June	yes
yes	yes	yes	April–August	yes
no	yes	fruit	July–September	yes
no	yes	yes	April–June	yes
yes	yes	yes	June–August	yes
no	yes	fruit	March–June	yes
no	yes	yes	May–September	yes
no	yes	yes	March–April	yes
yes	yes	no	June	yes
yes	yes	fruit	May–August; fruit in fall	yes
yes	yes	fruit	March–April; fruit in summer	yes
yes	yes	yes	April–September	yes
host	no	fruit, shelter	summer–winter	yes
yes	yes	fruit	June–August	yes
yes	yes	seeds, shelter	April–October	yes
yes	no	yes	February–November	yes

Southwest Plants at a Glance (continued)

	COMMON NAME	SCIENTIFIC NAME	SOUTHWEST HARDINESS ZONE
	Brittlebush pg. 75	<i>Encelia farinosa</i>	8a–10b
	Broom Snakeweed pg. 77	<i>Gutierrezia sarothrae</i>	3a–10b
	California Buckwheat pg. 79	<i>Eriogonum fasciculatum</i>	8b–11a
	Chokecherry pg. 81	<i>Prunus virginiana</i>	2a–8b
	Cliff Fendlerbush pg. 83	<i>Fendlera rupicola</i>	6a–7b
	Desert Honeysuckle pg. 85	<i>Anisacanthus thurberi</i>	7a–10b
	False Indigo pg. 87	<i>Amorpha fruticosa</i>	4a–10a
	Fernbush pg. 89	<i>Chamaebatiaria millefolium</i>	4a–9b
	Firecracker Bush pg. 91	<i>Bouvardia ternifolia</i>	8a–10b
	Hummingbird Trumpet pg. 93	<i>Epilobium canum</i>	7a–10b
	Pale Wolfberry pg. 95	<i>Lycium pallidum</i>	4a–8b
	Pineapple Sage pg. 97	<i>Salvia elegans</i>	7b–11a
	Red Barberry pg. 99	<i>Berberis haematocarpa</i>	5a–10b
	Red Justicia pg. 101	<i>Justicia candicans</i>	9a–10b
	Rosemary pg. 103	<i>Salvia rosmarinus</i>	7a–10b
	Rubber Rabbitbush pg. 105	<i>Ericameria nauseosa</i>	4a–9b
	Texas Lantana pg. 107	<i>Lantana urticoides</i>	8a–11b
	Turpentine Bush pg. 109	<i>Ericameria laricifolia</i>	7a–10b
	Woods Rose pg. 111	<i>Rosa woodsii</i>	4a–8a
	Woolly Butterfly Bush pg. 113	<i>Buddleja marrubiifolia</i>	8a–11

ATTRACTS BUTTERFLIES	ATTRACTS BEES	ATTRACTS BIRDS	BLOOMING PERIOD	DEER-RESISTANT
yes	yes	seeds	February–May, August–September	no
yes	yes	no	July–November	yes
yes	yes	seeds	March–September	yes
yes	yes	fruit	April–May	yes
yes	yes	no	March–June	no
yes	no	yes	March–May	yes
yes	yes	no	April–June	yes
yes	yes	shelter	June–November	yes
no	no	yes	May–October	no
yes	yes	yes	June–October	yes
yes	yes	fruit	March–May	yes
yes	yes	yes	September–October	yes
yes	yes	fruit	March–May; fruit in summer–fall	no
yes	yes	yes	spring–fall	no
yes	yes	no	January–April	yes
yes	yes	shelter	July–October	yes
yes	yes	yes	April–October	yes
yes	yes	no	September–November	yes
yes	yes	no	April–August	yes
yes	yes	shelter	June–October	yes

	COMMON NAME	SCIENTIFIC NAME	SOUTHWEST HARDINESS ZONE
WILDFLOWERS			
	Antelope Horns Milkweed pg. 117	<i>Asclepias asperula</i>	5b–9b
	Arizona Red Columbine pg. 119	<i>Aquilegia desertorium</i>	5a–8b
	Black-Eyed Susan pg. 121	<i>Rudbeckia hirta</i>	3a–7b
	Blackfoot Daisy pg. 123	<i>Melampodium leucanthum</i>	5a–10b
	Blue Flax pg. 125	<i>Linum lewisii</i>	4b–9b
	Butterfly Milkweed pg. 127	<i>Asclepias tuberosa</i>	3a–9b
	Cardinal Flower pg. 129	<i>Lobelia cardinalis</i>	3a–9b
	Cardinal Penstemon pg. 131	<i>Penstemon cardinalis</i>	5a–8b
	Chocolate Flower pg. 133	<i>Berlandiera lyrata</i>	4a–10b
	Common Sunflower pg. 135	<i>Helianthus annuus</i>	2a–11b
	Desert Globemallow pg. 137	<i>Sphaeralcea ambigua</i>	7a–10b
	Desert Marigold pg. 139	<i>Baileya multiradiata</i>	7a–10b
	Desert Mule-Ears pg. 141	<i>Scabrethia scabra</i>	4a–9b
	Desert Penstemon pg. 143	<i>Penstemon pseudospectabilis</i>	5a–9b
	Desert Verbena pg. 145	<i>Glandularia gooddingii</i>	4a–7b
	Desert Zinnia pg. 147	<i>Zinnia acerosa</i>	6a–9b
	Five-Needle Dogweed pg. 149	<i>Thymophylla pentachaeta</i>	7a–10b
	Fleabane Daisy pg. 151	<i>Erigeron species</i>	5a–10b
	Gayfeather pg. 153	<i>Liatris punctata</i>	4a–9b

ATTRACTS BUTTERFLIES	ATTRACTS BEES	ATTRACTS BIRDS	BLOOMING PERIOD	DEER-RESISTANT
yes	yes	no	April–August	yes
yes	yes	yes	July–September	no
yes	yes	no	June–September	yes
yes	yes	no	April–October	yes
yes	yes	no	March–July	no
yes	yes	yes	May–September	yes
yes	yes	yes	July–October	yes
yes	yes	yes	May–July	yes
yes	yes	seeds	May–October	yes
yes	yes	seeds	June–September	yes
yes	yes	no	March–September	no
yes	yes	seeds	May–November	yes
yes	yes	no	May–August	yes
yes	yes	yes	March–July	yes
yes	yes	yes	March–October	yes
yes	yes	yes	April–October	yes
yes	yes	no	March–October	yes
yes	yes	no	April–September	no
yes	yes	yes	August–October	yes

Southwest Plants at a Glance (continued)

	COMMON NAME	SCIENTIFIC NAME	SOUTHWEST HARDINESS ZONE
	Giant Four O'Clock pg. 155	<i>Mirabilis multiflora</i>	5b–9b
	Golden Columbine pg. 157	<i>Aquilegia chrysantha</i>	3b–9b
	Golden Crownbeard pg. 159	<i>Verbesina encelioides</i>	5a–8b
	Greenthread pg. 161	<i>Thelesperma filifolium</i>	5a–9a
	Hairy Goldenaster pg. 163	<i>Heterotheca villosa</i>	5a–8b
	Hartweg's Sundrops pg. 165	<i>Oenothera hartwegii</i>	6a–10b
	Horsetail Milkweed pg. 167	<i>Asclepias subviticillata</i>	3a–9b
	Hummingbird Mint pg. 169	<i>Agastache cana</i> (hybrid)	5b–9b
	Indian Blanket pg. 171	<i>Gaillardia pulchella</i>	3a–10b
	Low Larkspur pg. 173	<i>Delphinium nuttallianum</i>	6a–9a
	Mexican Golden Poppy pg. 175	<i>Eschscholzia californica</i>	7b–10b
	Palmleaf Mistflower pg. 177	<i>Conoclinium dissectum</i>	7a–10b
	Palmer's Penstemon pg. 179	<i>Penstemon palmeri</i>	4b–10b
	Parry's Penstemon pg. 181	<i>Penstemon parryi</i>	8a–10b
	Pink Mexican Evening Primrose , pg. 183	<i>Oenothera speciosa</i>	5a–9b
	Plains Zinnia pg. 185	<i>Zinnia grandiflora</i>	4a–9b
	Plateau Goldeneye pg. 187	<i>Viguiera dentata</i>	7a–13b
	Prairie Coneflower pg. 189	<i>Ratibida columnifera</i>	4a–9b
	Purple Aster pg. 191	<i>Dieteria canescens</i>	4a–10b
	Purple Prairie Clover pg. 193	<i>Dalea purpurea</i>	4a–8b

ATTRACTS BUTTERFLIES	ATTRACTS BEES	ATTRACTS BIRDS	BLOOMING PERIOD	DEER-RESISTANT
yes; also hawkmoths	yes	yes	May–September	yes
yes	yes	yes	April–September	no
yes	yes	seeds	April–October	yes
yes	yes	no	March–October	yes
yes	yes	no	June–September	yes
yes	yes	no	April–September	yes
yes	yes	no	June–September	yes
no	no	yes	July–September	yes
yes	yes	yes	April–October	yes
yes	yes	yes	March–July	yes
yes	yes	no	March–May	yes
yes	yes	no	April–October	yes
yes	yes	yes	June–July	yes
yes	yes	yes	February–May	no
yes	yes	seeds	July–August	yes
yes	yes	no	May–October	yes
yes	yes	no	June–October	yes
yes	yes	no	June–September	no
yes	yes	no	May–October	yes
yes	yes	no	May–September	no

Southwest Plants at a Glance (continued)

	COMMON NAME	SCIENTIFIC NAME	SOUTHWEST HARDINESS ZONE
	Rocky Mountain Beeplant pg. 195	<i>Peritoma serrulata</i>	3a–8b
	Rocky Mountain Penstemon pg. 197	<i>Penstemon strictus</i>	4a–9b
	Sacred Datura pg. 199	<i>Datura wrightii</i>	5–11
	Sand Penstemon pg. 201	<i>Penstemon ambiguus</i>	6a–9b
	Scarlet Betony pg. 203	<i>Stachys coccinea</i>	7a–10b
	Scarlet Bugler Penstemon pg. 205	<i>Penstemon barbatus</i>	4a–9a
	Showy Goldeneye pg. 207	<i>Helioomeris multiflora</i>	4a–8b
	Showy Milkweed pg. 209	<i>Asclepias speciosa</i>	3a–9b
	Smooth Blue Aster pg. 211	<i>Symphyotrichum laeve</i>	4a–8b
	Spike Verbena pg. 213	<i>Verbena macdougalii</i>	4a–8b
	Sulphur-Flower Buckwheat pg. 215	<i>Eriogonum umbellatum</i>	4a–8b
	Sweet Sand Verbena pg. 217	<i>Abronia fragrans</i>	4a–8b
	Tahoka Daisy pg. 219	<i>Machaeranthera tanacetifolia</i>	5a–11a
	Threadleaf Groundsel pg. 221	<i>Senecio flaccidus</i>	4a–7b
	Three-Nerve Goldenrod pg. 223	<i>Solidago velutina</i>	4a–10b
	Tufted Evening Primrose pg. 225	<i>Oenothera caespitosa</i>	4a–10b
	Western Pearly Everlasting pg. 227	<i>Anaphalis margaritacea</i>	3a–7b
	Western Spiderwort pg. 229	<i>Tradescantia occidentalis</i>	4a–9b
	Western Wallflower pg. 231	<i>Erysimum capitatum</i>	4b–9b
	Western Yarrow pg. 233	<i>Achillea millefolium</i>	4a–9b

ATTRACTS BUTTERFLIES	ATTRACTS BEES	ATTRACTS BIRDS	BLOOMING PERIOD	DEER-RESISTANT
yes	yes	yes	June–August	yes
yes	yes	yes	May–July	yes
hawkmoths	yes	no	May–October	yes
yes	yes	yes	May–September	yes
yes	yes	yes	March–October	yes
yes	yes	yes	June–September	yes
yes	yes	no	July–October	yes
yes	yes	no	May–September	yes
yes	yes	no	August–October	yes
yes	yes	no	June–September	yes
yes	yes	no	April–September	yes
yes	yes	no	April–September	yes
yes	yes	no	May–September	yes
yes	yes	no	April–November	yes
yes	yes	no	July–October	yes
yes; also hawkmoths	yes	no	April–September	yes
yes	yes	no	June–September	yes
yes	yes	no	April–September	yes
yes	yes	no	March–September	yes
yes	yes	no	April–July	yes

	COMMON NAME	SCIENTIFIC NAME	SOUTHWEST HARDINESS ZONE
	White Heath Aster pg. 235	<i>Symphyotrichum ericoides</i>	5a–10b
	White Prairie Clover pg. 237	<i>Dalea candida</i>	3a–8b
	Wild Bergamot pg. 239	<i>Monarda fistulosa</i>	3a–8b
	Woolly Paperflower pg. 241	<i>Psilostrophe tagetina</i>	5a–8b

VINES & GRASSES

	Arizona Honeysuckle pg. 245	<i>Lonicera arizonica</i>	5a–9b
	Milkweed Vine pg. 247	<i>Funastrum cynanchoides</i>	7a–11b
	Thicket Creeper pg. 249	<i>Parthenocissus inserta</i>	4b–8b
	Western White Clematis pg. 251	<i>Clematis ligusticifolia</i>	5a–10b
	Deer Grass pg. 253	<i>Muhlenbergia rigens</i>	7a–10b
	Indian Ricegrass pg. 255	<i>Achnatherum hymenoides</i>	4a–7b
	Mexican Feather Grass pg. 257	<i>Nassella tenuissima</i>	6a–10b
	Purple Three-Awn pg. 259	<i>Aristida purpurea</i>	6a–10b

ATTRACTS BUTTERFLIES	ATTRACTS BEES	ATTRACTS BIRDS	BLOOMING PERIOD	DEER-RESISTANT
yes	yes	no	July–October	yes
yes	yes	no	May–September	no
yes	yes	yes	June–August	yes
yes	yes	no	March–October	yes
yes	yes	yes	May–July	yes
yes	yes	no	April–September	yes
host	yes	shelter	June–August	yes
yes	yes	no	July–September	yes
host	shelter	no	July–October	yes
host	shelter	seeds	July–September	no
host	shelter	no	July–September	yes
host	shelter	no	April and October	yes



Purple Prickly Pear



Ocotillo

Desert Accents



Sotol, Desert Spoon



Parry's Agave



Beavertail Prickly Pear



Engelmann's Prickly Pear

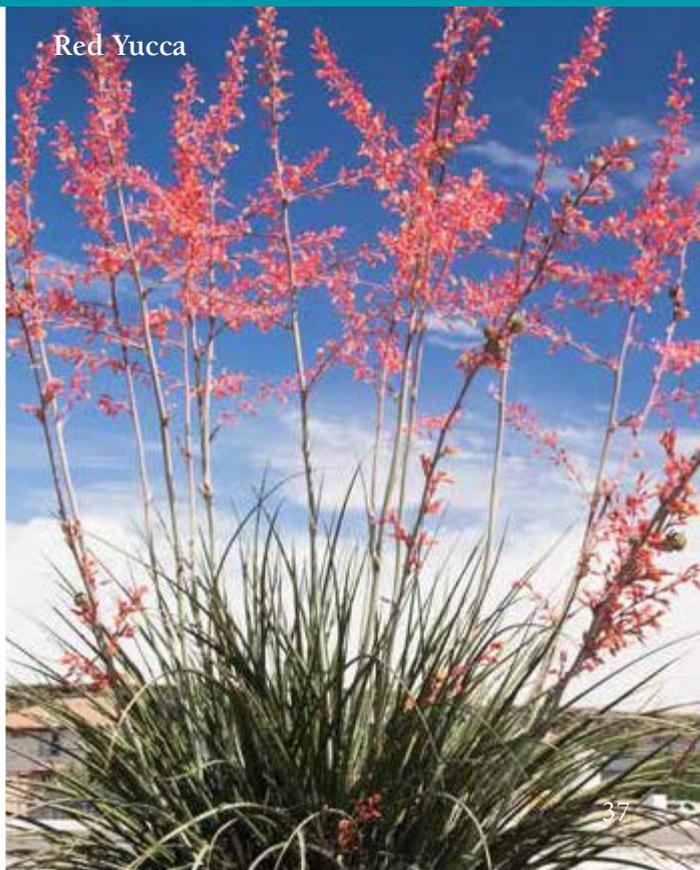


Scarlet Hedgehog Cactus

Though the Southwest encompasses ecosystems and landscapes from high-mountain meadows to forests of pine, spruce, and fir, the desert harbors the most iconic plants of the region. Nothing imparts a Southwest sense of place more than cacti, yuccas, agaves, and sotol, whether in nature or your yard. The large stand-alone accents and the smaller rock garden fill-ins burst into bloom with scene-stealing flowers, but that's not all. They provide year-round beauty with ornate rosettes of leaves or clusters of thorny stems. With flamboyant, pollen- and nectar-rich flowers and succulent fruit, desert accents host a number of insect pollinators, birds, and small mammals. Add a few to your design and enjoy the benefits all year.



Cane Cholla



Red Yucca



Beavertail Prickly Pear

Scientific Name *Opuntia basilaris*

Family Cactus, Cactaceae

Plant Characteristics Low-growing clusters, 2–3 feet high and wide, have dozens of jointed, 4-inch-wide, blue-green pads; long spines are absent, but tiny, barbed bristles are painful if touched; flowers are hot pink to magenta, 2–3 inches wide; fruit is barrel-shaped, dry, tan, spineless. Deer- and rabbit-resistant.

USDA Hardiness Zones 7a–10b

Bloom Period Spring–early summer–fall (March–June)

Growing Conditions Performs best with full sun; well-draining, sandy, gravelly soils; no supplemental water.

The blue-green pads of this small-scale, shrubby prickly pear make an attractive accent to a cactus garden, but it becomes the dominant highlight when brilliant pink flowers cover the plant. The oval pads lack long spines and, when tipped with rose-like flowers, provide a vivid contrast to yellow-flowered cacti with showy spines. Beavertail pads may turn reddish-purple in cold temperatures. To provide seasonal color, mix with low-growing, drought-tolerant perennial and annual wildflowers like desert marigold, purple aster, Tahoka daisy, and plains verbena. Though spineless, the pads of beavertail, like all prickly pear cacti, are dotted with rows of tiny, barbed bristles (glochids) that cause considerable discomfort if touched and must be removed with tweezers. Always distance prickly pears from human contact.

The flowers attract cactus bees and native flies and wasps; flowers, fruit, and dead tissue are larval host foods for several species of moths.



Cane Cholla

Scientific Name *Cylindropuntia imbricata*

Family Cactus, Cactaceae

Plant Characteristics Branching stems with jointed segments reach 3–8 feet tall with short trunks; spines are 1 inch long, in clusters with tiny, barbed bristles; showy magenta flowers 3–4 inches wide bloom on stem tips. Deer- and rabbit-resistant.

USDA Hardiness Zones 5b–9b

Bloom Period Spring–summer (April–August) depending on rains

Growing Conditions Performs best in full sun and dry, well-draining soil.

The tall, airy, thorny branches of cane cholla (and equally the other tree cholla species in the Southwest) create an ornamental focus for a cactus garden or xeriscape island, but position far away from any possible human contact. To the delight of bees both large and small, the magenta flowers bloom profusely in vivid clusters, followed by bright-yellow, box-like fruits that remain through winter. Complementary plantings of desert wildflowers, such as brittlebush, broom snakeweed, and tansy aster, will add a three-season pollen source and colorscape. No supplemental water needed, but in the driest summers, a deep watering may stimulate flowering. In Arizona and westward, consider teddybear cholla (*C. bigelovii*), a bushy, 3- to 7-foot-tall cholla densely covered with long, yellowish spines. It has pale-yellow to greenish flowers and is cold-hardy to 15°F. Chollas grow easily and readily propagate by rooting broken joints.

Attracts hummingbirds, cactus bees, and other small insects.





Engelmann's Prickly Pear

Scientific Name *Opuntia engelmannii*

Family Cactus, Cactaceae

Plant Characteristics Large-scale cactus with clumps potentially reaching 3–9 feet high and wide; large, oval pads up to 15 inches long and wide, with 1–6 flattened chalky-white or yellowish spines; flowers solid yellow, occasionally orange-tinted; fruit is barrel-shaped, deep red to purple, juicy. Deer- and rabbit-resistant.

USDA Hardiness Zones 7b–10b

Bloom Period Summer–fall (July–September)

Growing Conditions Full sun; well-draining, sandy, gravelly soils; no supplemental water necessary.

This mighty cactus can take over all but the largest pollinator gardens, so give it plenty of room. Use as a large accent in an open space, as a border or wall planting, in naturalized areas, or even as a security hedge, but always plant away from human contact. Widespread sets of white to yellowish thorns and clusters of tiny, barbed bristles dot the saucer-size pads. The bushy labyrinth creates shelter and nesting sites for roadrunners, wrens, thrashers, and other desert birds. In the summer, a large plant will produce dozens of showy lemon-yellow flowers every day for a week or so, followed by juicy red fruit favored by birds, small mammals, and by humans for jelly and a refreshing watermelon-flavored drink. Several regional varieties occur, including a popular red-flowered cultivar. The cow tongue variety has unusual elongated pads.

Flowers attract native bees and other small insect pollinators; birds and small mammals devour the fruit.



Ocotillo

Scientific Name *Fouquieria splendens*

Family Ocotillo, Fouquieriaceae

Plant Characteristics A single root crown produces numerous 8- to 20-foot-tall, thorny, leafless, whip-like stems; appears dead until spring and summer rains stimulate growth of 1-inch leaves and showy spikes of flamboyant red flowers. Deer- and rabbit-resistant.

USDA Hardiness Zones 7b–10b

Bloom Period Spring–early summer (April–June)

Growing Conditions Full sun; gravelly, well-draining soil.

With a vase-like array of tall, wand-like stems, this distinctive desert icon bursts to life in the spring with a stunning display of flower spikes on the stem tips. Hummingbirds, songbirds, and a variety of insects flock to the nectar bonanza. It naturally occurs with creosote bush, agaves, cacti, and foothill bunchgrasses and shrubs. Plant it as a stand-alone specimen or xeriscape garden accent, near a wall for reflected heat, or surrounded with desert perennial and annual flowers for three-season color. Ocotillos are protected but occasionally available at nurseries as a bare-rooted salvage plant (look for the permit tag on the plant); transplant in the cool of fall or spring directly into well-draining soil.

*Spring blooming coincides with northward migrating hummingbirds; also attracts songbirds, bees and other insects; larval host for calleta silkworm (*Eupackardia calleta*); seeds provide abundant food for birds and small mammals.*



Parry's Agave

Scientific Name *Agave parryi*

Family Asparagus, Asparagaceae

Plant Characteristics Tight rosette of succulent, rigid, grayish-green, spine-tipped leaves lined with catclaw teeth; branched flower stalk rises 10–20 feet with dense, plate-size clusters of tubular, golden-yellow flowers; plant lives for years and produces many pups, then dies after flowering. Deer- and rabbit-resistant.

USDA Hardiness Zones 5a–11 depending on variety

Bloom Period Summer (June–August)

Growing Conditions Full sun and well-draining soil. Water every 10–20 days in harsh conditions.



Drought, heat, and freeze-tolerant, this adaptable desert icon grows from desert grasslands to ponderosa forests. The rounded rosette of thick, spine-tipped leaves reaches 2 feet high and 3 feet wide. It provides an attractive wall accent, a groundcover mixed with bunchgrasses and wildflowers, a cacti or rock garden focal point, or a border accent, but avoid areas with possible human contact. Buds on the towering flower stalk can be an attractive reddish, but the biggest prize is the numerous flower clusters packed with nectar-and pollen-rich blooms. The all-you-can-eat flower feast attracts hummingbirds and all manner of insects. Agaves usually produce a number offshoots, or pups, as they mature; then, after its dramatic moment of glory, the mother plant dies. Several varieties with different-size leaves and cold tolerance occur in the nursery trade. Low desert agave species are just as attractive, and some are much larger but not as cold-tolerant.

*Attracts hummingbirds, bats, bees, and other insect pollinators; larval host for the orange giant-skipper (*Agathymus neumoegeni*) and Huachuca giant-skipper (*Agathymus evansi*) butterflies.*



Purple Prickly Pear

Scientific Name *Opuntia macrocentra*

Family Cactus, Cactaceae

Plant Characteristics Shrubby, 3 feet tall and wide; rounded, blue-green pads are tinged with purple to solid reddish-purple when stressed by temperature or drought; dark to white spines are 2–6 inches long, especially along top edge; yellow flowers have a bright-red center; fruit is purple, juicy. Deer- and rabbit-resistant.

USDA Hardiness Zones 7b–10b

Bloom Period Spring–summer (March–June)

Growing Conditions Best in full sun and sandy, gravelly, well-draining soil.

Also called long-spined prickly pear, this highly ornate midsize cactus has distinctive blue-green to reddish-purple pads lined with long spines, showy yellow flowers with bright-red centers, and juicy purple fruit. When in bloom, it's a summer showstopper in a cactus or xeriscape garden, as a wall accent, or as a foundation planting. In the winter, the purplish pads provide a striking color contrast to a dormant cactus garden. For four-season colorscaping, combine with wildflowers like desert marigold, desert mule-ears, plains zinnia, or plains verbena. Always plant prickly pear cacti with their sharp spines and wicked barbed hair-like bristles away from human contact. Variability in nature includes pads covered with long spines, spines only on the top edge, or spines absent. As with all prickly pear cacti, the pads or a segment of several pads removed at a joint will root easily and grow rapidly. A number of varieties of purple prickly pears in the nursery trade are lumped into this species.

Flowers attract hummingbirds, cactus bees, and other small insect pollinators. Birds and mammals enjoy the fruit.



Red Yucca

Scientific Name *Hesperaloe parviflora*

Family Asparagus, Asparagaceae

Plant Characteristics Dense rosettes of stiff, leathery, narrow leaves lined with curling threads but no thorns, form 3-foot-tall and wide clumps; flower stems reach 5 feet tall with loose spikes of tubular red flowers. Deer- and rabbit-resistant.

USDA Hardiness Zones 5a–10b

Bloom Period Spring–Fall (May–September)

Growing Conditions Performs best with full sun, tolerates dappled shade; needs well-draining soil.

Though native to south Texas, this hardy, adaptable plant is a mainstay of xeric landscape designs across the Southwest. The dense basal cluster of ornate gray-green leaves with reddish tints produces tall, arching stalks lined with coral-colored tubular flowers that bloom all summer. The compact plant spreads each year and can have 12 or more flowering stalks. Unlike true yuccas, it has no thorns, so it's safe to use along walkways and in patio plantings. It makes an attractive focal point for a hummingbird garden or landscape island, or as a border along sidewalks and medians. It thrives as a large container plant and makes a colorful, long-blooming companion for bunchgrasses, agaves, and other pointy desert accents. Mix red, pink, and yellow cultivars for a unique colorscape. The plant gets wider every year, so give it ample room to spread. The larger giant hesperaloe (*H. funifera*), with branching, 12-foot-tall flower stalks and white flowers, has similar landscape uses.

Pollinated by hummingbirds; also attracts bumblebees and small bees.



Scarlet Hedgehog Cactus

Scientific Name *Echinocereus coccineus*

Family Cactus, Cactaceae

Plant Characteristics Cylindrical, spine-covered stems reach 8 inches tall by 4 inches wide and can form dense, rounded clumps with 5–20 or more stems; flowers red, waxy-looking, 2 inches wide. Deer- and rabbit-resistant.

USDA Hardiness Zones 4a–9b

Bloom Period Spring (March–April)

Growing Conditions Full sun to dappled shade; gravelly, sandy, well-draining soil.

Also called claret cup cactus, this cold-hardy cactus spreads to form mounding clumps covered with brilliant red flowers in the early spring. Unlike many cacti, the flowers don't close at night and last several days, so the clump maintains blooms for several weeks. The flower size is especially adapted for the size of the hummingbird's head, not its bill-like tubular red wildflowers, but it's also a magnet for bees. It makes a flamboyant accent for rock gardens and desert accents like ocotillo and agaves, and under small trees and airy desert shrubs like desert willow, desert olive, and a trimmed-up fenderbush or Apache plume. The look-alike kingcup hedgehog (*E. triglochidiatus*) grows singly or in small clusters, is taller, and has fewer spines.

Attracts hummingbirds, bees, and other small insect pollinators.



Sotol, Desert Spoon



Scientific Name *Dasyilirion wheeleri*

Family Asparagus, Asparacaceae

Plant Characteristics Perennial evergreen rosette 3–5 feet tall and wide, has hundreds of arching, leathery leaves; leaves flat, narrow, 2–3 feet long, lined with catclaw thorns; nondescript flowers line a woody, pole-like, 10- to 15-foot-tall stalk; male (pollen bearing) and female (seed bearing) flowers are on different plants. Deer- and rabbit-resistant.

USDA Hardiness Zones 7a–9b

Bloom Period Summer (June)

Growing Conditions Requires full sun and natural, well-draining soil.

With a huge rosette comprising hundreds of blue-green, vicious, thorn-lined leaves, this distinctive desert icon spends most of its life as a large-scale evergreen accent. But for the patient gardener, the reward is worth the wait of up to 7 years for the plant to mature and bloom. Magically, a bloom stalk emerges and doesn't stop growing until it's 15 feet tall and lined with inconsequential-looking, cream-colored flowers, unless you're a bee. The hundreds of pollen- and nectar-rich flowers draw multitudes of bees large and small for several weeks as the flowers mature in sequence. The male plants produce pollen while the females reward bees with nectar, then produce copious amounts of seeds. If you can resist cutting out the spent flower stalk, it becomes a bee hotel. Bees and beetles drill into the soft wood to build their nests. Sotols do not die after flowering, but they may not flower every year. The large rosette makes a dramatic specimen focal plant.

Attractive to butterflies, bees, bumblebees, and other pollinators.



Desert Olive

Trees



Desert Willow



Smooth Sumac



Blue Elderberry

A large canopy tree requires the equivalent of 35+ inches of annual precipitation, conditions found only in riparian floodplains in the Southwest. Desert trees are smaller, usually growing along arroyos and drainages that get periodic pulses of rain. They may be summer deciduous and triggered by rain to bloom. A yard can duplicate these natural conditions, prolonging the bloom period through the summer. Several small trees will fit in a home-scale landscape and provide food, shelter, and host plants for a variety of insects, birds, and other wildlife.



Netleaf Hackberry



Blue Elderberry

Scientific Name *Sambucus nigra* ssp. *cerulea*

Family Elderberry, Adoxaceae

Plant Characteristics Deciduous shrub to small tree 6–12 feet tall with single or multiple ornate, branching trunks; small, yellowish-white flowers in flat, 4- to 8-inch-wide clusters followed by blue-black drupes. Deer- and rabbit-resistant.

USDA Hardiness Zones 6a–10b

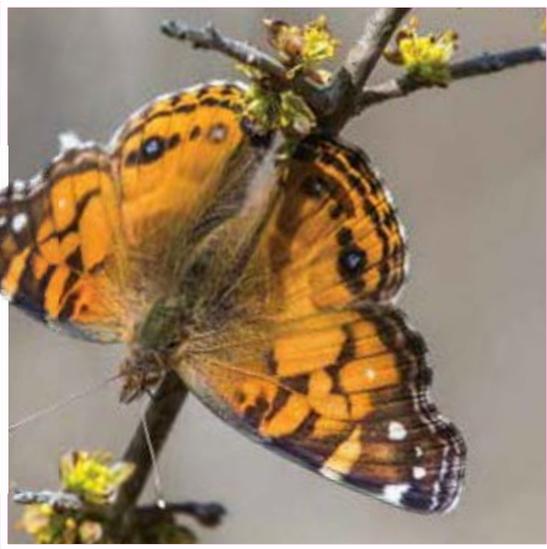
Bloom Period Summer (May–August); fruit in fall (August–October)

Growing Conditions Full sun to partial shade and well-draining, moist soil.

Ideal for urban yards as accent or specimen plantings. Also called Mexican elderberry, this small-scale tree or dense shrub offers three-season benefits for pollinators and birds, as well as long-lasting beauty for your yard. Large clusters of small, creamy flowers provide a rich source of nectar in the spring, and the blue-black berries feed birds in the fall. Additionally, the intricate branching and large compound leaves provide shade and perching and nesting shelter for birds. Native to drainages and stream sides, this moderately drought-tolerant plant needs additional water in hot, dry summers to keep its best appearance. Elderberries can flower the second year from seed and become shrub-size in 3–4 years. They sucker from the base so may need regular pruning to shape and keep attractive. The berries, sweet when fully ripe, have many traditional food and medicinal uses, but red fruiting species are toxic.

Flowers attract hummingbirds, butterflies, bees, and other insect pollinators. Foliage provides shade, shelter, and nesting sites; seeds are an important late summer food for birds.





Desert Olive

Scientific Name *Forestiera pubescens* var. *pubescens*

Family Olive, Oleaceae

Plant Characteristics Bushy, multitrunked shrub or small tree to 15 feet tall with dense branching; small deciduous leaves turn yellow in the fall; inconspicuous flowers appear before the leaves, clusters of blue-black drupes ripen in late summer; male and female flowers on separate plants so both are needed to produce fruit. Deer- and rabbit-resistant.

USDA Hardiness Zones 7a–10b

Bloom Period Spring (March–April); fruit in summer (July–September)

Growing Conditions Full sun to partial shade and well-draining, sandy to loamy, occasionally moist soils.

Also called spring herald, this is one of the first plants to provide nectar for bees and butterflies in the spring. Tiny clusters of yellow flowers bloom before the leaves emerge. Prune this multitrunked shrub into a small tree to highlight the ornate stems. Use along a wall or walkway, as a rear-garden accent, or with a colorful understory of flowers or grass accents. Or trim it as a dense, rounded hedge or accent shrub. Birds find shelter and nesting sites in the intricate branching and feast on the small, fleshy drupes in late summer. This drought- and heat-tolerant, thicket-forming plant naturally grows along arroyos and periodic drainages, so an occasional deep watering will keep it in prime appearance.

*Inconspicuous flowers attract butterflies, bees, and a host of other insect pollinators; it's a larval host plant for incense cedar sphinx (*Sphinx libocedrus*); important source of food and cover for birds.*



Desert Willow



Scientific Name *Chilopsis linearis*

Family Bignonia, Bignoniaceae

Plant Characteristics Small to medium, fast-growing, deciduous tree, 10–20 feet tall with narrow leaves, showy flowers, pencil-size seed pods; creates dappled shade. Deer- and rabbit-resistant.

USDA Hardiness Zones 7a–10b

Bloom Period Spring–summer (April–September)

Growing Conditions Full sun to partial shade; needs sandy, gravelly, loamy, occasionally moist, well-draining soil.

With clusters of large, orchidlike, pink to magenta flowers, this adaptable mainstay of Southwest landscapes will beautify your yard and attract hummingbirds, butterflies, and bees. The intricate branches provide shade, shelter, and nesting sites for birds. Train it against a wall, into a multitrunked focal plant, or a medium-size, single-trunked tree for yard shade or median strips. This small-scale tree naturally grows along arroyos and periodic drainages, so a monthly deep watering will simulate natural thunderstorms and keep it blooming most of the summer. It blooms on new growth, so judicious pruning increases flowering. Nurseries sell cultivars with various colored flowers, as well as a cross with a catalpa, called a chitalpa, which is a full-size tree with a rounded canopy but is less drought-tolerant.

*Provides an abundant nectar source for hummingbirds, butterflies, bees, bumblebees, and many other insect pollinators, and is a host plant for seraph moth (*Olceclostera seraphica*) and geometrid moth (*Eucaterva variaria*).*



Netleaf Hackberry

Scientific Name *Celtis reticulata*

Family Hemp, Cannabaceae

Plant Characteristics Deciduous shrub to 8 feet tall or small to medium tree reaching 20–30 feet tall with a rounded crown, nubby bark, sandpapery leaves; inconspicuous flowers produce pea-size, fleshy, sugary fruit especially important as winter food for birds. Deer- and rabbit-resistant.

USDA Hardiness Zones 4a–10b

Bloom Period Holds fruit from fall through winter.

Growing Conditions Full sun to partial shade and well-draining, occasionally moist soil.

Naturally occurring in the Southwest along permanent and periodic drainages, this large, drought- and heat-tolerant shrub easily grows into a small tree with sufficient water and judicious pruning, so choose its placement wisely. The gnarly bark, small leaves, and tiny fruit are moderately ornamental, while the tree is highly beneficial as a shady refuge for birds and butterflies, as a critical source of winter bird food, and as a host plant for butterfly larvae. Squirrels, foxes, and other mammals also eat the sweet drupes. The leaves often have tiny insect galls on the surface, which do no damage and are eaten by some birds. In dry summers, it appreciates a deep watering once or twice a month.

This larval host plant for mourning cloak (Nymphalis antiopa), American snout (Libytheana carinenta), and four emperor butterfly species (genus Asterocampa) provides food, shelter, and nesting sites for birds.



Smooth Sumac

Scientific Name *Rhus glabra*

Family Sumac, Anacardiaceae

Plant Characteristics Deciduous shrub or small tree 4–12 feet tall, rhizomatous, thicket-forming; attractive compound leaves have a reddish midrib with 13–31 lance-shaped leaflets that turn scarlet in the fall; large, dense, pyramidal clusters of small, creamy flowers on branch tips produce clusters of red drupes; male and female plants separate. Deer- and rabbit-resistant.

USDA Hardiness Zones 3a–9b

Bloom Period Summer (June–August); ornate fruits may overwinter

Growing Conditions Performs best in full sun, tolerates light shade; needs average to rich, well-draining soil.

If you have enough space and want to grace your garden with a highly ornamental small tree, the fast-growing, multistemmed sumac adds three-season color while fulfilling multiple wildlife needs. In the spring, its showy clusters of creamy white flowers attract numerous species of native bees and butterflies. During the hot summer, the leafy branches provide light shade and shelter for birds. Then, after a vivid display of scarlet fall leaf color, showy clusters of red drupes feed birds through the winter. Smooth sumacs are not demanding but do have several distinct qualities. They spread by rhizomes and form crowded shrubby to tree-size colonies, which can make an attractive addition, or become a nuisance, especially in loose, rich garden soil. Male plants produce both nectar and pollen and attract the most bees; females offer only nectar but provide seeds for birds. Several trees of each sex are required to insure the females set seeds. Smooth sumacs are well suited for poor soils, in naturalized areas where they can spread, as accents against border walls, or grouped in a landscape island.

Attracts many insects; a host plant for butterfly and moth species.



Autumn Sage



Fernbush

Shrubs



Pineapple Sage



Rubber Rabbitbush



Cliff Fendlerbush



Turpentine Bush

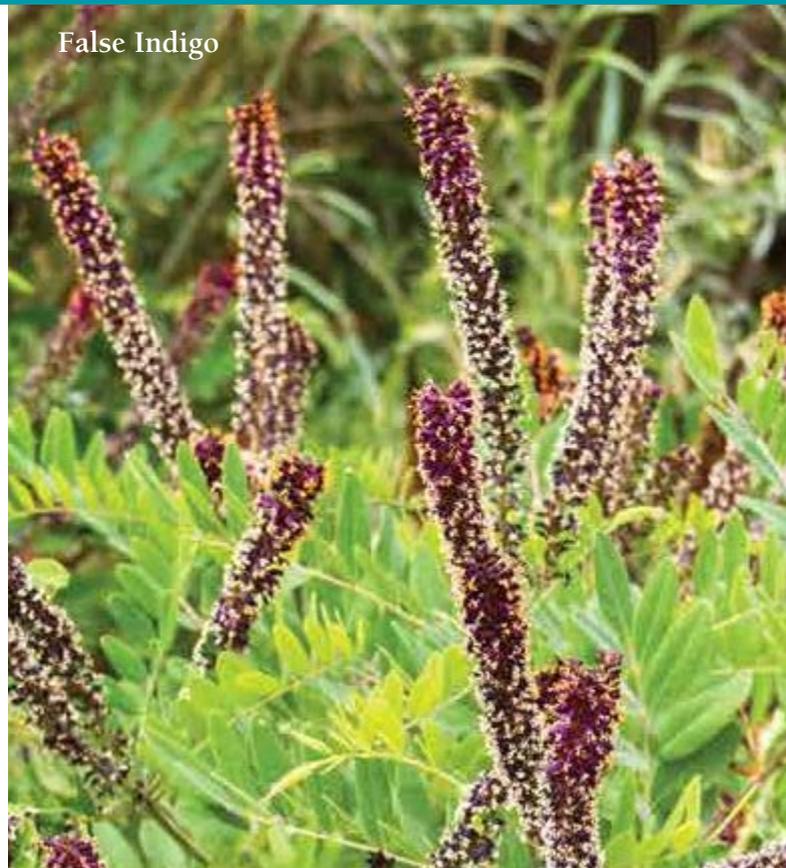


Pale Wolfberry



Hummingbird Trumpet

One of the dominant plant types of most desert ecosystems, shrubs should be a primary design element in your pollinator garden. Woody perennials, they burst into bloom when the soil warms early in the spring while herbaceous perennial wildflowers are just beginning to sprout from rootstock. Shrubs provide early-season pollen and nectar for emerging insects, host plants for butterfly and moth larvae, and shelter and fruit for birds. Their diverse features offer a great variety of landscape applications. As a bonus, many bloom off and on for three seasons, especially with periodic irrigation.



False Indigo



Brittlebush



Apache Plume

Scientific Name *Fallugia paradoxa*

Family Rose, Rosaceae

Plant Characteristics Upright woody shrub with multiple stems 2–4 feet tall and wide; small, semi-evergreen leaves are wedge-shaped, not showy; 1-inch-wide flowers have 5 white petals and showy yellow stamens, followed by pinkish, feathery seed plumes that cover the shrub. Deer- and rabbit-resistant.

USDA Hardiness Zones 4a–9b

Bloom Period Spring–fall (April–October)

Growing Conditions Performs best in full sun, tolerates dappled shade; needs sandy, gravelly, well-draining soil.

If you want an all-purpose, bulletproof shrub for your garden, this drought- and heat-tolerant pollinator pleaser should be on your list. A woody plant, its roots and branches are primed to start popping flowers soon after the last frost date, just in time to nourish emerging bees. It continues producing a blanket of flowers for pollinators and seeds for birds, especially goldfinches, all summer until the first frost. With ornamental flowers and feathery seed heads, this versatile plant makes an attractive three-season specimen plant for a landscape island or corner garden. Fast-growing, with dense foliage, it's also well suited for a backdrop, hedge, or screen planting. Apache plume naturally grows along intermittent drainages, so if the monsoon season fails, a monthly drink in dry summers prolongs blooming but probably won't be required with established plants. It's fast-growing from seed or pots and spreads by root shoots to form stands ideal for wildlife shelter. A winter trim maintains the desired size and stimulates blooming on the new growth. Every few years, you can cut it back severely as needed.

Highly attractive to butterflies, moths, bees, and other pollinators; larval host for Neumoegen's buckmoth (Hemileuca neumoegeni).



Retail Sources of Southwest Native Seeds & Plants

ARIZONA

Arizona Native Plant Society

www.aznps.com/native-landscaping-partners
(Online list of nurseries specializing in native plants)

NEW MEXICO

High Country Gardens

www.highcountrygardens.com
(Online only)
800-925-9387

Osuna Nursery and Garden Center

www.osunanursery.com/new-mexico-friendly
501 Osuna Road NE
Albuquerque, NM 87113
505-345-6644

Plants of the Southwest

www.plantsofthesouthwest.com
3095 Agua Fria St.
Santa Fe, NM 87505
505-438-8888
6680 Fourth St. NW
Albuquerque, NM 87107
800-788-7333

Santa Ana Garden Center

www.santaana.org/garden.htm
960 NM 550, Ste. C
Pueblo of Santa Ana, NM 87004
505-867-1322

TEXAS

Ladybird Johnson Wildflower Center

www.wildflower.org
(Gardens, annual plant sales, list of affiliated native plant suppliers)
4801 La Crosse Ave.
Austin, TX 78739
512-232-0101

Native Plant Societies

ARIZONA NATIVE PLANT SOCIETY

www.aznps.com

COLORADO NATIVE PLANT SOCIETY

www.conps.org

NATIVE PLANT SOCIETY OF NEW MEXICO

www.npsnm.org

NATIVE PLANT SOCIETY OF TEXAS

www.npsot.org

NEVADA NATIVE PLANT SOCIETY

www.nvnps.org

OKLAHOMA NATIVE PLANT SOCIETY

www.oknativeplants.org

UTAH NATIVE PLANT SOCIETY

www.unps.org



Botanical Gardens & Arboretums

ARIZONA

The Arboretum at Flagstaff

www.thearb.org
4001 S. Woody Mountain Rd.
Flagstaff, AZ 86005
928-774-1442

Arizona-Sonora Desert Museum

www.desertmuseum.org
2021 N. McKinney Rd.
Tucson, AZ 85743
520-883-2702

Arizona State University, Desert Arboretum Park

tours.asu.edu/tempe/desert-arboretum-park
556 S. Packard Dr.
Tempe, AZ 85281
480-268-4165

Boyce Thompson Arboretum

www.btarboretum.org
37615 E. Arboretum Way
Superior, AZ 85173
520-689-2723

Desert Botanical Garden

www.dbg.org
1201 N. Galvin Pkwy.
Phoenix, AZ 85008
480-941-1225

Tucson Botanical Gardens

www.tucsonbotanical.org
2150 N. Alvernon Way
Tucson, AZ 85712
520-326-9686

Tohono Chul Botanical Garden

www.tohonochul.org
7366 Paseo del Norte
Tucson, AZ 85704
520-742-6455

NEVADA

Springs Preserve

www.springspreserve.org/explore/botanical-garden.html
333 S. Valley View Blvd.
Las Vegas, NV 89107
702-822-7700

NEW MEXICO

ABQ BioPark Botanic Garden

www.abqbiopark.com
2601 Central Ave. NW
Albuquerque, NM 87104
505-768-2000

TEXAS

The University of Texas at El Paso, Centennial Museum & Chihuahuan Desert Gardens

www.utep.edu/centennial-museum
610 W. University Ave.
El Paso, TX 79968
915-747-5565

Chihuahuan Desert Nature Center & Botanical Gardens

www.cdri.org
43869 TX 118
Fort Davis, TX 79734
432-364-2499

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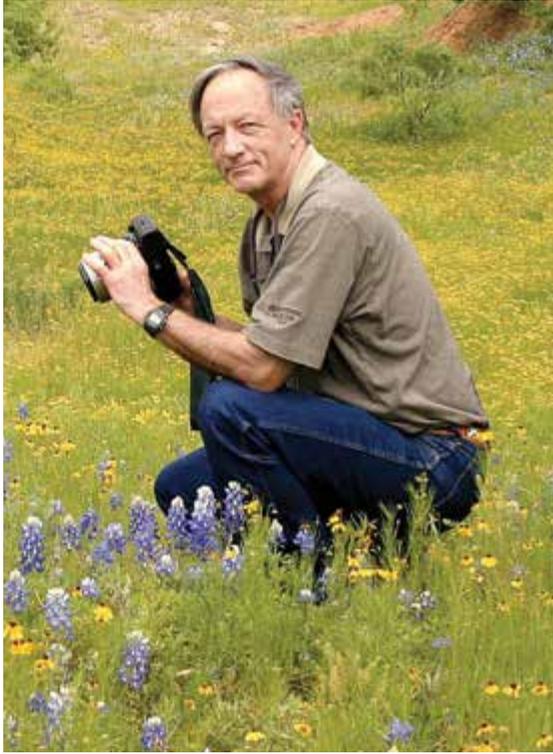
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About the Author



George Miller, a botanist and nature photographer, is a lifelong resident of the West. He has lived in New Mexico, Arizona, Texas, and California and is past president of the Albuquerque chapter of the Native Plant Society of New Mexico. He received a masters degree in zoology and botany from The University of Texas, Austin, and has written eight guidebooks to the Southwest, including the best seller *Landscaping with Native Plants of the Southwest*. George is also the author of seven Wildflower Quick Guides and a “Plant of the Month” column in *New Mexico Magazine*. His wildflower website (www.WildflowersNM.com) describes more than 600 species with photos and identification tips.

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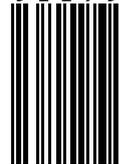
PUBLICATIONS
Adventure
an imprint of AdventureKEEN

GARDENING / REGIONAL / SOUTHWEST

ISBN 978-1-64755-039-4 \$22.95 U.S.



5 2 2 9 5



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