**Master Gardener Journal**

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**Maricopa County Master Gardeners: Cultivating Plants, People & Communities since 1980** Master Gardener 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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**Northwest Valley Satellite location:** Property Owners & Residents Association (PORA) Office 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.

**Northeast 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) Desert Milkweed, Donna DiFrancesco; Castor Beans, Janice Austin; Grapes, Janice Austin; Evening Primrose, Steve Priebe

Lucy Bradley, Extension Agent, Urban Horticulture
October 2004

10/2 - Irrigation. 9:00 - 12:00 pm. Proper irrigation systems not only keep your plants healthy but they are an important part of water conservation. Learn how to properly choose, install and maintain your irrigation system. Instructor: Jack Blake. Fee $15.00. Desert Garden Institute, University of Arizona, Cooperative Extension, 4341 East Broadway Road, Phoenix, AZ 85040, 602-470-8086 x 823 to register.

10/2 - Getting Started with Wildflowers. 9:00 - 10:30 AM. Late September, October, and early November are ideal months for planting seeds for a wildflower show next spring. Taught by trained docents, this class will teach you about wildflowers in nature and then take you step by step through the planting process. We will spend some time outside in the TBG wildflower garden. No pre-registration required. $9 (includes admission), $7 TBG members. Tucson Botanical Gardens, 2150 North Alvernon Way, Tucson, AZ, 520-883-2702, http://www.tucsonbotanical.org/html/classes.html


10/9 - Fall Plant Sale. 8-4 daily. Drought-tolerant shrubs, vines, trees, cacti, and other succulents and herbs are featured during this seasonal sale. Annual members get special savings, and staff horticulturists are available on weekend to answer questions and offer landscaping advice. The sale continues daily. Admission must be paid to enter the Arboretum - even simply to purchase plants during the sale. All guided walks are included with regular admission. Boyce Thompson Arboretum, 520-689-2723 http://cals.arizona.edu/BTA/events.html

10/16 - Fall Plant Sale. 8-4 daily. Drought-tolerant shrubs, vines, trees, cacti, and other succulents and herbs are featured during this seasonal sale. Annual members get special savings, and staff horticulturists are available on weekend to answer questions and offer landscaping advice. The sale continues daily. Admission must be paid to enter the Arboretum - even simply to purchase plants during the sale. All guided walks are included with regular admission. Boyce Thompson Arboretum, 520-689-2723 http://cals.arizona.edu/BTA/events.html

Illustration: Janice Austin
THINGS TO EXPECT & DO
From the Maricopa County Agriculture Extension web site:
http://cals.arizona.edu/maricopa/garden/html/t-tips/t-tips.htm

Turf
- Apply one inch of water per week to Bermuda lawns
- A light application of potassium on Bermuda in the fall enables it to come out of dormancy in spring with greater vigor.
- Overseed established Bermuda grass lawns from mid October through mid November for a green winter lawn.

Vegetables
- Prepare bed for fall planting

Plant Seeds September
- Snap Beans, Beets, Bok Choy, Broccoli, Brussels Sprouts, Cabbage, Chinese Cabbage, Carrots, Cauliflower, Celery, Chard, Collard Greens, Cucumbers, Endive, Kale, Kohlrabi, Lettuce (Head & Leaf), Leeks, Mustard, Green Onions, Peas, Radishes, Spinach, Turnips

Plant Seeds October
- Beets, Bok Choy, Broccoli, Brussel Sprouts, Cabbage, Chinese Cabbage, Carrots, Cauliflower, Celery, Chard, Collard Greens, Endive, Kale, Kohlrabi, Lettuce (Head & Leaf), Leeks, Mustard, Onions (Bulb & Green), Parsnips, Peas, Radishes, Rutabagas, Spinach, Turnips

Plant Transplants September
- Broccoli, Brussels Sprouts, Cabbage, Chinese Cabbage, Cauliflower, Celery, Chard, Lettuce (Head & Leaf)

Plant Transplants October
- Broccoli, Brussel Sprouts, Cabbage, Chinese Cabbage, Cauliflower, Celery, Chard, Garlic, Kohlrabi, Lettuce (Head & Leaf)

Roses
- Resume full fertilizing of established roses as the weather cools.
- Through September hose off plants in the early morning to increase humidity, control spider mites
- At the beginning of September add an iron supplement if roses show yellowing from iron deficiency
- Watch for second season of powdery mildew

Fruit and Nut Trees
- Late summer application of nitrogen fertilizer on citrus probably helps fruit sizing. This is more significant for fall ripening (navels & tangerines) than spring ripening (grapefruit and Valencia orange) varieties.
- In September apply nitrogen and zinc to pecan trees to produce normal size leaf growth and to enhance kernel development. Pecans also need more water than most other shade trees.

Landscape Plants
- In September apply chelated iron to bottle brush, pyracantha, silk oak, and other plants with iron deficiency symptoms. In October, it is too late to fertilize freeze-sensitive plants such as citrus, hibiscus, bougainvillea, etc. However, early fall fertilization can help the recovery of summer-weary trees, shrubs, vines, ground covers, lawns and flowers. Nitrogen fertilizer should be adequate. Follow with good deep irrigation.
- Cut off spent blooms to stimulate rebloom.
- Cut back watering frequencies as plant needs decrease with shortening, cooling days
- Plant winter hardy trees, shrubs and vines
- Plant wild flowers
- Pre-emergent herbicides can be applied from October through early December for winter annual weed control. Follow the package directions carefully for best results. DO NOT use pre-emergent herbicides where you will be planting seeds this season

Don’t List . . .
- Do not dethatch Bermuda in the Fall. Dethatching should be done in the summer when the grass is actively growing.
- Do not increase opportunities for fungal disease on turf by over watering or watering at night.
- DO NOT OVER WATER, it will result in root rot. Allow the soil to dry out between watering.
Compost: As I See and Understand It

By Dick Gross, Master Gardener

The primary distinction identifying soil as growing medium is the amount of organic material it contains. In its basic form, organic matter is humus, compounds made up almost entirely of two elements: carbon and hydrogen. These are the building blocks of all living matter, whether vegetable or animal. Earth rich in humus (organic matter) that we call “soil” will sustain plant life. The medium we home gardeners usually refer to as “dirt” is lacking in humus. It does not sustain healthy plant life.

Desert soils in the Salt River Basin typically lack organic matter. Back yard composting is an attempt to correct that deficiency by rendering all unused, raw, vegetative debris—roots, stems, leaves, fruit and other plant matter considered waste—to a chemical state that living plants can use for raw materials and nutrients to build new cells.

I use only non-poisonous plant material. I haven’t proof of any harm from their use, but toxic plants like oleander never end up in my compost bins. I don’t grow them, either. I also resist the use of animal waste in any form. Pathogens (disease causing agents) have been traced to poorly composted manure. The entire compost mass must reach a critical temperature to neutralize pathogens. In my opinion, a back yard pile can never sustain enough heat to make them safe and the calculated risk is far outside my comfort zone.

Compost is what happens when thousands of species of microscopic organisms numbering millions per cubic inch of soil eat and digest the plant debris. A common carrot may, I’m guessing, contain compounds of nitrogen, phosphorous, iron, copper, zinc, chlorine, manganese, magnesium, cobalt and a host of other elements. Composting releases those same nutrients back into the soil to be later re-absorbed with the help of a symbiotic relationship with mycorrhiza and the actions of other microorganisms through the feeder roots of the new, living plants. The rate at which decomposition happens in a given pile varies widely with differences in temperature, moisture, air (oxygen), particle size and the type of materials used. If you just make a pile of plant waste and let it sit, the composting process will happen but at such a slow rate as to be of no immediate use and—with time—many useful elements would be leached away. We want composting to be complete and we want it to be relatively fast.

Listed below are practices that I use in my own back yard. Some are the conclusions of my own trial and error and some from the results of other people’s experiments. I have made a few discoveries first conceived by cave men and already common knowledge to everyone else. Specific sources are too obscure to identify but I could name a hundred experts preaching compost technique. I can only claim that this is what works for me in my back yard. I am, however, confident that there is much more to learn and I will happily share that knowledge as I stumble across it.

- **Contain it.** Recycled trash containers sold by the City of Phoenix for $5 are, in my opinion, the simplest and most effective device. Different cities on the program may have containers with slightly different shapes. These are green, cone shaped 1/4 inch plastic with tops and bottoms removed and sides perforated with many 1” holes for aeration. They are, roughly, 36 inches tall with a 22-inch diameter at the top and 30 at the bottom. Set the wide end at the bottom. To turn the pile, insert a forefinger into one of the holes on both sides of the bin and lift it off the pile, like a jelly mold, with little effort and set it aside. Then use a pitchfork, digging fork or shovel to put all the stuff—aerated, blended and re-wetted as necessary, back in again. To get maximum efficiency, turn the mass at least weekly or as often as you can.

- **Alternate containers.** If the volume of organic debris is too small for the larger trash receptacles, you have several options. Pick a secluded spot, shade will work just fine, in your yard where you can just pile the chopped-up waste. Keep it damp, turn it over weekly and salt a little ammonium sulfate in it as you do. You will see the material turn into rich compost in about three months. If the material added is fairly constant in volume, your pile will reach a certain size and stay pretty much the same until you screen and bag it. You can also use 2 cubic foot empty potting-soil bags, like those you get at the nursery—and five-gallon plastic pails. To turn it, just dump the stuff out on the ground or on the lawn, check moisture, add a little green material or nitrogen from a bag as needed and shovel the aerated material back in again.
It is best to dump the bags but you can treat them, until they get too heavy, like “Shake and Bake”—the end tied, of course, or just roll them back and forth.

- **Particle size.** The single, most-critical factor in rapid, complete composting is particle size. The finer you grind, chop, chew, or break it up, the faster it will decompose. Finer particles grossly increase the surface area upon which microorganisms can feed. A pile of logs in a dry climate might require a hundred years to become humus. Reduce them to fine sawdust, add the required nitrogen and you could get finished compost in weeks. If you don’t have a chipper or shredder, use any method you can contrive to break it down. An old butcher block, a tree stump with a wooden mallet and a sharp hatchet are very effective tools for pulverizing green material up to an inch or so in diameter. Wear safety glasses and guard those fingers. The chore is a bit tedious but quite rewarding. Dry limbs are more challenging but, if they can be broken up, their high carbon content helps chemical balance.

- **Temperature.** Heat in the pile is the energy released through the chemical digestive activity in the microorganisms. Aside from climatic variations, the intensity goes up or down with changes in the amount of available nitrogen. To keep the mass active after it has cooled down, I dissolve a half-cup of ammonium sulfate or nitrate in a two-gallon sprinkler-can and sprinkle the solution over an already wetted pile. The affect is similar to adding green grass and much easier.

- **Odors.** You are familiar with the disgusting odor of wet, anaerobic (no oxygen) compost usually associated with grass clippings. To avoid that state of affairs, blend the grass with dry material or already working compost, or dry it out a bit first. To get rid of the smell, you can bury it or figure out a way to dry the stinky mess with lots of air. Spread it back over the lawn or on the ground, dump the bucket or bag on any concrete slab and spread it out to dry. I’ve never known it to stain but don’t do it on your living room carpet. You can also dilute the stinky mess with dry soil or dry organic material. When the aroma is tolerable again, rake it up and put it back in its original container. Anaerobic compost is okay stuff but unfortunately just too offensive for our delicate nostrils.

- **Air.** Composting requires oxygen and to keep the pile active you have to do whatever it takes to aerate it. I like to keep the pile loose. The most efficient method is to move the mass frequently from one spot to another churning it up with a pitchfork and adding water as you do to adjust wetness to approximately that of a damp sponge. This is also a good time to add nitrogen either from greens or from a bag. The soil organisms can’t distinguish one from the other because they are chemically identical and the critters can’t read the label anyway.

- **Pests.** Rodents. These vermin will rarely invade compost piles built strictly from vegetative material but, if they appear, frequent turning of the pile will usually make them move their homemaking and colonization efforts to another locale. Insects? Get used to them. The pile may host a healthy herd of cockroaches but they’re not too likely to abandon such a lush habitat to scrounge around in your somewhat sterile, I presume, kitchen.

- **Finished compost.** Consider it finished when 80 or 90 percent of the original matter—twigs, leaves, etc.—can no longer be identified. It will fall through the tines of a pitchfork. Sift it through half-inch screen. Store the nearly finished material in a separate container. Plastic bags, 2 cubic foot size, work fine. It will continue to work if kept aerated and damp. Throw the coarse screenings into another working pile or use it for mulch. Don’t mix them into soil because the continuing compost activity will suck up some of the available nitrogen needed by the plants.

- **Miscellaneous.** Most dissertations on composting get into lengthy explanations about the carbon/nitrogen (C/N) ratio. My advice to the home gardener is this: forget about it! It doesn’t work. Classify the information as “don’t need to know.” Following the guidelines above, use only those materials available and you will, I guarantee, have good, rich compost. Put the calculator back in the drawer. Never add ashes or lime to desert compost or soils. A final note, eucalyptus makes good compost despite expert opinions to the contrary. I have used it for years.

Illustrations by Janice Austin
A Bountiful Garden

**Vis Medicatrix Naturae: The Healing Power of Nature**

*By Janice Austin, Master Gardener*

Just a few miles east of the Phoenix Maricopa County Extension office, near the juncture of Price and Broadway Road, is one of only four nationally accredited naturopathic colleges in North America where botanical medicine is both studied and practiced. The Southwest College of Naturopathic Medicine and Health Sciences, as part of its curriculum, teaches how traditional and contemporary cultures use plants for their healing properties, remembering that within the plant kingdom are found the origins of most of today's pharmaceutical drugs.

Debra Brammer, N.D., is a Naturopathic Physician and Chair of the college’s Department of Botanical Medicine. Her practice is based upon the principle of *Vis Medicatrix Naturae*, “the healing power of nature,” and part of her tutelage includes the creation of healing gardens. These may be visited by community gardeners who wish to see the cultivation of a variety of common and unusual herbs and plants which possess curative properties.

This type of horticultural therapy can be practiced with common plants through container-cultivated gardening. Easy-to-grow potted herbs may then, in turn, be prepared as botanical medicines and can become a patient’s symbolic method of physically taking charge of his or her health. Such simple efforts can show beneficial results for a variety of patients, whether confined by health restrictions or physically able.

Dr. Brammer explains that standard naturopathic practice considers the whole person, and examines the causes of “disease” and the “obstacles to cure,” such as lifestyle factors. She cites, as an example, a former patient suffering from frequent headaches, who expected to receive white willow bark, *Salix alba* L., *Salix acre*, from which aspirin was originally derived; instead, this patient was examined for what life factors contributed to the development of headaches.

New patients receive an extensive initial interview appointment. This interview is conducted by naturopathic physicians in assessing the many lifestyle factors affecting health, helping educate patients to see the bigger picture contributing to their overall health condition and well-being.

Many botanical remedies come from texts such as *The Eclectic Materia Medica, Pharmacology and Therapeutics* by Felter and Ellingwood or *Culpeper’s Complete Herbal*, which originated in the medieval period, when botanical medical practice often went hand in hand with alchemical and metaphysical experimentation. For example, *Aconitum napellus*, Monkshood or wolf’s bane, was grown for medicinal uses, but was also considered useful in becoming invisible and as a protection from werewolves and vampires!
In general, therapeutic plants are found in most gardens today because of their sundry culinary uses. Some commonly cultivated medicinal plants include chili peppers, Capsicum, a member of the Solanaceae family. Peppers, which are all considered useful as circulatory stimulants and digestive aids, are in addition, an excellent source of antioxidants, and contain more Vitamin C than oranges, according to Dr. Brammer. Garlic also possesses many health benefits, being considered an effective blood tonic, circulatory stimulant, digestive enzyme, natural cholesterol reduction agent, and as both an anti-bacterial and anti-parasitic agent. Passionflower, Passiflora incarnata/edulis acts as a general central nervous system depressant, which in small doses can have a calming, relaxing and anti-anxiety effect.

Other frequently cultivated plants containing therapeutic properties include the toxic botanicals, designated as such to naturopathic physicians because they can “be strong allies when used appropriately and with a full understanding of their action and the sequelae of toxicity,” according to Brammer. Some Southwestern plants in this category include Cactus grandiflorus, Night-blooming cactus, which is well known as a treatment for cardiac conditions. Turpentine Bush, Ericameria (Haploppappus) laricifolia (Gray) and Desert Broom, Baccharis sarothroides (Gray), are both used for anti-inflammatory baths.

They may be made into teas or salves, helpful for conditions ranging from arthritis to muscle pain. Some say the Apache leader, Geronimo, used Turpentine Bush as his most effective medicine.

A walk through the well-labeled medicinal gardens at the college reveals an arrangement of plants based on their therapeutic applications, including respiratory, sedative, cardiac, and circulatory uses. The community is welcome to explore the possibilities in creating botanical medicine gardens. Each April interested gardeners may also attend the Southwest Conference on Botanical Medicine in the college’s exhibit hall. Topics on ethnobotany, such as “Obscure Medicinal Plants of the Southwest,” are presented by well-respected authorities, such as Michael Moore, director of Bisbee’s Southwest School of Botanical Medicine and author of Medicinal Plants of the Desert and Canyon West, the Mountain West and the Pacific West. There are also guided herb walks through the Desert Botanical Gardens with ethnobotanists, such as Phyllis Hogan, founder of the Arizona Ethnobotanical Research Association and an instructor in bilingual programs with the Pima, Hualapai, and Navajo tribes, or popular Sonoran Desert botanical illustrator, Mimi Kamp.

Photos by Janice Austin
**WATER FEATURE**

**Monsoon Harvest**

By Janice Austin, Master Gardener

Desert rainwater is a valuable and unpredictable resource, coming to us free and natural, containing little salt and lots of nitrogen for the first 24 hours after it falls. Southwestern gardeners watch as the scorching skies grow heavy with monsoon moisture, hoping for a welcome bounty over the monotonous, dry summer season. Some of these gardeners are choosing to harvest this scarce and beneficial rainwater, because plants grow better with rainwater than groundwater, with its load of salt and chlorination.

Historically, Southwestern municipalities have hastened to move desert rainwater away from the cities in the quickest ways possible, because of heavy localized rains that have in the past caused extreme flooding; however, there is new thinking regarding rainwater as something to be managed and stored. As the long drought continues, some cities are striving to raise awareness of water use and management, such as the City of Tucson’s free downloadable manual on Rainwater Management and Harvesting Principles, available at: http://dot.ci.tucson.az.us/stormwater/education/whm.pdf. There are many ways to improve water use that may benefit all of us.

To begin to do this, start small, in your own backyard. Assess your individual property to determine the site “watershed.” Usually rooftops make up the highest elevation of a site, and this elevation is considered the top of the watershed, the best place to collect rainwater. The most practical way to do this is by installing rain gutters, along with something in which to collect it, moving it into rain barrels or cisterns.

Good assessment and planning also help prevent flooding on your property, as will incorporating water management features, such as berms, swales, basins, French drains, or gabions, into your landscape. Note that rainwater coming off an asphalt roof will not be suitable for drinking water, nor for leafy vegetables, though it can be used for watering woody plants, which remove any toxins from the asphalt. But, really, how much rainwater can there be in the desert? Why bother to collect it at all?

Let’s take a closer look. To calculate the runoff from a roof, measure the footprint of your dwelling drip line—Width x Length. Roughly, it is possible to collect 600 gallons of water per inch of rain falling on 1,000 square feet of collection surface. On average, the Phoenix area receives approximately 7 inches of rain annually. That is a lot of water when it falls in heavy, localized monsoon rains, if left unmanaged and flowing into the streets. By putting up rain gutters, it can help keep that beneficial bounty at work on your property, benefiting your plants, and in turn, help reduce street flooding in your neighborhood.

The task of putting up rain gutters is not what it used to be, back in the days of working with sharp-edged, cumbersome aluminum gutters. Now, for just a little more money at your local major home improvement center, you have the option of choosing vinyl rain gutters, which are surprisingly easy to install. In addition, vinyl rain gutters never require painting and have a limited lifetime warranty. Although aluminum gutters are cheaper to buy, in the long run they also require more time for caulking and special tools for installation. The only tools needed for vinyl gutters are safety glasses, measuring tape, pencil, level, chalk line, saw, and a drill and screwdriver set. Their simple vinyl components of gutters, joiners, hooks and end caps snap together like children’s “Tinker Toys.” (See photo)

Begin by sketching your total layout. To put up a rain gutter, carefully measure the length of each gutter run and determine the best drop outlets at points that will allow for drainage away from the building foundation. Take your time in planning. Remember that one drop outlet is required for every 40’ of gutter. Additional downspouts increase handling capacity, whether into additional rain barrels or landscape features. At the high end of the run, drive a nail _"_ below the top of the fascia board. Snap a “level” chalk line from this nail to the opposite end of the gutter run. Drop the chalk line 1/8” for every 10 feet of gutter and snap your “guide” line. Cut the measured gutters straight, using a cutting guide, if necessary. Don’t rush and work safely. Then, assemble the gutters on the ground, slipping the various components and cut gutters together, according to your measured plans. Hold up the first gutter section along your “guide” line, and begin fastening it from the middle of each section with 1 _"_ screws. No caulking is required, as it snaps together with a leak-proof seal into the hooks, joiners, and end caps. Continue with the process, until done. You may also opt to slip in leaf guards onto the tops of the gutters, to keep out leaves and debris.

The real highlight of the rain gutter construction process is the trial run, when a bucket of water is hoisted aloft and poured into the high end of the gutter, to see how it runs its course for the first time. If you prefer to not tackle this project, either aluminum or vinyl gutters can be installed for you at your location. There are many creative ways you can choose to make use of the coming monsoon harvest, and these can benefit you, your plants and your property for a long, long time.

Photo and Illustration: Janice Austin.
A beautiful and inviting landscape can be a welcome escape from our often hectic lives. Installing and maintaining a desert landscape with a balanced design, intriguing scents and textures, and year-round color may seem like a daunting and pricy task. However, with a little research, lots of commitment, and a pinch of patience, you can install and maintain a low-water-use landscape that is not only aesthetically pleasing, but time- and money-saving.

WHY CHOOSE LOW-WATER-USE LANDSCAPING?
There are numerous advantages to low-water-use landscaping, including:

- Using less water on landscaping saves money
- Plants can handle Arizona’s alkaline soils without the need for extra fertilizer
- A variety of plant colors, forms and textures to choose from
- Plants grow stronger and look healthier than their high-water-use counterparts

Before purchasing plants for your landscape, be sure to choose the right plant for the right place. Consider the following:

- Sun exposure and shade
- Match mature size of plant to space available
- Group plants with similar water needs
- Plant characteristics, i.e., thorns near sidewalks
- Bloom time for year-around color

Make a list of your desired plants and call your local nurseries to be sure they have the plants in stock. Remember that some plants may be seasonally stocked, and do not be afraid to ask the nursery to order the plants for you.

A great resource is Landscape Plants for the Arizona Desert, a free publication produced by the Arizona Municipal Water Users Association (AMWUA) and available at most nurseries and local water conservation offices. This brochure contains over 200 low-water-use plants with sections devoted to trees, shrubs, groundcovers, vines, grasses, cacti, succulents and annual and perennial wildflowers. Colorful photographs accompany almost every plant, while an informational chart compares characteristics like drought and heat tolerance, leaf structure, bloom color and mature size.

TIPS FOR CHOOSING PLANTS

- Bigger is not always better. Plants in smaller containers will rapidly catch up to their larger, more expensive counterparts.
- Select plants that have fleshy white roots. Make sure there are no circling roots or roots coming out of the bottom of the container.
- Be sure there is nothing growing on the surface of the soil in the container, such as weeds or mold.
- Inspect the stems or trunk for any injuries.
- Take an overall look at the plant and make sure the leaves do not look discolored or drought stressed.

Some cities have resources available, including free brochures, classes and one-on-one guidance to help multi-family properties manage their landscapes efficiently. Check the AMWUA Web site at www.amwua.org for a listing of your local city water conservation offices.
A Few Of My Favorite (Native Plant) Things!

by Donna DiFrancesco, Master Gardener, Water Conservation Specialist, City of Mesa

(Sing to the tune of “My Favorite Things” from The Sound of Music)

Striking white bark that peels off the branches,
Large fragrant flowers that do evening dances,
Paperlike pods look like butterfly wings...
These are some of my favorite (native plant) things.

K, OK... so the original is better, and I should keep my day job. But, when asked to write an article about native plants, there were so many that came to mind, these four are among my favorites, and I don’t think I would plan a landscape without them:

Palo Blanco, Acacia willardiana, 20’ tall by 10’ wide, full sun.

This graceful and wispy tree is native to western Sonora in Mexico. Perhaps it is because I was born and raised in New Hampshire surrounded by birch trees that I like the characteristic peeling white bark - one of the major features of this tree. Mary Irish describes it perfectly in her book, Gardening in the Desert: A Guide to Plant Selection & Care... “The bark is charming; it is white (hence, the name), and great sheets of it peel off regularly, like the pages of an ancestral scroll, revealing the secrets of the bark beneath.” Wow, can anyone beat that description? The soft foliage is made up of tiny leaflets attached to a long, slender petiole, and creamy-white, 1-2” flower catkins grace the branch tips in late spring. The weeping branches are also a favorite perch for hummingbirds. This tree is perfect for the limited space we often find in our desert landscapes. It works well in side yards, or even massed together (3-5 trees) to produce a small grove for a larger area. This is one of those native plants that generally appears very unimpressive in the nursery container; someone said to me once, “it’s just a stick.” I think you’ll be pleased if you give this ‘white stick’ a try.

Desert Milkweed, Asclepias subulata, 3’ tall by 3’ wide, full sun.

But they’re OK and seem to do little harm to the plant. In fact, leave the aphids alone, and soon beneficial insects will move into your garden to clean house (look for ladybugs, lacewings and itsy-bitsy parasitic wasps). So now you have a breeding ground for the good bugs, and they can assist with other pest problems in your landscape. From about April through most of summer, the tops of the plant are covered with creamy-white baseball-sized flower clusters. The flower nectar is the absolute, most favorite food of the adult tarantula hawk wasp. I know, I hear you saying “whoa--Donna, you’re suggesting that I use a plant that will attract a wasp to my yard?” Oh, but this is the most beautiful wasp you will ever see, two-inches long, with a metallic blue-black, robust body. And I promise, tarantula hawk wasps are not aggressive, unless you provoke them. They slowly fly from flower to flower, and will work a cluster intently for minutes at a time; they are so focused on the nectar that they don’t even notice anything else around them. The way they work the flowers is a lot like hummingbirds, and watching them can be as much fun. Like most milkweeds, this plant (flowers and foliage) also attracts the monarch butterfly, and even more commonly in the low desert, the look-alike viceroy butterfly. Make sure you plant in well-drained soil and don’t overwater.

Yellow Orchid Vine, Callaea macropterum (may be sold as Mascagnia macroptera), 15' tall by 15’ wide, full sun.

This nearly leafless, succulent milkweed is one of the toughest plants you can have in your landscape. Native to southeastern California and southwestern Arizona, it can be used as an accent or sculptural component. Desert Milkweed is the plant that I like to call an insect condominium--but wait, wait, wait--before you let that deter you from trying it, let me explain. First, you’ll see a lot of milkweed bugs around. They are the showy red and black, half-inch long plant bugs, essentially harmless to the milkweed and they don’t bother much else. For a short period of time in the early spring you’ll notice a halo of yellow-orange around the tips of the stems. A closer look will reveal that these are aphids.

Photo: Donna DiFrancesco

Photo: Steve Friebe
This interesting vine is native to Mexico. In my experience it requires a little patience when getting it established, but the payoff is worthwhile. It is a twining, woody, evergreen vine that is covered with clusters of small, yellow, orchid-like flowers in the spring. Though the bloom period doesn’t last for a long time, the seedpod that follows adds even more interest to the plant. It is a showy, lime-green papery pod about 2-3 inches in diameter. Because of the look and shape of the pods, it is sometimes called Mexican butterfly vine. Keep in mind that it also grows well as a sprawling shrub or groundcover. Once the pod dries up, it will turn tan in color and is great to use for decorating. This plant can be a little difficult to find, so ask around or look for it at botanical garden plant sales.

**Tufted Evening Primrose, *Oenothera caespitosa*, 1’ tall by 2’ wide, full sun to part shade.**

The first time I used tufted evening primrose in a landscape, they all died within a few months. I was pleasantly surprised a few months later when emerging seedlings replaced the original plants. Don’t worry, this primrose does not have the vigor and invasive character of the pink Mexican evening primrose. It’s much better behaved in the landscape, and oh, what beautiful flowers. This native to the western U.S. and Mexico is a low mounding, spreading clump of soft, narrow lance-shaped leaves. In spring and early summer, lightly fragrant, white 3-4” flowers open in early evening. In fact, go outside around sunset and you can watch them open up. What’s even more fun is watching the beautiful hawk moths that like to fly in and sip the nectar from the flower, while they help with pollination. By midmorning the following day, the petals turn pink and will eventually droop. The elongated seed capsule eventually turns woody, it splits open at one end and peels back, and ends up shaped much like... well, like an octopus.

There are many other plants I’d love to talk about, but my space is limited. The Valley city water conservation offices recently updated their plants booklet, *Landscape Plants for the Arizona Desert*. One of the new features of the booklet is to provide the ‘native to’ information about each plant, so you can tell which are native to the Sonoran Desert or at least to the deserts of the southwest. To get a free copy of the booklet contact your local water conservation office - for contact information visit [http://www.amwua.org/xscp-brochure-plantsforarizona.htm](http://www.amwua.org/xscp-brochure-plantsforarizona.htm).

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**Ask A Master Gardener**

*By Judy Curtis, Master Gardener*

**QUESTION:**

What are the quarter-size holes in the ground around my Palo Verde tree?

**ANSWER:**

A client called the Master Gardener hotline last week and recounted an amazing story. She was in her yard one evening recently visiting with a neighbor. They noticed holes around the base of a nearby Palo Verde and commented on them. Within a few minutes they saw large beetles begin to emerge from the holes, eventually about three dozen in all. At the same time male beetles, which they later learned had exited a few days earlier, began to fly in and proceeded to mate with the females. No sooner had they mated than the females returned back into the holes.

Most of us have seen the male Palo Verde beetle (*Derobrachus geminatus*) on monsoon nights as they swoop past our heads like bats, or we may find one on the patio in the morning, crawling into a corner out of the sun. While these beetles are identified with the Palo Verde tree, they will attack other varieties as well.

The eggs laid by the female in the ground hatch into grubs that attach themselves to roots where they feed for the next three years. Large infestations can eventually cause tree death and symptoms of decline in the tree may indicate their presence.

Control is difficult. Insecticides are not usually effective because the grubs are too deep in the soil. At this time of year, if the beetles are ready to emerge, they can be flushed out of the holes with water and dispatched manually. Another suggestion is to lay mesh screening around the base of the tree and cover it with soil. This prevents the beetles from exiting the holes to mate and over a period of years could reduce their numbers. A good deep watering occasionally with a light fertilization can spur new root growth to help the tree compensate for the effects of the beetle.

In spite of the harm they do they are one of our more unusual desert denizens. Whether you are horrified or fascinated by them, they are most interesting to observe.
Dispelling Common Horticultural Myths
By John Begeman, Horticulture Agent, Pima County Cooperative Extension

Make a funny face, it’ll stay that way. Step on a crack, you’ll break your mama’s back. A pinch of salt over your shoulder brings good luck. Such are the countless myths in our society, and the horticulture field is not exempt from them. Although numerous scientific studies refute many commonly held horticulture practices and beliefs, they still prevail with widespread acceptance. As a horticulture agent for 23 years, I’ve heard many tall tales on tree care. Let’s discuss seven of the most common tree-care myths.

Myth No. 1: The root system of a tree is a mirror image of its above ground portion.

Since studies began on the structure of tree roots back in the 1930’s, researchers across the country have found a consistent pattern to tree root development. This root pattern, regardless of species or location, is shallow and wide. Findings indicate lateral roots of trees extend 1.5 to four times the width of the canopy and are usually within the top two feet of soil. As soil depth increases, root growth diminishes, due primarily to a decrease in the levels of oxygen and moisture. Occasionally roots can grow deeper, but only if soil conditions are just right. Here in Arizona, a mesquite tree was found to have a one fourth to one half inch diameter roots extending down more than 100 feet in a gravel vein of a pit mine. This is the rare exception.

Myth No. 2: Large planting holes, both deeper and wider than the root ball, are best for tree establishment.

A common practice here in the Southwest, as in other part of the country, is to dig a large hole to accommodate root development after planting. These holes can be of cavernous proportion, as wide and as deep as 5 feet. Yet when we look at the natural, shallow-wide configuration of root systems, common sense brings into question the validity of this approach.

Studies looking at the effects of these large holes have consistently shown they are a detriment to tree establishment. This is primarily due to subsidence of the root ball. Soil dug and disturbed below the root ball will settle after planting. As the root ball sinks, soil covers the roots and trunk base. As little as half an inch of excess soil over the root ball can inhibit or prevent water from entering the root ball. Slower to develop, but just as serious, are problems related to contact of soil with root collar tissue. The root collar is the junction of the roots and trunk, typified by the flare of major lateral roots. The root collar is a part of the trunk and, as such, is not specialized to resist constant soil moisture. Gas exchange between the atmosphere and phloem tissue of the root collar is restricted. This causes a gradual death of phloem tissue and an increased susceptibility to pathogens such as Phytophthora root and crown rots.

Planting holes should be dug no deeper than the height of the root ball. The point is to set the root ball on undisturbed soil to prevent settling. Because of the wide-spread development of lateral roots, the soil hole should be dug three to five times wider than the diameter of the root ball. Roots will grow more quickly into loosened soil, thus speeding up the tree’s establishment period.

Myth No. 3: Amending the backfill of planting holes with organic amendments is beneficial in promoting root growth.

Over 30 studies have been conducted over the past 15 years and only one has shown a consistent advantage to using organic amendments, such as peat, compost, or bark. In most cases organic amendments inhibited top and root growth. When combined with a deep planting hole, organic amendments increase subsidence of the root ball. As the organic matter decomposes it shrinks significantly. This results in even greater settling of the root ball.

Illustration: Janice Austin

Much has also been learned about the detrimental effects of soil interfaces on root growth. These interfaces are created when divergent soil types come in contact - interface each other. They are unavoidably created when trees are planted. Soil of the root ball, whether field or container grown, are almost always different from the soil at the planting site. Roots have difficulty passing through this interface. When backfill soil is amended with organic matter, an additional interface is added. The first interface is between the root ball and the amended backfill, the second is between the amended backfill and the existing soil. Failure to penetrate these interfaces is a common cause of circling roots and unsuccessful plant establishment.

Planting holes should be backfilled with the same soil taken from the hole. No amendments should be incorporated into the backfill. Even if soil conditions on the planting site are poor, trees must be able to establish roots in the conditions that exist, for long term survival. Loosening or tilling the soil, to the depth of the root-ball, in a circular area three to five times the diameter of the root ball will be most effective in speeding root establishment.
Myth No. 4: Pruning at the time of transplanting aids plant establishment by balancing top growth with existing roots, thus reducing transplant shock and easing establishment.

In most plants, buds and young leaves produce compounds which stimulate root initiation and growth. Numerous studies on the effects of transplant pruning have shown that removing buds and young leaves reduces new root initiation and growth. Although pruning stimulates growth of individual branches, it generally has a dwarfing effect on overall size. Any removal of top growth also reduces foliage, and with it the ability of the tree to manufacture sugars and carbohydrates necessary for new root development. Pruning at transplanting has been shown not to enhance survival or establishment of container-grown or bare-root plants.

Myth No. 5: Pruning paint promotes rapid closure of the wound, repels water, and protects the wound from decay and disease organisms.

The practice of applying pruning paints or wound dressings to pruning cuts continues, despite the fact that research has shown no value in the use of such products. Wound dressings do not prevent cracks, mushrooms or wood rot. Rather than sealing off a wound and protecting it from rot and disease organisms, just the opposite is true. When exposed to the sun, the protective coating often cracks, allowing moisture to enter and accumulate in pockets between the wood and the wound dressings. If pruning shears or saws are contaminated with a disease organism, such as sooty mold or slime flux, the wound dressing can seal the organism against the wound. With the accumulation of moisture, a perfect environment is created for the disease to develop. In addition, asphalt-based wound dressings can be phytotoxic.

Much has also been made regarding the size of the cut in relationship to pruning paint. Many believe that pruning paint does not need to be used on small cuts, but any wound larger than 1 inch in diameter should be treated. Regardless of the size of the cut, pruning paints or wound dressings should not be used. Properly made pruning cuts will successfully callus over much more rapidly if left unsealed.

Myth No. 6: Branches should be cut off flush with the trunk to hasten closing of the wound and prevent decay.

To this day, much of the pruning that is done does not take into account the importance of the branch collar. The collar is the place at which the branch joins the trunk. Usually it appears as distinct swelling at the base of the branch. In some species, this swelling is not as noticeable, but the collar does exist on all tree species.

Numerous studies have shown the important role the branch collar plays in resisting the spread of disease organisms and decay. Chemicals within the collar provide the protection. When flush cuts are made, these chemicals are removed. Even worse, the cut is made into trunk tissue, making callusing-over of the wound difficult, if not impossible.

Cuts should never be made flush with the trunk. Cuts should always be made just to the outside edge of the swollen bark collar region. In this way the collar remains intact and only branch tissue is cut, with no damage to the trunk.

Myth No. 7 Caliche and other hardpan layers in the soil must be removed at the time of planting to accommodate the roots ball and future root development.

In the desert Southwest, a common obstruction to planting is a layer called "Caliche". It is a hardpan that formed by the cementing together of soil particles with lime (calcium carbonate). It can be as hard as concrete and anywhere from a few inches to a few feet thick. Sometimes a caliche layer can be found at or within a few inches of the soil surface. Other times it may be several feet below the surface.

Many types of hardpans, such as caliche, exist in other regions of the country. In Arizona, the standard practice has been to remove it with pick axe, crowbar, or even jack hammer. Much too much effort has been put into removing caliche, especially layers that are down several feet deep. Even relatively shallow layers of caliche can be left in place. Generally these layers are not solid or continuous, but rather fractured allowing water to drain through. In the desert native Palo Verde, mesquite, and ironwood grow successfully over caliche layers very close to the soil surface. Excavations of mesquite trees growing on caliche show the trees ability to root over and even into and through this hardpan. As long as several inches of soil overlie the caliche hardpan, trees can be planted without removing the caliche. The same type of mounding technique employed on poorly drained soils or those with high water tables can be used for planting over hardpans. Smaller root balls must be planted where hardpans are close to the soil surface.

As with standard planting recommendations, the root ball should be set on undisturbed soil, in this case the hardpan itself. Soil is then bermed up to cover the portion of the root ball that extends up above ground. If the hardpan is solid and will not drain, then a drainage column can be dug through the hardpan, not under, but to the side of the root ball. This will funnel water away from the root ball base and reduce the danger of roots becoming waterlogged.

By no means are these all the prevailing myths of horticulture. They are, however, some of the most common and the ones that have been addressed with much scientific research. It behooves all those working in the horticultural profession to get the word out, and help put these myths to rest once and for all.
**Out in the Garden**

**Hot Fun in the Summer Time**

*by Janice Austin, Master Gardener*

There is an old Phoenix boast that in summertime it is hot enough here to fry eggs on the sidewalk—well, it’s true! You can! When you live in a city which receives more than 320 days of sunshine a year, it seems a shame not to take advantage of all that free energy. In June, *The Urban Farm* in Phoenix hosted a Solar Oven Workshop, where more than 25 eager chefs and gardeners gathered to learn how to make a solar oven and how to use it. Solar cooking has real appeal for multi-tasking gardeners who can be outside, simultaneously cooking and cultivating.

The solar seminar was timed to coincide with June 21st’s Summer Solstice, when the sun moves to its most northern location over the Tropic of Cancer. Longtime Tucson desert gardener, Dan Dorsey, taught to a full house, which included a Hong Kong biology teacher, a German sculptor, a local public artist, an attorney, several landscape designers, organic farmers, Arizonans from Buckeye to Apache Junction, with more than one Master Gardener in attendance. We wanted to know what to do with all this sunshine!

Dorsey, who has bachelor’s degrees in Forestry and Photography, and is currently completing a Master’s degree in Landscape Architecture at University of Arizona, talked about this Valley of the Sun having “the most concentrated solar energy in the world,” providing “an energy that takes nothing away from the environment in its use.”

He explained how easy it can be to get cooking with a basic solar oven constructed from simple materials costing a mere $18, capable of reaching 200-225 degrees. For those disinclined to make their own “Easy-Bake” solar oven, they More sophisticated commercial models range from Kerr Cole’s $150 oven, which cooks between 325-350 degrees, and a $250 Sun Oven, which is capable of baking bread, heating up to 425 degrees. This “Sputnik-shaped” oven is far removed from the single reflector, cardboard box model constructed in the workshop, framed in sleek fiberglass, with four collapsible metal reflectors, a self-leveling tray and a convenient carrying handle.

To build a simple, inexpensive solar oven, each student was given a large, unassembled cardboard box, obtained from a mail delivery service for $4. The box was then assembled, top and bottom flaps overlapped into a closed position. 45 degree cuts were made on two parallel sides using a straight edge and box cutter, cutting all the way through. The box then was rendered into halves, flattened, and the top flaps cut off and put aside. Each half was reassembled, with the top flaps slipped into the overlapped base, which then were taped into place with duct tape. Next, the halves were combined, one inside the other, and a layer of newspaper was cut and inserted between all sides of the doubled box halves. Duct tape was used to seal all the open edges, including the bottom edge of the square base. Then, three metal brads were put through punched holes at the front edge lip of the square base, protruding 1”. Next, the reflector was cut from a separate piece of heavy cardboard to fit over the box opening: one side of the reflector was covered with aluminum foil, shiny side up, and all edges then sealed with duct tape. At this point in construction, boxes were checked for a fit with the glass pane, which is supported over the oven by the protruding brads at the base; the reflector was then duct taped to the top of the oven, like a hinge, allowing the reflector to easily close and open. (As an option, one may paint the interior of the oven with nontoxic, black paint, to increase the heat.)

To use your oven, turn it to face south, showing no shadows inside the cooking area base; then raise the reflector up and look for a bright reflection at the center of the cooking area base—this will be at about a 30 degree angle—and then stake your reflector open at this angle, using a bit of wire. Remember to adjust your oven as the sun moves, keeping the foil reflection at the center of the base. If possible, this is done about every half hour. If not possible, face your oven due south and hope for the best.

**Tips for Successful Solar Cooking**

- Use less water than conventional cooking, because your solar oven cooks at a lower temperature;
- By using covered glass or metal cooking utensils you can double the cooking temperature.

Solar ovens are an interesting project to do with children, culminating in a fun first snack, like baked apples or cookies. Remember to paint the exterior of your solar oven as part of the project. And be sure to take your solar oven camping, so you can cook without fire during this time of drought in the Southwest. And keep your home cooler by doing the cooking outside, saving money on your air conditioning.
STARR™ Attraction

By Janice Austin, Master Gardener

Mountain States Wholesale Nursery announces that a new hybrid clone is on its way to a nursery near you! This *Calliandra*, Sierra Star™, will shine brightly in your garden, loving full sun and thriving in those troublesome reflected heat exposures where most other plants wilt.

A hybrid between the Pink Fairy Duster, *Calliandra eriophylla*, and the Baja Fairy Duster, *Calliandra californica*, the new Sierra Starr™ shows off desirable attributes of both parents. Hummingbirds are drawn to its year-around flashy red flowers spangling the densely branching, evergreen foliage. As a clone, Sierra Starr™ may be used in both brilliant masses or semi-formal plantings, growing moderately to 4-5’ high x 4-5’ wide.

You may find this plant a stellar performer in your garden galaxy.

GARDEN-SMART TIPS

Make Your Bed and Bask In It!

By Candice Sherrill, Master Gardener

Put a rusty old bed frame to use in your backyard. Partially bury it and turn what would have been the mattress area into a mounded “bed” for annuals. Each season, create the look of a patchwork quilt by planting the bed with two colors of annual plants. Photo by Janice Austin.
09/04/2004 1:00-4:00 pm
Rose Gardening For Fall
Does anything else smell as sweet? Roses grow well in the desert- when you know the tricks! Learn what it takes to have a glorious show. You’ll learn planting, pruning, watering, and fertilizing. Instructor: Marylou Coffman $20

09/11/2004 9:00-1:00 pm
Tree Pruning/Tool Maintenance
Come and learn how to protect your investment. Learn 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. Instructor: Laurel Reader $20

09/15/2004 6:00-8:00 pm
Conversion to Desert Landscape
Ready to overhaul, bulldoze, dig up and start over? Before you reach for that shovel, come learn the basics of converting your old landscape into a beautiful desert-adapted space and enjoy a beautiful lower-maintenance yard. Instructor: Jean Slack $20

09/18/2004 9:00-12:00 pm
Turf Care & Overseeding
Your neighbors will be green with envy when they see your perfect lawn. Learn how to select the best turf varieties. We’ll divulge the best techniques for mowing, fertilizing, watering, and overseeding. Instructor: Sharon Dewey $20

09/25/2004 9:00-12:00 pm
Herb Gardening
Everything you ever wanted to know about growing herbs in the Desert Southwest. Learn culinary uses, crafting, landscaping, and body and health care uses. Join us for a fun hands-on lecture and garden tour. Instructor: Mike Hills $20

10/02/2004 9:00-12:00 pm
Irrigation
Proper irrigation systems not only keep your plants healthy but they are an important part of water conservation. Learn how to properly choose, install and maintain your irrigation system. Instructor: Jack Blake $20

10/09/2004 9:00-12:00 pm
Wildflowers
Would you like to re-create the beautiful wildflower landscapes you see on the hillsides? You can! Let us show you how, where and when to plant for a glorious show. Instructor: Judy Curtis $20

All classes are held at the Maricopa County Cooperative Extension Office at 4341 E. Broadway Rd., Phoenix 85040. Please call 602-470-8086 x 823 to register. Please mail checks made payable to the University of Arizona ATTN: Desert Garden Institute
http://ag.arizona.edu/maricopa/garden/
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