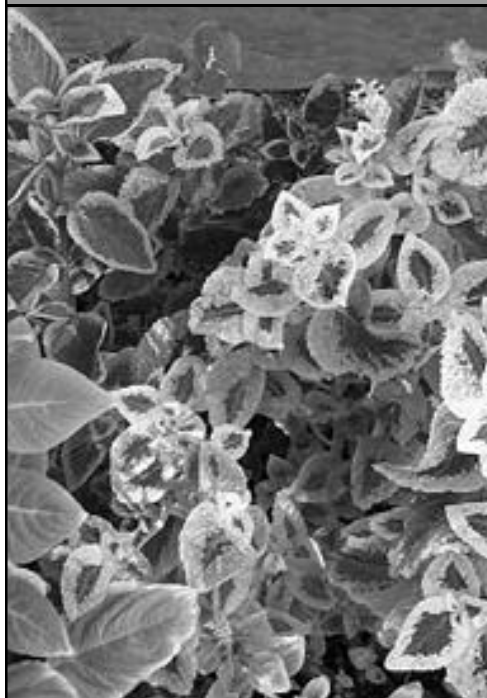


COOPERATIVE EXTENSION MARICOPA COUNTY

JOURNAL

HORTICULTURAL NEWS & RESEARCH • AUGUST/SEPTEMBER 2003



THE UNIVERSITY OF
ARIZONA[®]
COLLEGE OF AGRICULTURE
AND LIFE SCIENCES



INSIDE THIS ISSUE:

- 6** Confessions of an Egg Head

- 8** A Landscape Made for the Shade

- 12** Papaya: A Tantalizing Taste of the Tropics

- 16** The History of Bermuda Grass

- 18** Ironwood: Stately Sanctuary in the Sonoran



Master Gardener Journal

Spotlight on Our Partners: Interview with Christy Ten Eyck	3
Calendar of Events	4
Things to Expect & Do	5
Confessions of an Egg Head	6
Better Landscape Design: A Landscape Made for the Shade	8
Special Feature: Healing Through Horticulture	11
Computer Corner	11
A Bountiful Garden: Papaya, A Tantalizing Taste of the Tropics	12
Earth-Friendly Gardening • Ask a Gardener	15
Southwest Reprints: The History of Bermudagrass	16
Word Wise	17
Meet the Natives: The Ironwood, Stately Sanctuary in the Sonoran	18
Neophyte Nook: Soil Basics	21
Garden-Smart Tips	21
Worming Your Way to Fertile Ground	22

Maricopa County Master Gardeners: Cultivating Plants, People & Communities since 1980

Master Garden volunteers are trained by University of Arizona faculty and staff during a 17-week course. They provide educational leadership to the community with research-based horticulture knowledge. Volunteers promote efficient use of water, fertilizers, and pesticides, and preservation of our desert environment.

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13815 Camino del Sol Blvd., Sun City West, AZ 85375. Phone 623-546-1672. Hours: 9 a.m.-1 p.m. Monday-Friday.

East Valley Satellite location: East Mesa Multigenerational Center
7550 E. Adobe Rd., Mesa, AZ 85207. Phone 480-985-0338. Hours: 9 a.m.-noon, Mondays and Thursdays.

Northwest Valley Satellite location: Via Linda Senior Center
10440 E. Via Linda, Scottsdale, AZ 85258. Phone 480-312-5810. Hours: 9 a.m.-4 p.m., Tuesdays and Thursdays.

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Cover Photos: (clockwise from top left)
Coleus and Ironwood by Candice Sherrill,
Papaya by Dick Gross, Hen by Vicky Bundy.



Lucy Bradley, Extension Agent, Urban Horticulture

Photography: Donna Atwood

An Interview with Christy Ten Eyck

by *Nikol Price, Master Gardener*

Ten Eyck Landscape Architects Inc. is the talented design group that helped plan the Children's Environmental Education Garden at the County Extension offices in Phoenix. Christy Ten Eyck, along with talented landscape architect Mary Kenyon, donated their time and effort as part of Ten Eyck Landscape Architects' commitment to community involvement.

I recently had the opportunity to talk to Christy about her background and motivation.

How are you involved with youth gardening?

Our main role in (youth) gardening is with garden design. Ten Eyck Landscape Architects initially visited with Lucy Bradley to discuss the vision of the Children's Garden. After that meeting, we returned to the site and documented the existing conditions, drew a base plan, attended the initial brainstorming workshop, and then synthesized all the information into a physical site plan.

How long did you work on this project?

We had our initial meeting last summer, and produced our first plan last fall. Our involvement also included a recent revision to the original plan.

Are you a Master Gardener through the County Extension program?

Our office staff includes one person, Joanne Kasko, who is a Master Gardener through the County Extension program.

Do you regularly work with youth gardening in your career?

Ten Eyck Landscape Architects has worked on several project types that involve children, ranging from children's gardens to children's playgrounds and park facilities, to children's hospital courtyards. We believe in creating fun and exciting environments that interpret the desert landscape.

Were you interested in gardening as a child?

My early childhood memories are of my grandparents' huge vegetable garden in East Texas at their lake house. They grew Texas-size tomatoes, onions, figs, plums, etc. I remember my grandpa using fish innards as fertilizer in the garden, and it is still an indelible memory in my mind. At the time, I thought it was the most amazing, disgusting thing I had ever witnessed!

I also loved the oak-covered hill where their house was located. My grandparents put up swings for us, and we could see the lake in the distance as we swang. I can still hear my grandmother reciting the poem as we swang 'Up Up Up in a swing Up in the air so blue, Oh I do think it the pleasantest thing ever a child could do...Up in the air and over the wall 'till I can see so wide, rivers and trees and cattle and all over the countryside.'

I also have vivid memories of my other grandparents' fishpond, and the goldfish swimming around. I must have been really little—say 3—because they moved to another house when I was about this age.

What these experiences tell me is that:

- Kids like to grow things they can eat.
- Don't forget how kids like the 'yuck' factor—fascinating!



Courtesy Ten Eyck Landscape Architects Inc.

- It's a good idea for some recreational components to be mixed in when creating a garden.
- Kids are fascinated by water—it should have a place in the garden as long as it is safe.
- Kids love the animals and insects that are attracted to gardens.

Do you have any advice for people starting to work with youth gardens?

Have fun and never forget your ultimate client, the user, in this case the children. Don't over-hardscape!!

What is your favorite gardening book? Why is it your favorite?

A book we often refer to is *Earth Prayers*, edited by Elizabeth Roberts and Elias Amidon. It's a compilation of prayers, poems, meditations, and invocations honoring the earth. This book reminds us of the sacredness of the natural world, and of the interconnectedness of life.

Is there anything else you would like to share with readers?

We enjoyed helping the Maricopa County Extension office realize their dream of a children's garden, and are thankful for the opportunity. ■

Calendar of Events

AUGUST, 2003

8/2—**Guerrilla Herb Walk.** Saturday, 7:30 am to noon. Tucson Botanical Garden. Experience the oldest and original pharmacy — the one from the earth! Edible and medicinal usages, identification, preparations, cautions, and ecological status will be discussed as we walk through the upper Santa Catalinas. Bring a hat, water, snacks, and good walking/hiking shoes. Will carpool from a designated eastside location. \$22, \$20 TBG members

8/20 and 8/23—**Preparing and Planting a Winter Vegetable Garden.** Wednesday, August 20 from 9:00 am to 10:30 am, and again Saturday, August 23 from 1:00 pm to 2:30 pm. Tucson Botanical Garden. Greg Corman, horticulturist from Gardening Insights, Inc., will discuss soil preparation, planting, and organic care of lettuces, Asian greens, peas, carrots, and other varieties for planting in mid-September. \$12, \$10 TBG members

8/23 and 8/24—**Maximize your Flower Power.** Saturday and Sunday from 8:00 am to noon at Tucson Botanical Garden. Join artist/naturalist Doug Moore, author/illustrator of *The Nature of Madera Canyon*, for a weekend workshop closely observing and learning to create lifelike flowers in watercolor or color pencil. Class will include slide lecture, flower anatomy/morphology, and plenty of drawing time with one-on-one instruction. A materials list will be mailed prior to class. Limit 15 students. \$65, \$60 TBG members

8/27 thru 8/28—**10th Annual Maricopa County Summer Invasive Plant School.** Wednesday & Thursday,

9:00 am to 4:00 pm. 2-day intensified course will cover weed biology and ecology, invasive weeds of AZ, weed management, using herbicides, laws and regulations and environmental compliance. Price: Cost recovery fee to be determined.

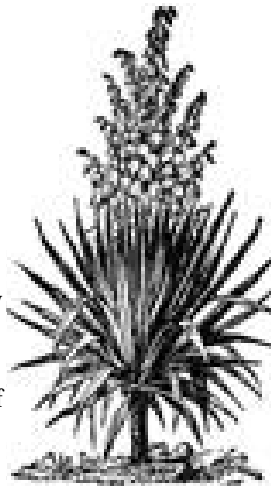
Registration required. Location: 4341 E. Broadway, Phoenix, AZ 85040. Contact: Kai Umeda or Pat Clay at kumeda@cals.arizona.edu. (602) 470-8086. www.cals.arizona.edu/crops.

8/27—**Drip Irrigation Basics.** Wednesday, 6:30 pm to 9:00 pm. Take the mystery out of watering your landscape. Learn to design and install a drip irrigation system that will be water efficient and low maintenance. Price: Free. Registration required. Location: Southeast Regional Library on Greenfield and Guadalupe Roads in Gilbert, AZ. Contact: Lisa Hemphill at lisahem@ci.gilbert.az.us. (480) 503-6878. <http://ci.gilbert.az.us/water>.

SEPTEMBER, 2003

9/4—**Create Your Own Oasis.** Thursday, 6:30 pm to 9:00 pm. Plan and design a colorful, water-efficient, lush landscape that will be maintenance free. You'll learn the plants and the techniques for success. Price: Free. Registration required. Location: Southeast Regional Library at Greenfield and Guadalupe Roads in Gilbert, AZ. Contact: Lisa Henphill at lisahem@ci.gilbert.az.us. (480) 503-6878. <http://ci.gilbert.az.us/water>.

9/4 and 9/6—**Butterfly Gardening and Identification.** Tucson Botanical Garden. Part I: Nectar Plants on Thursday, September 4 from 6:30 pm to



8:30 pm. Part II: Larval Food Plants on Saturday, September 6 from 9:00 am to 11:00 am. Learn how to attract a variety of fluttering beauties to your yard or patio. Two-part workshop taught by Master

Gardener and butterfly aficionado Karen Hillson. \$20, \$18 TBG members

9/6—**Basic Rose Gardening for Fall.** 1:00 pm to 4:00 pm. Let our master gardeners show you how to grow roses successfully in the desert. You'll learn planting, pruning, watering and fertilizing for fall. Price: 20.00. Registration required. Location: 4341 E. Broadway Road, Phoenix. Contact: Ainsley LaCour at ainsley@azorchids.com. (602) 470-8086. Sponsor: Cooperative Extension. <http://ag.arizona.edu/maricopa/garden/>.

9/10—**Pruning Basics.** Wednesday, 6:30 pm to 9:00 pm. Learn the what, when, why and how of pruning your plants to make them a beautiful addition to your landscape. Selecting, planting and staking will also be covered. Price: Free. Registration required. Location: Southeast Regional Library at Greenfield and Guadalupe Roads in Gilbert, AZ. Contact: Lisa Hemphill at lisahem@ci.gilbert.az.us. (480) 503-6878. www.ci.gilbert.az.us/water.

9/13—**Turf Care and Overseeding.** Saturday, 9:00 am to noon. Let our master gardeners show you how to select the best turf varieties. We'll divulge the best techniques for mowing, fertilizing, watering and overseeding. Price: 20.00. Registration required. Location: Cooperative Extension office, 4341 E. Broadway Road, Phoenix. Contact: Ainsley LaCour at ainsley@azorchids.com. (602) 470-8086.

<http://ag.arizona.edu/maricopa/garden/>.

9/13—Bye Bye Buzzards. Saturday from 7:00 am to 3:00 pm. Boyce Thompson Arboretum, 37615 Hwy 60, Superior, Arizona. Join us to bid adieu as the flock of turkey vultures prepare to migrate back to Mexico and parts south. We open one hour early so “early birds” may view the vultures as they sun themselves on Magma Ridge and wait for the warm air thermal currents to rise before a day spent searching for carrion. After vulture watching, join an escorted bird walk or see them up close — live vultures will be on hand, as well as other animals, birds, and reptiles that have been rescued and are being rehabilitated at the Adobe Mountain Wildlife Center. “Carrion Cake” and refreshments round out the celebration.

9/24—Irrigation Maintenance. Wednesday 6:30 pm to 9:00 pm. Learn to troubleshoot and repair drip, sprinkler and bubbler systems. Price: Free. Registration required. Location: Southeast Regional Library at Greenfield and Guadalupe Roads in Gilbert, AZ. Contact: Lisa Hemphill at lisahem@ci.gilbert.az.us. (480) 503-6098. www.ci.gilbert.az.us/water.

9/27—Tree Pruning & Care. Saturday, 9:00 am to noon. Let our master gardeners show you the ins and outs of selecting, planting, staking and maintaining a structurally beautiful addition to your landscape. Avoid the hazards associated with improper pruning practices. Price: 20.00. Registration required. Location: Cooperative Extension office, 4341 E. Broadway Road, Phoenix. Contact: Ainsley LaCour at ainsley@azorchids.com. (602) 470-8086. <http://ag.arizona.edu/maricopa/garden/>.

Things to Expect & Things to Do

by Terry H. Mikel, Extension Agent, Commercial Horticulture

CICADAS EMERGE and the males buzz to attract a female. Little damage is caused beyond the pricked bark on twigs, and no practical control is available.

ANTS AND TERMITES become more active and swarm during Arizona’s summer storm season. Until you’ve seen a mating swarm you haven’t lived.

ROOT ROTS are often the result of overly wet soils brought about by summer rains, coupled with over-watering. Let the soil breathe by drying out between long, deep soakings.

LAWN FUNGUS DISEASES INCREASE in warm, wet grass. Thick thatches and night watering increase fungus disease potential. Lawns stressed by too little water are prime candidates.

IRON CHLOROSIS can be induced with wet soils, keeping the oxygen levels low. Also, the wet conditions place the iron in a chemical that is less available for non-adapted plants. If the symptoms occur, and controlling water to dry the soil is difficult (e.g. lawns), use a chelated iron on plants (lawns also) with symptoms.

TOADSTOOLS AND SLIME FUNGI increase around the landscape with the warm wetness of the season. Though some may be edible, don’t chance it.

PALO VERDE BEETLES will continue to emerge from the ground under infested trees. Extra TLC remains the best treatment. Remember, Palo Verde Borers have been found on many other types of trees; especially (but not necessarily) ones with tap roots.

WATER CAREFULLY for better plant growth and to save water. The watering needs of plants increase with hot, dry weather. Be attentive to wilt symptoms. Water deeply, but only as often as necessary to maintain good growth. Remember the 1 - 2 - 3 rule.

FERTILIZE CITRUS in late August or early September to ensure good fruit sizing that will occur soon after. Tangelos are especially sensitive and respond best to this fall application.

MULCH SOIL SURFACES of trees (4 inches plus), shrubs (2-4 inches), and flower beds (1-2 inches) to keep root zones cooler and to minimize evaporation loss of water.

WATER, MOW AND FERTILIZE LAWNS ATTENTIVELY. Stress can quickly become a severe problem now. Late season blooming is common and increases with stress.

REPLENISH DEPLETED SOIL FERTILITY with a fertilizer application in August. Watering and rains leach away much of the soil’s nutrients, and they will be needed for the second flush of growth in late September.

TO DISTINGUISH ANTS FROM TERMITES, there are two things to look for: 1) ants have a tight constriction between the head/thorax and the abdomen, and 2) ant antennae bend to nearly 90 degrees about halfway out.

TRANSPLANT PALMS in the heat of summer for best results. ■

Confessions of an Egg Head

Many Americans view gardening catalogs as the herald of spring and new beginnings. They pour through these glossy publications during the cold winter months, weighing the value of new plant selections and deciding what their garden will require once spring arrives. Will my tomatoes get fusarium crown rot or curly top virus? What do you do about verticillium wilt? What can I grow in Zone 13?

In January when other people are thinking about frost protection and bare-root roses, I'm looking at the Murray McMurray Hatchery Catalog from Webster City, Iowa, the world's Rare Breed Poultry headquarters. Murray McMurray's is to chicken lovers what Burpee's is to garden enthusiasts. And I've got chicken fever.

THE OBSESSION BEGINS

I didn't always like chickens; my interest started a few years ago when we moved to Gilbert. "Let's get chickens," my husband Eric said one day. "They're easy to keep and they eat bugs. And there are the eggs. We'll get eggs."



"Will we get a rooster?" I asked.

"No, just hens," he said. "We only need a rooster for fertilized eggs and therefore chicks. Without a rooster, we'll get a dud egg, a blank. Let's start with hens."

Our neighborhood of 60 homes on irrigated acre lots is heavily populated with chickens, horses, sheep, and cows—and everyone has at least two dogs. Neighbors told us to see Marian,

assuring us that she had a few chickens to spare. Her house was set back from the road in a tangle of oleander and pine, but the front porch welcomed visitors with bright red geraniums, tomatoes in blue plastic pots, and trellises filled with climbing vines.

A plain, sturdy woman with arthritic hands and muddy shoes answered the door. She wore a red-plaid flannel shirt and eyeglasses from the 70s. Marian, I told myself, this has to be Marian.

After introductions were made, Eric got right down to business and asked if we could buy some chickens.

Harriet smiled—maybe even smirked.

How many times had she seen city-turned-country folk on her doorstep looking for chickens? "Sure," she said, "I've got some out back that I can part with. Meet me there."

We made our way around to the back and I looked through the chain link gate into

Harriet's backyard. It was a grassless moonscape of crude structures put together with wire and two-by-fours. Chickens of every size and shape were strolling around and pecking, or chasing one another, or sitting on the ground.

No boring white chickens here. They came in every imaginable shade of yellow, brown, black, white, and gold. There were short, fat chickens; tall, thin chickens; and chickens with feathers perpendicular to their bodies as if they'd been in a wind tunnel. There



were even chickens with no neck feathers at all. Some were small enough to hold in my hand if I could have caught them, while others were larger than a watermelon.

After a short but determined chase around the yard with a fishing net, we took three home in a paper feed bag: a black and orange Polish (Gertrude), a Rhode Island Red bantam (Harriet), and a Concorde-shaped black Cochin (Zola). Those girls were our first, but definitely not our last. Many others have graced our backyard over the years, before graduating to chicken heaven. We're down to just one now, a sexy Araucana crossbreed named "Bambi."

GREEN EGGS AND (NOT) HAM

Through Murray McMurray's website (www.mcmurrayhatchery.com), I learned that Araucana chickens get their name from an Indian tribe in Chile, and that they're also called the Easter Egg Chicken because of their ability to produce eggs that vary in color from turquoise to olive green. The color permeates right through the shell, unlike brown-shelled eggs where the coloring is just on the surface. Although Araucanas are my favorite, we've never had a purebred because they're expensive and difficult to breed.

Bambi is a crossbreed that exhibits some of the distinct Araucana features: nearly non-existent wattles (those flappy things that hang under their chin) and whiskers or tufts around her ears. Her whiskers make her look like a grinning Jack Nicholson as the Riddler in Batman. Here's a happy chicken, I think. She's got these whiskers and they're always curving up. She's smiling. Bambi isn't large, perhaps 5 pounds, and at first glance appears black, although in the sunlight her feathers are dark emerald green, the color of dark seawater.

Two weeks ago in late January, my husband sent me an email at work. Attached to it was the most wonderful photo in the world, one that made me smile. It showed an egg, a big beautiful sage green egg surrounded by a nest of mulched-up mulberry leaves. This was Bambi's first egg.

Today I decide to watch her lay an egg. I want to see this process. As I watch through the window, she approaches the planter where she usually deposits her eggs. New leaves have fallen into the planter, and she kicks a few away, moving slowly. She doesn't seem to have much patience for this today and she soon strolls away.

After a few minutes, she comes back and resumes the leaf kicking, exposing her nest, which is lined with fluffy feathers. She sits at a 45-degree angle to the wall with her rump facing outward, her tail higher than her head. She gets up again, turns in a clockwise circle, pecks at the leaves, and settles down again. She rearranges the grass, and daintily nibbles at microscopic bugs. I can see her tail moving slowly

up and down. She looks around, blinks her eyes, and shifts her head. Her tail rocks gently back and forth, up and down, but it is the only thing that's moving. This takes a long time.

Suddenly she cranes her neck, her tail begins jerking more quickly, moving lower than before. I am afraid to move, afraid that she'll see me through the window, afraid somehow that I'll disturb her. Her tail dips lower and quivers. She elevates herself to a low crouch. Her tail dips three times and the egg falls. She raises her body and looks around. I can see the egg, even though she is standing over it. She looks dazed. Although it seemed longer, the whole process has taken only twenty-five minutes.

Looking more alert now, Bambi leaves her nest and tiptoes across the patio, stretching her feet. She saunters toward the bird feeder where gray mourning doves are eating cracked corn from the ground. Halfway there she breaks into a run, intent on scaring the other birds away. She streaks over to the spot, her round body rolling from side to side, her head low, a bullet of black feathers. The birds scatter quickly, leaving her to peck at the corn idly for a few minutes. Finally she heads off to the underbrush of blackberries, looking for bugs.

I go outside to her nest and pick up the heavy gray-green perfect egg, still warm from her body. It's not exactly smooth, but has tiny fissures that remind me of the moon seen through a telescope. I cradle the egg gently, carry it into the house, write the date on the narrow, and gently place it in the refrigerator with the others. Yes indeed, I tell myself, our Bambi is one hot chick. ■

BUTTERFLIES AT BOYCE

If cooler temperatures aren't enough reason to drive north to Boyce Thompson Arboretum during the hot summer months, the butterflies may tempt you. If you stroll the trails at this time of year, you're likely to see recently hatched Queens, Cabbage Whites and Pipevine Swallowtails.

Gardeners wishing to attract these colorful species to their backyards can take home "Desert Butterfly Gardening," a 32-page booklet listing dozens of species of plants and the butterflies that depend upon them for food and habitat. This \$2.25 booklet is packed with colorful photos to help you learn to distinguish a Pipevine Swallowtail from a Southern Dogface, as well as landscaping advice and schematics explaining how to plant your yard to attract these colorful visitors. Come see mature varieties of these plants at the Arboretum's beautiful Hummingbird-Butterfly Garden, and bring home a copy of this excellent primer to help start your own collection.

Arboretum admission is \$6 for adults, \$3 for ages 5-12. For details, call 520-689-2811 or visit their website at <http://arboretum.ag.arizona.edu>. ■



Illustration: Donna Atwood

A Landscape Made for the Shade

Every landscape should feature a shady retreat. What better way to spend a lazy weekend afternoon than swaying in a hammock under the shade of the backyard palo verde, frosty glass of lemonade in hand? Shade is a much-appreciated commodity here in the desert, especially during our grueling summer months. A shady spot has a special charm, providing a relaxing refuge protected from the sun's glare. You can make your yard more livable by enhancing or modifying the shady areas in your garden or by creating new shade.

When designing for shade it is important to become familiar with the shade

pattern in your landscape. This pattern is influenced by the sun's path and by plantings and structures in your yard as well as that of your neighbors. It affects the capacity of sunlight to reach your garden and changes throughout the day as the sun crosses the sky.

Shade patterns also vary seasonally. The angle of the sun in relationship to the earth changes as the earth rotates on its axis, affecting the amount, intensity, and orientation of



sunlight your garden receives. The position of the sun is at its highest point in the sky during the summer, resulting in higher temperatures, more direct light and longer daylight hours. During the winter the angle of the sun is lower; the temperature is cooler, sunlight becomes

less intense, and days are shorter.

Analyze the shade pattern and the types of shade in your landscape. In a gardener's world not all shade is alike.

DEEP OR FULL SHADE indicates that there is no direct sunlight. Spaces under the canopy of a dense tree, a roof, or an overhang are the most difficult areas to find suitable plants for. A specimen planted in these conditions must be able to thrive without any direct sun, yet withstand high temperatures.

OPEN SHADE denotes areas that are open to the sky but do not receive any direct sun. An example of this type of shade would be a location shaded by a tall building or wall.

PARTIAL SHADE describes a location that receives five hours or less of direct sunshine during the day. Plants located along an east-facing wall or on the east side of taller plants receive morning sun only, and experience cooler temperatures earlier in the day. Vegetation along a west-facing structure will get the more intense sunlight of the afternoon hours.



Photography: Candice Sherrill

FILTERED OR DAPPLED SHADE is found under open-branched trees or lathes. Such areas may be relatively bright, without receiving any direct sun.

As you monitor the fluctuations in your yard's shade pattern, you might notice that a spot adjacent to the north-facing wall is in open shade during the winter months, yet receives direct sunlight in the late afternoon hours during the summer if the area to the west of it is unobstructed. The area under a shade tree may not receive direct sun during the summer, but may get more light in the winter when the sun's rays are lower in the sky and reach under the branches. Shade gardening can be complex; it is an ever-changing phenomenon.

Now that you have some idea of how shadows in various areas of your landscape vary, think about how these areas function. Are parts of your landscape used for dining, entertaining or recreation? Is there too much shade, or not enough? While there is little you can do about the shade cast by your house or your neighbors, other structures in your yard can be eliminated to lessen shady corners, or built to add instant shade. Plants can be added, removed, or pruned to achieve the same results.

CREATING SHADE WITH PLANTS AND HARDSCAPE

If lack of shade is a problem, use plants and structure to create it. Strategically placed trees and shrubs can do wonders to block the sun's glare from your favorite sitting area. An overhead arbor, a vine-covered trellis, and decorative walls or fences of varying heights can make a patio or dining space more livable.

As a bonus, the plants and hardscape you incorporate into your landscape to generate shade can be save energy costs by shading the interior of your home. Study the orientation of the sun in relationship to your house, and place the plant where the shade will be most effective indoors and out.

MODIFYING OR ELIMINATING SHADE

As wonderful as shade is, it could become too much of a good thing. If the shade in your garden is not in an appropriate spot, or that shady corner is a little too gloomy, don't hesitate to make some adjustments. Move the trellis; pull out the offending shrub; tear down that wall that serves no purpose; or thin out or remove the lower branches of the tree to allow in more light. (Consider calling in an arborist if a pruning job is too much to handle.)

AVOIDING PROBLEMS IN SHADY SITUATIONS

Keep in mind the problems that can occur in shady conditions. Plants growing under or in the vicinity of trees compete for water and nutrients. Keep an eye on moisture and signs of nutrient deficiencies and adjust irrigation and fertilization accordingly.

The ground in shady areas may stay wetter longer because of the lack of sunlight. Air circulation is often obstructed by the structures and plant material that created the shade. Plants diseases may take hold more readily under these conditions. Make certain the ground dries out between irrigations, and do not group plants together too closely. Drip irrigation or soaker hoses are ideal for these situations



because you avoid wetting the plant foliage. Make sure to promptly remove plant debris to minimize problems.

USING COLOR IN THE SHADE

Light and bright colors transform a shady corner. Use plants with white flowers for a sparkling effect. Pastel yellow, pink and other light colors shimmer, while bright yellows, oranges and reds glow in the dim light. Avoid deeper blues and purples, which tend to visually recede. Foliage with lighter green tones, variegated leaves, or silvery foliage is also a good choice.

Painting walls, fences, and other hardscape elements with light colors can help reflect sunlight and can add brightness if needed.

CHOOSING PLANTS

Finding plants to fit your particular shady situation can be tricky. The plants you choose must tolerate low or fluctuating light conditions yet survive the summer heat. The following list is only a starting point. All of these plants will tolerate some degree of shade. Study the light and moisture requirements of these plants, and match them to your individual shade conditions. Be prepared to experiment...it may take some trial and error to find the perfect specimen for that special location.

Trees:

- Arbutus unedo* (Strawberry Tree)
- Ficus benjamina* (Weeping Fig)
- Ficus nitida* (Indian Laurel Fig)
- Laurus nobilis* (Sweet Bay)
- Prunus caroliniana* (Carolina Cherry)

Palms:

Butia capitata (Pindo Palm)
Cycas revoluta (Sago Palm)
Phoenix roebelenii (Pygmy Date Palm)
Trachycarpus fortunei (Windmill Palm)

Large shrubs:

Acanthus mollis (Bears Breech)
Aucuba japonica (Japanese Aucuba)
Cocculus laurifolius
Euphorbia pulcherrima (Poinsettia)
Gardenia jasminoides (Cape Jasmine)
Justicia ovata (Red Firecracker)
Leucophyllum laevigatum
 (Chihuahuan Sage)
Leucophyllum langmaniae (Rio Bravo™)
Leucophyllum prunosum
 (Sierra Bouquet™)
Leucophyllum zygophyllum (Blue Sage)
Nandina domestica (Heavenly Bamboo)
Pittosporum tobira
Portulacaria afra (Elephant's Food)
Simmondsia chinensis (Jojoba)
Tecomaria capensis (Cape Honeysuckle)
Viburnum suspensum
Viburnum tinus
Xylosma congestum

Small Shrubs:

Agapanthus (Lily-Of-The-Nile)
Anisacanthus (Desert Honeysuckle)
Euonymus japonica
 (Box-Leafed Euonymus)
Ilex cornuta (Chinese Holly)

Justicia candidans
 (Red Justicia)
Justicia spicigera
 (Mexican Honeysuckle)
Salvia leucantha
 (Mexican Blue Sage)

Pittosporum tobira (Wheeler's Dwarf)
Plumbago scandens
Raphiolepis indica (Indian Hawthorn)

Ground Covers:

Asparagus densiflorus
 (Sprengrer Asparagus)
Aptenia cordifolia (Hearts and Flowers)
Dalea greggii (Trailing Indigo Bush)
Oenothera sp.
Verbena peruviana
Vinca major
Wedelia trilobata

Vines:

Clematis drummondii (Old Man's Beard)
Cissus trifoliata (Arizona Grape Ivy)
Ficus pumila (Creeping Fig)
Gelsemium sempervirens
 (Carolina Jessamine)
Hedera canariensis (Algerian Ivy)
Hedera helix (English Ivy)
Trachelospermum jasminoides
 (Star Jasmine)

Accents:

Agave geminiflora
 (Twin-Flowered Agave)
Agave parryi (Parry's Agave)
Agave vilmoriniana (Octopus Agave)
Aloe sp.
Cephalocereus senilis (Old Man Cactus)
Dasyliirion acrotriche
 (Green Desert Spoon)
Dasyliirion longissima (Toothless Sotol)
Haworthia sp.
Muhlenbergia sp.
Yucca gloriosa (Spanish Dagger)

Perennials:

Aquilegia chrysantha
 (Golden Columbine)
Cuphea llavea (Bat-Faced Cuphea)
Dicliptera suberecta (Velvet



Honeysuckle)
Diets iridioides (Fortnight Lily)
Hesperaloe parviflora (Red Yucca)
Monarda (Bee Balm)
Penstemon sp.
Rosa banksiae
 (Lady Banks Rose)
Salvia greggii (Autumn Sage)

Tulbaghia violacea (Society Garlic)
Zantedeschia (Calla Lily)
Zephyranthes (Rain Lily)

Annuals & Plants Grown as Annuals:

Ageratum houstonianum (Ageratum)
Begonia (Begonia)
Bellis perennis (English Daisy)
Chrysanthemum maximum
 (Shasta Daisy)
Coleus (Coleus)
Dahlia
Dianthus barbatus (Sweet William)
Iberis (Candytuft)
Impatiens wallerana (Impatiens)
Lobelia erinus (Lobelia)
Lobularia maritima (Sweet Alyssum)
Pentas lanceolata (Star Clusters)
Petunia (Petunia)
Viola (Pansies)

Make your shady haven a cozy place to unwind. Design the space with relaxation in mind. Comfy patio furniture, a glider, or hammock can determine if the space will actually be used. A small accent table may come in handy as a resting place for a cold drink or an impromptu game of checkers. Consider making use of container plants; they are versatile in shady conditions because they are easily moved as the seasons and the shade pattern changes. A gazing globe or other whimsical accent can add some charm to the setting. Be resourceful and create a work of art yourself! Accessories for your shade garden need not cost a fortune.

Observe your shade patterns, do a little research, create a well thought-out design ...and you'll enjoy a landscape made for the shade! ■



Photography: Candice Sherrill

Healing Through Horticulture

by *Diane Ashcroft*,
Master Gardener Intern

Gardens grant us the power to heal the mental and physical pain in our lives. Just as our ancestors understood at a deep level their dependence on the natural world and its healing plants, we are coming to a renewed understanding of gardening as a healing agent in our complex technological society. Horticultural therapy, the combination of scientific therapeutics and gardening, is helping people participate actively in their healing process by getting their hands dirty.

Horticultural Therapy is really an old idea, going back as far as ancient Egypt where health practitioners often prescribed outdoor walks and breathing fresh air to their ailing patients. During the Middle Ages monks grew healing herbs and provided outdoor spaces affording quiet contemplation and safety for the ill. Friends Hospital was built in the 1800's on a 57-acre farm near Philadelphia to properly care for the mentally ill. Florence Nightingale strongly encouraged hospitals to provide light, air, and gardens for the sick.

In "The Healing Power of Gardens," author Anne Raver states, "When the ancients were sick, they walked among trees and plants and breathed fresh air to soothe their pain. Then came the discovery of penicillin, chemotherapy and laser beams. High-tech medicine buried the garden under high-rise hospitals with sealed windows. But now there's a movement afoot to return nature to the lives of patients."

Since 1972, the American Horticulture Therapy Association has been at the forefront of developing and maintaining this practice. They have been instrumental in setting up gardens in nursing homes, hospitals, vocational schools, and prisons. An article in American Nurseryman defines horticultural therapy as, "A treatment plan focused on horticulture or gardening activities. It needs a client (patient) with a diagnosed problem and a treatment plan that can be measured and evaluated. Also needed are qualified professionals to deliver the treatment."

Pushing and pulling are repetitious and FUN exercises when done in a garden rather than inside a gym on a machine. Writer Patricia Owens, in "Developmental Disabilities," points out that increased self-esteem; nurturing; connecting; relaxing; and the jogging of old memories by familiar sights, smells, and textures are further benefits of a horticulture therapy program.

Today, healthcare professionals throughout the world are helping their patients help themselves...by digging in the dirt. While cultivating their external gardens, they also heal their internal gardens. ■

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- Owens, Patricia. "Developmental Disabilities." Crain's Cleveland Business. 12/03/01.
Raver, Anne. "Healing Power of Gardens." Saturday Evening Post. Mar/Apr, 1995.
Warner, Charles Dudley. "My Summer In a Garden." 1870. American Nurseryman. 12/15/99.

Computer Corner

by *Candice Sherrill*,
Master Gardener

RECIPES

If you're looking for new recipes to showcase the tasty fruits and veggies you've been growing, the Valley's own Mad Coyote Joe has archived recipes from his popular weekly television show, The Sonoran Grill, at this site. You'll find hundreds of dishes listed here, from A as in Artichoke Spread to Z as in Sautéed Red Potatoes with Baby Zucchini. <http://www.sonorangrill.com/>

PLANT IMAGES

Do you know what an Adder's Tongue looks like? What about *Achyranthes splendens*? Now you can find out by visiting the National Museum of Natural History's web page. Here, you'll find photographs and botanical prints of many of the world's plants. The images are copyrighted, but may be reproduced for non-commercial, scientific, educational, and personal use. <http://www.nmnh.si.edu/botany/images.htm>

FOR BOTANY BRAINIACS

Here's a worldwide list of botany-related Usenet Newsgroups. A Usenet Newsgroup (for the uninitiated) is a specialized electronic communications forum. Most if not all of these groups are limited to use by researchers, but the general public can "listen in" on discussions if they wish to sign up. <http://www.ou.edu/cas/botany-micro/iasprt/usenet.shtml>

CONGRESSIONAL ACTIVITY

Visit Thomas (as in Jefferson), to browse through, read, and keep track of Federal legislation as it passes through Congress. This searchable database is made possible through the Library of Congress. http://thomas.loc.gov/home/abt_thom.html ■

Papaya: A Tantalizing Taste of the Tropics

BOTANICAL NAME:

Carica papaya Linnaeus

FAMILY:

Caricaceae

Technically, the papaya is not a tree but an herbaceous succulent. Succulent plants that possess self-supporting stems (such as the papaya and banana) are known as herbs.

Papayas grow best in tropical and subtropical climates, where annual temperatures stay between 70 and 80 degrees Fahrenheit and annual rainfall is well over 40 inches. The papaya is a relatively short-lived plant in even the most favorable environment, and rarely exceeds 4 years here in the Salt River Basin where its demise is almost always caused by root rot. Still, papayas can be grown successfully here in the desert, where 7 inches of annual rainfall are

common and temperatures range from 32 to 120 degrees. One just needs to practice careful irrigation and know how to cope with an occasional frost.

A papaya plant blooms continuously throughout its adult life. A seedling 8 inches tall planted in Phoenix about the first of March will typically grow to a height of 4 to 5 feet by the first of May, with blossoms forming in the leaf axils (that upper space between the leaf and stem). By October it can exceed 7 or 8 feet, and have mature fruit if germination has occurred.

COLD WEATHER PROTECTION

A typical cold snap in Phoenix and the surrounding valley is generally of short duration, occurring between 5:00 am and 7:00 am. I've lived on the West Side for 29 years, and I've experienced one low of 15 degrees Fahrenheit, and several in the range of 29 to 32 degrees.

Brief lows in those ranges are not enough to hurt a relatively dry root system, so don't worry about protection. A sustained low of 33 to 34 degrees, however, will damage foliage. The leaves and crown (growing tip) are quite sensitive, and a mild frost will kill them. The stem of the papaya plant is frost-tender, but I have never seen one damaged by frost.

There is one important thing to keep in mind where frost protection is concerned: NEVER FLOOD THE TREE BASIN, as is often advised for the protection of citrus. The soggy soil will cause root rot, and the tree may be dead before the ground dries.

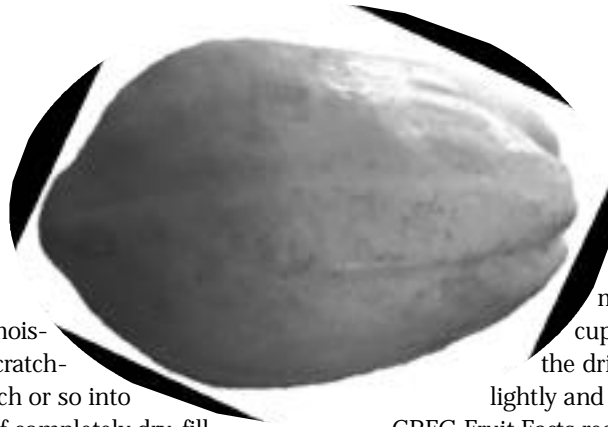
If frost protection becomes necessary, you can wrap the plant with burlap or blankets. Commercial frost covers are available, but they don't offer enough protection for a long exposure. If a prolonged frost is predicted, you can drive a stake under the cover several inches from the stem and attach a 25-watt light bulb using an extension cord. (Make sure the bulb has a safety shield, and remember that electrical devices should never be used in wet weather). For trees over 13 feet tall, you can try mounting a 100-watt flood lamp or an infrared light under the tree canopy and forget about using frost cover (unless you can handle yourself on 6-foot stilts).

One effective way to protect foliage is to aim an air fan into the leaf mass. Use the highest-output shop fan you can find. This will protect your papaya in all but a severe freeze of long duration, and even then the fan will minimize frost damage. If you are blessed with several papaya plants or other tender subtropical fruit trees, get several fans.

If you should end up losing all the foliage and growing tip to frost damage or crown rot, don't despair. A healthy root system kept dry in cold weather will force branching, and each branch will have the potential to bear fruit. Some cultures behead their papayas on purpose to increase production.



Photography: Dick Gross



IRRIGATION

Growers have observed that the papaya will handle all the water you can give it. That is true only during the summer, where drainage is ideal and soil temperature is above 70 degrees Fahrenheit. Root rot is certain to set in whenever the soil is cold and damp for more than a few days at a time, and it is always fatal.

There isn't much you can do about extended rain, except to plant on a slight mound to direct water away from the root zone. Since the leaves form a natural umbrella that deflects rain toward the drip line, you can cover the area beneath the tree with plastic when rain is anticipated. But be sure to remove it when the sun comes out again. Once wet, shallow cultivation, using care to avoid wounding roots near the surface at the stem, can help aerate and dry out the soil.

In the months of November through February, when ambient air temperatures are in the 40s and soil temperature is below 60 degrees, papaya growth is very slow—virtually at a standstill. The method of irrigation at this time is critical. Water modestly only at the drip line and only when the soil there is dry to a depth of one inch. Once established, the papaya has a much greater tolerance to drought than to cold, wet feet.

For winter irrigation dig a 3-inch-deep trench the width and shape of a garden spade around the tree, like the imprint of a doughnut, with the inner ring directly beneath the drip line. The trench itself should lie outside the drip line. As the plant grows, extend the trench outward to keep up with it.

Check ground moisture by scratching an inch or so into the soil. If completely dry, fill the trench with a garden hose at the rate of about a half-gallon per minute. When full, stop. Don't water again until you scratch the soil and find it quite dry.

The papaya will take full Arizona sun. If the soil temperature is above 55 degrees and drains well (the basin will empty in less than 30 minutes), it is okay to flood irrigate. The tree will respond with very rapid growth. When the temperature rises over 90, use good judgment but water often and deeply.

FERTILIZATION

The requirements are not well established in this area. I have raised more than 20 plants to maturity, some with erratic fertilizing and others with no fertilizer, just water. If there was a difference, I failed to detect it then. Having learned, however, that papayas do indeed respond to nitrogen, I presently feed as follows:

With seedlings until transplanted into 1-gallon containers, use 1/4 teaspoon per gallon of water-soluble fertilizer with every watering.

With plants in 1-gallon containers, drench already-moist soil every 2 weeks with about 1 quart of water mixed at the rate of 1 tablespoon per gallon of 20-20-20. Any commercially available soluble fertilizer is okay. I've found slow-release plant food to be satisfactory and easiest to apply.

For established plants in the ground, salt about a cup of ammonium sulfate

monthly (or 1/4 cup weekly) around the drip line. Rake it in lightly and water well.

CRFG Fruit Facts recommends 1/4 pound of 21-0-0 monthly, increasing to 1/2 pound per month after the plant is established. Do not add fertilizer to cold, wet soil.

VARIETIES

The Mexican papaya appears to be easily grown in the Phoenix area. The fruit—at least that with which I am familiar—is the size of small watermelons. I have not tried to grow it because I don't like the taste. Grocery store papayas are generally a Hawaiian-grown Solo variety. The common cultivars of the Solo are Sunrise, Sunset, Vista, Waimanolo and X-77 (Kaymia). These vary in disease resistance, size, shape, color of the fruit, and size of the tree. None of these varietal differences are of any particular value to the recreational home grower in the Phoenix area.

POLLINATION

Your tree may be male, female or hermaphroditic. You won't know until it blooms. Even then it may take some conjecture until the fruit actually sets.

There is no mistaking the male. It has clusters of small white blossoms borne on branched tentacles that may be more than 18 inches long.

The female has a slightly larger single white blossom borne on the head of a miniature fruit close to the stem in a leaf axil. The petals tend to be straight. If the fruit shrivels after the bloom dies, it has not been pollinated.

— continued page 14

The hermaphrodite, difficult for the inexperienced to distinguish from the female, has all the necessary sexual paraphernalia in its blossoms to develop fruit. The white petals on this flower have a slight right-hand twist that is easier to observe while the blossom is still closed. It is best to plant several seeds or seedlings to improve the odds for getting the sex you want. They can be thinned out later.

PLANTING THE SEED

Scoop the seed from the papaya. The seeds are encased in a gelatinous envelope. I find it best to break it apart and wash the seeds thoroughly and then air-dry. I usually soak the seeds overnight, and then mix them (they may number up to 400) with a handful of peat moss. Spread the mix evenly over a tray containing 3-4 inches of a good planting mix. Cover that with 1/2 inch of the same mix. Cover with plastic wrap until they break the surface, keeping the medium damp but not wet. Sprouting can take from 15 days to 6 weeks or longer for some inexplicable reason. Bottom heat always helps. As



soon as the sprouts break the surface, start getting them into bright light to harden them off. Insufficient light will make them leggy. Prick the seedlings out when they are about 2 inches tall and transplant into 4-inch containers in a potting soil that drains well. You will lose a few to damping off, but don't let that concern you. You will have planted a hundred seeds, and you

only need 2 or 3 trees. Don't plant in the ground until the soil temperature is at least 55 degrees Fahrenheit—70 degrees is even better.

Resources: Internet sources for this material include CRFG Fruit Facts, the University of Hawaii, Texas A & M, and the University of Florida, with input from members of the Arizona Rare Fruit Growers. In large part, the information is based upon my own experience. I am still learning, still experimenting. What I believe today to be the facts may turn out to be fallacy tomorrow. ■



PAPAYA RECIPES

PAPAYA ICE CREAM

- 1 ripe papaya, peeled, seeded and sliced
- 1 tablespoon lemon juice
- 3/4 cup sugar
- 2 eggs, beaten
- 1 cup milk
- 1 cup half & half or whipping cream

In a blender or food processor fitted with metal blade, puree papaya and lemon juice. In a medium saucepan combine sugar, beaten eggs and milk. Cook and stir over low heat until the mixture thickens and coats a spoon. Add papaya and half and half. Pour into ice cream canister. Freeze in ice cream maker according to manufacturer's directions.

Makes 1 quart

PAPAYA SMOOTHIE

- 1 ripe papaya, peeled, seeded and sliced
- 1/4 cup orange juice
- 1/4 cup frozen vanilla yogurt

Blend all ingredients in a blender or food processor until smooth.

Makes 1 serving



Illustration/Photograph: Art Today

Free Water for Your Garden

by Jo Miller, Water Conservation Coordinator, City of Glendale

The monsoon season is upon us, and with a little luck we will get some rain. Instead of letting rainwater run down the streets, you may want to consider harvesting it to help water your landscape. Rainwater harvesting involves taking action to preserve and use the rainwater on your property. Typically, rainwater is harvested in two ways:

By collecting and storing from gutters into containers such as barrels and tanks. Make sure they are sealed or use mosquito dunks to control mosquitoes.

By encouraging water to soak in and be stored in the soil by constructing earthworks such as basins, depressions, berms, or on-contour trenches (called swales). Water should soak in within one day.

The following lists some of the many advantages of using rainwater in your landscape:

- Rainwater is better for most plants.
- Less rainwater is lost to evaporation if allowed to absorb in the soil. Deeper water penetration encourages worms and other organisms, making soil healthier.
- Rainwater increases the efficiency of drip systems through supplementation.
- Reduction of storm water runoff and non-point source pollution.
- Reduction of landscape erosion/flooding.
- Rainwater is free and does not strain community resources.

To assess your potential for harvesting water, it is helpful to spend some time outside observing what happens after a rain. In a one-inch rain event, the average house can shed well over 1000 gallons of water off the roof. Where is this water going? Drawing a map of your property will help you determine where you have the potential for collecting water on your property. Your map should include the following:

- Indicate with arrows the pitch of the roof and flow of water from the roof.
- Indicate the high and low point of your property.
- Make note of any areas where water flows on or near your property from an outside source.
- Mark any low spots where water tends to accumulate.
- Indicate the direction and approximate degree of slopes.

Once you have observed the flow of water on your property, you are ready to start with some simple harvesting techniques. Small earthworks such as berms or basins may be the easiest place to start.

Note: Water harvested from shingle, tar, or asphalt roofs is not recommended for use on edible plants. ■



Ask a Gardener

by Judy Curtis, Master Gardener

Mystery Plant

Question: Recently, a plant I don't recognize appeared in my yard. It is fast growing, tall and spindly, with thick blue-green leaves and yellow tubular flowers. What could it be?

When this plant first appeared in my garden years ago, I thought it was a stray cabbage or cauliflower. I learned that it was tree tobacco or *Nicotiana glauca*, native to Argentina and Bolivia. It has spread into most of the Southwest and is considered invasive in some areas.

While it is in the tobacco family and has been used ritually by native tribes, it does not have much nicotine in it. The best reason to keep it in the landscape is that hummingbirds love it. It is also fast growing. I have used it near a new tree to give height until



the tree grew taller. It dies back in the winter and can be cut to the ground. It will recover quickly in the spring.

This said, one must decide if the advantages outweigh the problems with tree tobacco. All parts of the plant are toxic if ingested, and it can become a pest if there is adequate water. I allow one or two to grow each year for the birds, but if you have young children you might choose not to keep it around. ■

The History of Bermudagrass

By David M. Kopec, Ph.D., Desert Turf Specialist, University of Arizona

Bermudagrass is most likely the toughest grass used for turf in areas of the desert southwest, the southern plains, and the humid southeastern United States. No other warm season grass has so many attributes. These include:

- Excellent resistance to heat and drought
- Low water use rate
- Dense sod formation
- Tolerance of a wide range of soil pH ranges
- Good tolerance to salty water and conditions
- Good traffic tolerance
- Relative ease of establishment
- Grows on hard soil surfaces and shallow soils, better than most other grasses

Because bermudagrass has specialized growth stems and a relatively rapid growth rate, it is usually excellent at crowding out weeds. This is the primary reason why bermuda grows back so well when it is injured. Underground shoots (called rhizomes) help bermudagrass fill in void spots in a lawn. Aboveground runners (stolons), similar to those on strawberry plants, also serve the same function. While these properties are highly beneficial, they are often disdained as making bermudagrass an “invasive weed” where it is not wanted.

Where did bermudagrass come from? Like almost all of our turfgrass species, bermudagrass was introduced to the United States. The origin of the first introduction of bermudagrass most

likely came from contaminated hay, which was used as bedding when slaves were brought to America. Millions and millions of seeds were distributed initially across the eastern United States. Surviving plants then were able to make more seeds and so on.

Bermudagrass plants were then used exclusively for forage purposes for hundreds of years and no doubt also as a lawn grass by default, even though seed was sold mostly for forage. Bermudagrass was used in the southern United States in the early 1900’s as a golf course turf, and was used as an “alternative” for sand greens that were exactly that—a putting surface comprised of sand with no grass! Over time (many decades), lower growing types of “common bermudagrass” began to show up on seeded bermudagrass greens. Greenskeepers and a few scientists treated these findings with curiosity. In the 1940’s, one such plant was collected from a golf course in Savannah, Georgia. After further testing and evaluation, it was released as a single plant (sod-type) bermuda named “U-3.”

In the mid-1940’s, Dr. Glenn Burton of the USDA in Tifton, Georgia asked golf course superintendents in the south to send him plugs of bermudagrass “from the best part of their best green. These plants were increased in number so they could be evaluated for turf performance, winter survival, and ability to grow back in the spring after they were overseeded with annual ryegrass in the



fall. One of the superior plants from this collection was crossed with a disease resistant pasture type bermuda. One of the plants that originated

from that cross was later released in 1952 as “Tifflawn” bermudagrass. This again was a single plant variety, and was sold as sod. Dr. Burton also discovered that other species of bermudagrass produced low growing plants with turfgrass potential. One of these species was African bermudagrass.

Plants of African bermudagrass are low growing, but tend to scalp in the heat of summer temperatures. It is closely related enough to common bermudagrass that it will occasionally cross with common bermudagrass and make a first-generation plant. However, this plant is a sterile “mule” which will never make viable pollen or seed ever. Dr. Burton capitalized on this discovery and made many crosses between low growing African and better common bermuda plant selections. After years of testing hundreds of sterile hybrid mule plants for turf qualities, several “hybrids” were released from the Tifton Experiment Station in Georgia. These included “Tiffine” (an improved lawn type) and Tifgreen, the first major improvement in bermudagrass for greens and other closely mowed turfs. Tifgreen was released in 1956 and is still sold and in use today. Many golf courses in Arizona are planted to Tifgreen 328 bermuda. It is not for home lawn use because it requires low mowing heights of 1/2 inch or less. Its predominate use is on greens mowed at 5/32 inch (certainly not within the

management level of the average homeowner).

In 1960, another sterile vegetative (mule) hybrid was released called Tifway 419. Just like Tifgreen, Tifway 419 had finer leaves and more surface shoots than common bermudagrass, but it grew taller. Tifway is a popular hybrid bermudagrass used in Arizona. It looks best when mowed with a reel-type mower at base height ranges of 1/2 to 1 inch. Although it can be mowed taller with a rotary mower at heights of 1/2 to 2 inches, it often becomes leggy and tends to show scalping injury symptoms during the summer monsoon.

Other vegetatively propagated sterile hybrid bermudagrasses include Tifdwarf and Tifway II. Tifdwarf is used for golf course greens only, while the same applications for Tifway II applies to Tifway.

Tifdwarf was released in 1965 and Tifway II was released in 1981. Since then, seed companies and other universities have commercially released many other improved seeded and sterile "mule" vegetative bermudagrass varieties.

Remember: Any bermudagrass can be increased and sold from vegetative propagation means (sod, plugs, stolons, etc.) It does not have to be sterile. But, all sterile hybrid bermudagrass varieties must be established by vegetative propagation methods. Another thing to keep in mind: If you buy bermuda from seed, it will make seed. If it makes seed, it will make pollen. ■

Reprinted from Turf Tips, January, 2003

Word Wise

Definitions for terms used in this issue...

1-2-3 rule (Things to Expect p.5)—a useful rule of thumb for watering plants: water small plants such as groundcovers and annuals to a depth of 1 foot; shrubs to a depth of 2 feet, and trees to a depth of 3 feet.

ambient (Papaya p.12)—existing or present on all sides; encompassing; as in ambient air pressure.

biodiversity (Ironwood p.18)—biological diversity in an environment as indicated the number of different species of plants and animals.

chelate (Things to Expect p.5)—to combine (a metal ion) with a chemical compound to form a ring.; a compound having a metal ion attached by coordinate bonds to at least two nonmetal ions.

crown rot (Papaya p.12)—any of several mostly fungal diseases of plants characterized by a rotting of the stem near ground level.

damping off (Papaya p.12)—destruction of seedlings by one or a combination of pathogens that weaken the stem or root.

ecosystem (Ironwood p.18)—the complex of a community of organisms and its environment functioning as an ecological unit in nature.

ephemeral (Ironwood p.18)—transient; short-lived.

ferruginous (Ironwood p.18)—rust-colored.

forage (Ironwood p.18)—to search for provisions; food taken by browsing or grazing.

herbaceous (Papaya p.12)—having the characteristics of an herb (no above-ground woody stems); not woody.

hermaphroditic (Papaya p.12)—with pistils and stamens in the same flower; bi-sexual; perfect.

keystone (Ironwood p.18)—wedge-shaped piece of the crown of an arch that locks the other pieces together in place; something on which associated things rely for support.

mulch (Things to Expect p.5)—protective covering, as of sawdust, compost, or gravel, spread or left on the ground to reduce evaporation, maintain even soil temperature, prevent erosion, control weeds, or enrich the soil.

pinnate (Ironwood p.18)—resembling a feather, as in a compound leaf with leaflets arranged on opposite sides of an elongated axis (stem).

propagation (Ironwood p.18)—the act of extending; to cause to increase through sexual or asexual reproduction.

root rot (Papaya p.12)—any of various plant diseases characterized by decay of the roots and caused esp. by fungi.

scarification (Ironwood p.18)—the act of cutting or softening the outer layer of a hard seed to hasten germination.

semi-evergreen (Ironwood p.18)—tending to be evergreen in a mild climate, but deciduous in a rigorous climate.

taproot (Things to Expect p.5)—the main root of a plant, usually stouter than the lateral roots and growing straight downward from the stem.

verdin (Ironwood p.18)—small yellow-headed titmouse found from Texas to California and southward.

The Ironwood: Stately Sanctuary in the Sonoran Desert

BOTANICAL NAME

Olneya tesota

COMMON NAMES

Desert Ironwood, tesota, palo de hierro (iron stick), palo de fierro or palo fierro

Although I've lived in Arizona all my life, I hadn't paid much attention to ironwood trees until one warm day several years ago. It was May, the month that ironwoods bloom. I was traveling north on the Beeline Highway at 60 miles an hour, my attention caught by the trees' blurry pink flower display zooming past on both sides of

the road. I decided I had to stop for a closer look.

A pull-off area just north of the Saguaro Lake turnoff provided a perfect place to satisfy my curiosity. I got out and spent time inspecting the trees' ghost-like bark, gray-green leaflets, and lavender-pink flowers. By the time I was ready to resume my trip their stately presence had captured my heart, and I have loved ironwoods ever since.

The ironwood is one of the largest and longest-lived Sonoran Desert plants, growing 45 feet tall and living as long as 1,500 years. They are often referred to as a keystone species; those which "enrich their ecosystem in a unique and significant manner" and whose "effect is disproportionate to their numerical abundance." The state's largest known ironwood can be found in Child's Valley in western Pima County.

CLASSIFICATION & RANGE

The ironwood tree is the sole member of the genus *Olneya* and is named for the dense, dark heavy wood it produces. Found only in the dry regions of the Sonoran Desert below 2,500 feet, where freezing tem-

peratures are uncommon, the ironwood's habitat is almost an exact match of the Sonoran Desert boundary. (<http://www.pima.gov/cmo/sdcp/sdcp2/edu/iw/map.html>)

Ironwoods are most common along dry ephemeral washes, where they provide a fertile and sheltered habitat. As the tree matures, the environment beneath it is modified, creating a microhabitat characterized by less direct sunlight, reduced surface temperatures, increased organic matter, more available water, and protection from hungry critters. A member of the Fabaceae family, these legumes indirectly add nitrogen (a critical nutrient often missing in our desert soils) to the earth around them. Their seeds provide a protein-rich resource for doves, quail, coyotes, and many small rodents. Air temperatures may be 15 degrees cooler under the dense canopy of ironwoods than in the open desert sun. The ironwood also shelters frost-sensitive young saguaros, organ pipe cactus, and night-blooming cereus.

Growing taller than most trees in the desert scrub, hawks and owls use its exposed branches as perches and roosts. Its canopy is utilized by nearly 150 bird species; 63 percent more birds than creosote, cactus and bursage alone could support. In addition to the birds, there are 62 reptiles and amphibians, and 64 mammals that use ironwoods for forage, cover, and to raise young. At just one site in the Silverbell Mountains, an ironwood-bursage habitat also shelters some 188 kinds of bees, 25 ant colonies, and 25 other types of insects.

If that weren't enough, more than 230



Photography: Candice Sherrill

plant species have been recorded starting their growth within the protective microclimate under the ironwood, giving it the title of “nurse tree of the desert.” A propagation site for wildflowers is created under the canopy that, in turn, is foraged by rabbits, bighorn, and other native species. This all adds up to an extraordinary level of biodiversity and the distinction of being a keystone species.

DESCRIPTION

Ironwoods are highly adapted to the hottest environments in the Sonoran desert. The tree’s natural growth habit is multi-trunked, with branches forming a broad canopy that touches the ground. The bark is gray and smooth, becoming fissured and shaggy on older limbs and trunks. Painfully sharp, slightly curved paired spines, 1/4 to 1/2 inches long, occur at the base of each leaf. The once-pinnate leaves are up to 2 inches long with 6 to 20 grayish green leaflets. Finely haired leaflets are 1/2 to 3/4 inches long. Foliage is semi-evergreen with leaves dropped in response to long drought or freezing temperatures. Flowers range from pink and pale rose-purplish to white, with a sweet pea-like appearance. After flowering in late spring, the resulting pods mature by early summer, with each 2-inch pod containing 1 to 4 shiny brown seeds that are relished by many Sonoran animals.

PROPAGATION & CARE

In its native setting, the hard coating on the seeds passes through the digestive system of deer or cattle. While scarification is thought necessary for seed germination, one source reports success by simply soaking seeds for 24

hours and planting in soil or medium that is thoroughly

warm. Seeds should be planted at a depth of about twice the seed diameter. Most germination should occur within one week. Irrigation should keep soil moist but never soggy. Transplant into the ground from May to September. Some growers are using vegetative propagation (cloning) to ensure consistency of both desirable physical qualities (branching habits, leaf color, leaf canopy, and flower color) and sound horticultural characteristics (rooting, cold hardiness and growth rate).

LANDSCAPE USES

Ironwood’s dramatic character can create a focal point in entries, or as a signature tree in high-visibility areas. On commercial properties, trees salvaged from desert construction sites are transplanted and incorporated into landscapes. These natural forms are excellent in plantings that transition landscape back to undisturbed desert or when used as a security planting. While not considered a fast grower, in xeric landscape situations they will compete with trees like the blue palo verde, growing about two-thirds as fast. If you are considering creating an urban wildlife habitat, the ironwood is a perfect choice. Because they drop a relatively small amount of litter, they are ideal for poolside landscapes. As their popularity has increased, nursery-grown trees are more readily available in a variety of sizes. Note that ironwoods are not recommended for lawn areas because they could be over-watered.



HISTORY, FOLKLORE & USES

Ancient Hohokam made digging sticks of durable

ironwood to retrieve tuberous roots. Native Americans have used the seeds of *Olneya tesota* for food for centuries. Fresh, uncooked seeds are said to have a taste similar to soybeans or peanuts. The Seri Indians of Sonora, Mexico, cooked the seeds in water, rinsing twice, and ate them whole, or ground and salted. Roasted seeds have been used as a substitute for coffee. The wood is so dense that it will not float, and so hard that it has been used for bearings. Dead trees can remain standing for a millennium. One cubic foot of ironwood can weigh up to 66 pounds.

STATUS

The ironwood is widespread within its historical range in Arizona. However, populations in Sonora, Mexico are suffering from the conversion of desert scrub to agricultural use. Woodcutting for fuel and charcoal has further contributed to ironwood losses. The Seri and other artisans depend on the wood for crafting stylized figurines to sell to tourists. Due to the disappearance of ironwood, they now find it difficult to sustain their livelihoods. Arizona’s native plant laws prohibit transportation of ironwood, but do not require its preservation in place. In Pima County, the ironwood has been identified as a habitat associate for the endangered cactus ferruginous pygmy-owl. Urbanization in northwest Tucson is resulting in the loss of these trees. As a result, Pima County’s Native Plant Preservation Ordinance requires that a minimum of 80 percent of “specimen” ironwood trees must either be pre-

served or transplanted during development.

IRONWOOD NATIONAL FOREST

To protect one of the richest stands of ironwood trees in the Sonoran Desert, the Ironwood Forest National Monument was established in June of 2000 by presidential proclamation. It is located 25 miles northwest of Tucson and covers 129,000 acres of cultural and historical sites.

(<http://azwww.az.blm.gov/ironwood/ironwood.htm>)

You can preserve a piece of the Sonoran Desert by adding an ironwood to your landscape. I have never regretted purchasing a 36-inch boxed tree when landscaping my back yard nearly four years ago. It has doubled in size in that time and become home to a pair of verdin that raised three broods of young. This past spring an Inca dove decided to build her nest on top of the verdins—a sort of penthouse arrangement. They must know they're safe from our family cat in its thorny branches. Yes, you might say I'm infatuated, something that started with that trip up the Beeline years ago.

“By keeping ancient ironwoods alive, we maintain the oldest medicine show, native wildlife menagerie and migratory pollinator bed-and-breakfast in town. These hardy old trees provide ideal habitat for everything from night-blooming cacti to tree lizards, desert bighorn and cactus owls. The list of residents living under a 45-foot ironwood reads like the Who’s Who of the Sonoran Desert.”

—Gary Nabhan

Stir-Frying Ironwood Seeds

Excerpted from *“Germinating Ironwood Seeds: An Olympic Event,”* by Carol Zimmerman, which appeared in a 1998 issue of the Horticultural Communicator.

Ironwood seeds are ready to harvest in June and July, but difficult to gather since the seedpods burst open and discharge seeds onto the ground when they are ready instead of politely waiting for you to take them.

I received conflicting advice on germinating seeds. Some said to wait a year after gathering seeds to plant them, and others said to plant them the same year. Almost all the advice was brutal: Dip the seeds in sulfuric acid, Stir-fry the seeds for 3 minutes, Put the seeds in boiling water then pull them out, Soak them in bleach for 10 minutes, Rough them up with sand paper, Nick them with a knife, Soak them overnight (I did this with rainwater), Put them in a jar with sand and gravel then shake the jar, Feed them to a bird and then follow the bird around, Put them in the ground and wait.

I gathered a cupful of seeds in 1996 and again in 1997, and divided the seeds into 2 piles accordingly. I then subdivided each pile into 7 others based on the methods I intended to use. (I opted out on the acid, shaking the jar, and following the bird). There were about 30 seeds in each group, and I kept all 14 groups in the greenhouse.

The results were dramatic. Within one week, two of the “1997 Bleach” seeds had germinated. The tender cotyledon looked plump and green in spite of the cruel way I had forced their emergence. None of the other groups showed any activity.

By the second week there were six “1997 Bleach” seedlings up, three “1996 Bleach,” one “1997 Stir Fry,” one “1997 Plant and Wait,” seven “1997 Soak Overnight,” and thirty-five “1996 Stir Fry.” I had 100 percent germination by stir-frying year-old seeds! There was still no activity from the other groups.

By the third week I still had six “1997 Bleach,” three “1996 Bleach,” one “1997 Stir Fry,” thirty-five “1996 Stir Fry,” and one “1997 Plant and Wait.” The “1997 Soak Overnight” had increased by one, so now I had eight. Again, there was no activity from the other groups.

By the fourth week no new seedlings emerged; however, I lost some of those previously germinated. The “1996 Stir Fry” were down by five, and I lost two of the “1996 Bleach.” I did not believe I would have such luck, and thinking that not all the seeds would come up I planted several to a pot. When all the “1996 Stir Fry” germinated they choked each other to death. At the same time, I was having trouble with a root fungus. If ironwood seedlings get too damp they suffer from damping-off, a seedling fungus. I lost some seedlings to this fungus. The roots need to dry out between waterings. I had these planted in one part decomposed granite, one part sand, and one part potting mix, which I thought would be adequate. I have since learned that planting them in perlite or vermiculite to permit drainage is probably wiser. Over the next several weeks I lost all but two of the “1996 Stir Fry.”

Some seeds just did not germinate at all. Roughing them up with sand paper, nicking them with a knife, or quickly dipping them in hot water was not enough to inspire them. Of the estimated 400 seeds I planted, 12 small trees survive: six “1997 Bleach,” four “1997 Stir Fry” and two “1996 Stir Fry.” ■

Soils Basics

by *Mike Mekelburg, Master Gardener*

It's fairly common knowledge that soil pH represents the acidity of soil, but how many of us know what the p and the H stand for, or the math behind the scale?

In a nutshell, pH can be thought of as a proportion (p) of hydrogen ions (H) relative to hydroxide ions. When the two are in balance, the soil is considered neutral (pH 7).

The pH scale is logarithmic. A change of one unit on the scale equates to a tenfold change in the hydrogen and hydroxide ion concentrations. As hydrogen ions increase, acidity increases and the pH number decreases. As hydrogen ions decrease, the opposite takes place.

Our low desert soils are generally tagged with a pH of 8.3, which is near the upper alkaline limit for satisfactory soil for most of the world's plants. However 8.3 is a wonderful pH for most desert-adapted and native flora.

Another important feature of soil is texture, be it sandy, loam, clay, or a combination of these. Our desert soils are primarily clay, which for our purposes means that water will penetrate very slowly and also evaporate very slowly. That's why you'll often hear Arizona master gardeners advising newcomers to, "Water deeply, but not too often."

Soil fertility can be measured with test kits. For the most part non-native landscape plants benefit from applications of nitrogen—as with citrus in February, May, and August—but phosphorous and potassium are abundant in our soil and take a long time to leach out.

So what conclusions should Arizona gardeners draw from this information? If you want to work with nature, choose native or desert-adapted landscape plants, water with a long run-time and wide intervals between irrigations, and apply nitrogen only to plants that absolutely need it. ■

Garden-Smart TIPS

TIE ONE ON!

There aren't too many of us still wearing pantyhose or knee-highs anymore, BUT if you do have some and get a run in them—don't toss them! Save them and use them next time you need plant ties. They're flexible, stretchy, and gentle on plants. They last forever, and usually their color blends in pretty well with the surrounding environment. You can make tons of ties out of just one pair!

Contributed by Annalisa Palacios

A HANDY HELPER

I have what Home Depot calls a small mortar tub. It's found in the building materials section near the raw cement, and measures about 28 x 20 x 6 inches. It has a rounded bottom and holds approximately 8 gallons by volume, which makes it small enough to drag around even if it's filled with dirt. I use the tub on my potting bench when I'm repotting container plants, and when adding new plants to our yard, I rake the gravel top-dressing to the side and temporarily store the soil from the new hole in it. I use it to collect spent wildflower heads to dry before dispersing them back around the yard, and it has also held modest quantities of shallots or garlic to dry in the shade. It has often been enlisted to hold our garden's harvest, and it has a wide enough opening to make an easy target when I'm 8 feet up on a stepstool picking peas. It also helps me keep water lilies wet while I'm dividing them. This tub is a steal at less than \$5. There is also a 16-gallon version for \$11, but it seems too large for me to handle with ease. **Contributed by Linda Guy, Master Gardener.**



Photography: Candice Sherrill

Worming Your Way to Fertile Ground



Tired of running all the way out to your compost pile with your vegetable scraps? Looking for a fun ecology project for your kids? Interested in trying your hand at composting, but your yard has always seemed too small? If you answered yes to any of these questions, consider trying 'vermicomposting' or worm composting.

Creating a worm bin and managing worms for composting is an easy activity to become involved in, and results in rich organic material to add to your garden. Less material is wasted and dumped in landfills, and you'll have a new subject to astound your friends with at the next cocktail party. The basic requirements for composting with worms are food; a container; the correct temperature; moisture and light; and a quiet, convenient location for your bin and WORMS!

Begin by quantifying the amount of food you will have available for your worms to eat each week. This information will determine bin size and the number of worms you will need. The worms used in vermicomposting eat mainly kitchen wastes. Vegetable and fruit wastes, as well as coffee and tea grounds are acceptable food sources for the worms. Just as with a regular compost pile, meats, fats and oils, pet wastes, and non-biodegradable products should not go into your worm bin. Save your scraps for a week, and then weigh them. Divide this weight by 7 (for 7 days of the week) to get a figure for the Average Weight of available food for your worms each day. Multiplying the Average Weight by 2 will give you the weight in worms you will need for your bin.

Example: At the end of the week you have 3.5 pounds of kitchen waste. Dividing 3.5 by 7 equals .5 pounds of waste each day. Now multiply .5 times 2 to equal 1. You would need 1 pound of worms for your bin. The number of total pounds of scraps per week is also the minimum number of square feet you need for the size of your worm bin. In our example the bin should have at least 3.5 square feet of space.

Worm bins range from simple wooden boxes you can construct yourself and plastic containers you can easily modify, to elaborate commercially produced systems that cost several hundred dollars. Whatever the design, the bin should have good ventilation and drainage. There are examples of bins available at the websites listed at the end of this article.

Once the bin is made, you will need to create a comfortable bed for your worms. Shredded newspaper, straw, sawdust, or brown dry leaves are all suitable materials for the bed, as they retain moisture, provide cover from light, aide in ventilation, and can be consumed by the worms. A little sand or topsoil can also be added.

The bedding will need to be watered until just moist. Worms require a 75 to 90 percent moisture content, or 3 parts water for every part of dry bedding. To determine if you have the right moisture content, pick up a hand full of bedding and squeeze. Just a few drops of water should come out; any more than that and you have over watered your bedding.

Location, location, location is as important to worms as it is to us. You need to find a location for your worm bin that will be convenient for you to use, provide shelter from bright light (even though your bin will probably have a lid on it), allow you to maintain a temperature range of 68 to 90 degrees Fahrenheit, and will not be kicked or jostled. If maintained properly the worm bin will not smell, so an indoor location is fine. A utility room, the kitchen (some people suggest under the sink), the garage or carport, a spare bedroom, or a cool, covered patio can be good places for your bin. Once you know where you are going to place your worm house, you are ready to introduce your worms.

The best worms to use for vermicomposting are the Red Worm, *Eisenia fetida* (I have seen this spelled *Eisinia fotida* and *Eisenia foetida*). These worms have proven to be successful because they feed on the surface of organic materials (great for eating up those apple cores) and can survive in the confines of a bin. The easiest way to obtain worms (unless you are lucky enough to know someone who already has a worm bin and wants to share) is to mail order them. There are many companies that supply worms; a quick Internet search will turn up many choices. Some of the websites given below offer suggestions on obtaining worms.

Feeding your worms is easy. It is suggested that scraps be chopped up a bit to speed the composting process. You may even want to whip your materials in a blender before feeding them to the worms. It is best to alter feeding loca-

tions within the bin, and to bury the food rather than leave it on top of the bed since worms prefer to live away from light. To avoid a fruit fly infestation, first place your materials in the freezer to destroy any eggs that might hatch. Depending on your bin's conditions and the water content of the food you use, you may not have to water your bin. Keep in mind the 3:1 ratio and add water if needed.

If you feed and water your worms adequately, in 4 to 6 months you will be rewarded with a compost of worm "castings" (a polite word for fecal matter). These castings can be added to your garden just like your other compost, or used as top dressing for indoor plants. The castings are rich in nutrients and improve soil aeration and drainage.

I was introduced to worm composting when living in Washington State. Most of the reference sources I found were located in the Pacific Northwest and other more humid parts of the country. From my experience in Phoenix, I can offer a few further suggestions:

If you choose to keep your bin outside, DO NOT bring it inside. I kept my bin on a north-facing covered patio. One night last winter when threatened with freezing temperatures, I decided to bring my bin inside to save my worms from freezing. I woke up the next morning and found many uninvited flying guests in my living room. I moved the bin back outside and spent a week getting rid of the unwanted guests. The worms would probably have been fine with just a sheet of plastic and blanket thrown over them.

My worms seemed to do fine in tem-

peratures from the 40s into the 90s, but my biggest problem was moisture retention. I was using a plastic bin system, and had to constantly monitor it so it did not become too wet or too dry. The bin would quickly dry out in our low humidity and high summer temperatures, but I had to be careful to not flood the poor worms either. Misting seemed to help.

If you leave your home for more than 4 days, you must have someone take care of your worms. I lost mine after a 10-day leave of absence due to lack of moisture.

I made my bin following instructions by Klickitat County. It's an easy project to complete and only requires three Rubbermaid-type tubs, a little wire mesh and a drill. To view the instructions, go to: www.klickitatcounty.org/solidwaste. ■

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HAPPY BIRTHDAY MR. BAKER!

Mr. Baker and his family have set the standard for a community based nursery. For the past 35 years they have been running one of the most popular nurseries in the Valley. They have provided tremendous support for school gardening, community gardening and the Master Gardener program in Maricopa County. They have taken time to educate each of their clients individually as well as support educational programs at conferences and workshops. Their generosity has included sharing their time, their knowledge, and their resources.

On August 2nd at 7:00pm at the Encanto Park Clubhouse, we will be hosting a birthday celebration honoring Mr. Baker. Terry Mikel and Mary Irish will M.C. the event which will be video taped for Mr. Baker and his family. We hope that you will come to share a birthday wish and memory or just to enjoy the stories and honor Mr. Baker.

We have set up a Master Gardener Scholarship fund in Mr. Baker's Name. It is an endowment so all contributions will go on to provide scholarships for the initial training, as well as advanced training and conferences, in perpetuity with only the interest being spent.

If you would like to make a contribution to the Baker Scholarship fund in honor of Mr. Baker's 80th Birthday you can send a check made out to the "University of Arizona Foundation", in the memo line put Baker Scholarship. Send the check care of Lucy Bradley, Maricopa County Cooperative Extension, 4341 E. Broadway Road, Phoenix, AZ, 85040. We will send Mr. Baker a summary of all donations (unless you specifically request to remain anonymous).



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