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Things to Expect and Do

It seems this past summer reminds me more of summers in the ‘good ole days’ than we’ve had in years. The violent summer storms ripping through almost unpredicted and wreaking havoc in their wake define monsoons in the desert. These storms, spotty by nature, help some and hurt others but the cooling effect and clean smells afterwards seem to be a tonic for people and plants.

Fall growth started earlier this year with roses, citrus and many other plants pushing growth in mid-August thus demanding fertilization to accommodate this early spurt. The late August-early September fertilization on citrus, if you got it on should ensure a nice fall flush and will size-up the tangelos and tangerines nicely. Fall fertilizations will benefit most plants that are struggling to have a flush of growth before slowing down for the winter. Remember the growth put on before dormancy will store more energy during the winter that will be available to the plant when it pushes growth in the spring.

As things cool down some vegetables and flowers can be planted with few pests expected. Aside from the potential of a couple armyworms and maybe a few aphids the fall season allows plants to grow unabated. They seem to thrive as each shortening day portends cooling and relief from so much direct sun. So before mid-October plant warm season vegetables like tomatoes, peppers and the like and after mid-October, shift to cool season vegetables (the ones you eat the roots, stems, shoots and immature flowers). Fall planting of annual flowers repays you with months of bloom. The nurseries offer a myriad of choices and they will all work. Think about sliding in something a little different this year. Icelandic Poppies interspersed in the flower bed really brighten things up.

Terry H. Mikel,
Extension Agent,
Commercial Horticulture

Potpourri of Pest Facts

What would it mean if this were a "world without pest control?" The following are varied "factoids" on pests and pest management.

- Cockroaches may transmit food poisoning, cholera, dysentery, and typhoid.
- A German cockroach can survive a month or more without food, but less than two weeks without water.
- Never squash a yellow jacket wasp near the nest. A dying yellow jacket releases an alarm pheromone that alerts its comrades. In less than 15 seconds, yellow jackets within a 15-foot radius will rally to the victim's aid.
- The song of the field cricket is temperature dependent. The tone and tempo down with a drop in temperature. Count the chirps in 13 seconds, add 40, and you will have the approximate temperature in degrees Fahrenheit.
- The male cicada may be the loudest insect known. By vibrating the ribbed plates in a pair of amplifying cavities at the base of the abdomen, the mating sound of the cicada may be heard as far as 440 yards.
- The housefly can harbor more than 100 kinds of pathogenic organisms and may transmit more than 65 human and animal disease organisms.

Paul B. Baker
Acces-Pesticides
Pesticide Coordinator, U of A
Where did all the seedlings go?

You carefully planted the seeds for your fall garden. You watered and fertilized, and the seedlings emerged. However, just when you thought you had gotten a good start the new plants begin to disappear overnight. A good detective will suspect the following culprits.

Birds are likely suspects when the seedlings are pulled out of the ground. Because birds also eat insects, keep binoculars handy to make sure they are pulling plants and not removing caterpillars. You can keep birds away for a short time with loud noises, scarecrows, fake owls, and even aluminum pie pans on a string. Cover plants with floating row covers or, because birds like the smallest seedlings, start with bigger plants.

Cutworms are wily insects that feed at night and hide during the day under clods of dirt so you might be inclined to blame someone else for their work. Look for evidence that the plants were clipped off at the soil line. Go out at night with a flashlight or look under dirt clods during the day to locate the drab gray caterpillars. Place collars around the seedling to act as barriers. Spray plants with pesticides containing BT.

Darkling beetles are brown or black beetles about 1/3 of an inch long. Like cutworms, they chew off seedlings at the soil line. Darkling beetles can reach high numbers during the summer and are occasionally pests indoors. Pull all weeds, which is where the beetles breed.

Seedcorn maggot larvae look like housefly maggots, but feed on seeds or seedlings before they emerge from the soil. These tend to be more of a problem in cultivated crops where the seed row is well-marked. Level your beds as much as possible to keep the adult flies from finding the seeds.

Other insects and insect relatives have also been accused of damaging seedlings, sometimes warranted and sometimes not. The best strategy is to monitor your plants closely and don’t be afraid to question ALL the suspects.

All About Herbs: Bay

Sweet bay (Laurus nobilis) is a perennial herb which does well in the Valley provided it is given some protection from the sun in the summer.

The name suggests greatness. Sacred to Apollo, this plant was used to make a laurel crown for the victorious in classical times. When scholars receive their baccalaureate, they are winning “berries of the laurel.”

The botanical name for this plant is derived from the Latin, laurus, meaning bay tree and, nobilis, meaning renowned or notable. It is in the Lauraceae family which also includes camphor and cinnamon.

Bay leaves are flat, pointed ovals and are long, dark green and glossy. In ideal conditions the shrubby trees may grow to 25 feet tall. (There used to be a beautiful specimen on the grounds of the Camelback Inn growing under the canopy of larger trees). Some plants send out shoots from the base like the ones grown by the Arizona Herb Association in the herb beds surrounding the Extension Office demonstration garden.

Bay trees are very slow growing and like good, well-drained soil in a sunny, sheltered position. Pots or tubs are ideal containers. Planted in the ground they take about a year to establish a strong root system and may need to be shaded initially. Deep watering is best, but they don’t like their feet standing in water like a mint would.

Bay has many uses:

- Culinary: in soups, stews, roasts, sauces, casseroles, stocks and the list goes on and on. And, of course, it is a must in bouquet garni.

- Ornamental: Tussie-Mussies, wreathes, pot pourri, etc.

- Cosmetics: As a skin lotion, steep bay leaves in boiling water and add it to bath water.

- Other: Some people say that putting bay leaves in flours and grains prevent insects from getting started in canisters. This may be an old wives tale, but it doesn’t cost very much to try it.

Most of the nurseries that carry herbs in the Valley usually have bay plants, or they can be mail ordered through the usual catalogs, like Burpee or Park Seed Company. Good luck and good gardening!

Roberta Gibson
Research Specialist
U of A Ag Center

As the weather cools be prepared for the annual migration of insects seeking the warmth your home.

Carole Zajac
Master Gardener
The War Between Plants and Diseases

Part 1: What is a resistant plant?

For almost a hundred years, since scientists discovered that plant diseases were caused by other living organisms, they have been studying exactly how pathogens affect plants. A resistant plant is one that has strong defenses (natural or engineered) against disease. In particular, a resistant plant has one or more defenses to one or more attack weapons used by pathogens which enables it to prevent or overcome the infection.

Plants are a fabulous banquet of nutrients to plant pathogens (fungi, bacteria, insects, etc.), and they have evolved a myriad of ways to steal those nutrients from plants. These methods can be divided into two categories: mechanical and chemical. Many pathogens have hooks or produce sticky chemical substances to help their spores or seeds attach themselves to a host plant. Others produce body structures shaped to penetrate into the plant: fungi grow penetration pegs, shaped like nails, which they shove into plant tissues, while some insects and nematodes have a needle-like style to pierce plant cells and suck the juices.

Pathogens have also evolved an impressive arsenal of chemical weapons to attack plants. Some chemicals are digesters, which dissolve cell walls and other defenses, resulting in a "soft rot." Toxins (poisons) are also produced which kill plant cells outright. Other pathogens produce growth hormones which mimic normal plant hormones, causing the host plant to grow abnormally, resulting in galls and other tumors. Once the plant cells are damaged, the feast begins.

Obviously, plants are not helpless victims of pathogens. They have several lines of defense to protect themselves against the invaders. Plants have many structural defenses which act as walls or shields to prevent infection (like a thick cuticle or hairy surfaces) or prevent its spread by surrounding and isolating the invaders (corky layers, plugged vascular tubes, abscission layers). Many woody plants produce thick, sticky gums which enclose and suffocate the pathogen.

Hypersensitivity is a term used by pathologists to describe a reaction to invaders that many plants rely on. The individual cells of these plants are extremely sensitive to being attacked by pathogens, and die almost immediately. Infected cells and a surrounding ring of healthy cells all react in the same way, which then isolates the infection, preventing its spread.

Probably the most prevalent plant defense is chemical. Many defense chemicals are produced all the time in very low levels by a healthy plant, and production is increased during an invasion. These defense chemicals can be categorized into three groups. Toxins, like phytoalexins and tannins, are aimed at poisoning the invaders. Healers are chemicals that help plants repair the damage done by an infection. Neutralizers are chemical defenses that counteract pathogen chemical weapons.

To be resistant, a plant must have the appropriate defense reaction to a pathogen's weapon. Scientists have found this to be true on a genetic level: for each plant gene that provides defense, there is a corresponding pathogen gene which provides a weapon. Plants and diseases are locked into an ongoing arms race—and losing means extinction!

Sharyn Goodnight Hosier
Instructional Specialist,
Urban Horticulture

Designing Your Landscaping

Now that the weather is getting cooler it's a great time to start making improvements in the landscaping around your home. One of the ways to enhance your landscape is to develop a natural look that seems to fit into our desert surroundings and doesn't look man-made. Study the natural areas that surround us as well as the landscaped areas that look and feel natural and imitate what you see.

For better eye appeal, plant in groups of three or more with only one or two individual specimen plants that have contrasting shape, color, size or texture as a landscape feature. Avoid planting only one of every plant species you see at your local plant nursery. One of my favorite groupings is to use an ocotillo, a plant with great character, as a specimen and plant it with a number of golden barrel cacti. For a more natural look, avoid planting in a straight line or only in beds having flat elevations. Think of it—straight lines and flat elevations are rarely found in nature. To better mimic the natural environment, plant in shapes mirroring a lazy V, W, M, or other random pattern and mound beds to create height and interest.

PLANTING PATTERNS

![PLANTING PATTERNS](image)

LEGEND

- SPECIMEN
- OCOTILLO
- BOTTLE TREE

Daniel E. Rostock
Master Gardener

Figure 1
Judging Fruits and Vegetables

Fall is the season for a lot of county fairs and if you get a chance to get out it is worth the trip to visit them. Most last only a day or two but are in some wonderful locations. September fairs are in Globe, Pine, Young, Prescott, Douglas, St. Johns and Holbrook. Most of them are reminiscent of a different era. At the fairs the judging of fruits and vegetables is taken seriously and competition is sometimes fierce.

Standards for judging vary from judge to judge but for the most part the entries will be judged based on market standards. The entry should contain the right amount or number as set in the individual fair books. The entries should be in the correct class and lot and mis-entered entries are many times not judged. Example: the class is apples and the lot is Arkansas Black: entering the finest plate of Jonathans ever produced in this lot may get them disqualified. If you really do not know the name of the variety, most classes will have an open lot or an "any other named variety" lot that will accept them.

If the entries are in the right lot and are of market standard then care should be given to have the grouping of the fruits or vegetables be uniform. Remember these are entered for show and displaying is important. Judges usually don't judge critically for absolute ripeness unless its to break a tie, other factors in the preparation and displaying weigh heavier. But for heaven's sake if you enter at least wash them! It is aggravating to have stuff put on a plate and not even be washed. This rarely endears the entry to the judge.

Here are a few hints:
- Peppers all the same size and same number of shoulders.
- Apples are all the same size and color.
- Carrots are the same length and shape (don't try hiding green shoulders with crayons).
- Beans have the right number, same size and length and either leave the jointed stems on or remove all of them.
- Don't mix them up.
- Potatoes should not have any cuts or gouges.
- Stored beans or seeds should be from the correct season (I was suspicious at one fair that the same jar of Hopi red beans had been reentered year after year. So, I broke the seal and initialed the gasket and lip... then next year the same beans in the same unopened container appeared. They were not judged!)
- Tomatoes really need to be uniform in color, size and shape. Never put them stem end down if the shoulders have cracks—it seems like you are trying to hide something. Psychologically, a plate of tomatoes with cracked shoulders up win points with me, as if to say "go ahead, I have nothing to hide."

- Cherry tomatoes should always have one extra on the plate for a judge's treat (just kidding but a nice bite of a fresh tomato is a real treat.)
- Jars of dried goods (seeds, herbs, nuts and beans) are looked at for cleanliness, lack of dust, and dried enough to store appealing to the eye.
- Summer squashes should not be too big; winter squashes should be as big as possible with a uniform round color. There's nothing prettier than a large number of entries in the hubbards (green, gray and blue), banana, turban, butternut, buttocup, acorns (green, orange and white) and crenshaw squashes. If you never heard of some of these squashes you've got to go to a county fair.
- Prune plums should not have the blue dust removed (if you don't know what I'm talking about go to a county fair.)
- Cucumbers should have the spines left on for perfect classification, spine color is important, if you did not know that go to a county fair!

Terry H. Mikel
Extension Agent
Commercial Horticulture

White-lined sphinx caterpillars are on the loose!

Imagine you are a pest control operator and you get a call from the police at 11:00 P.M. Has there been an accident? Are you in trouble? No, there is a herd of caterpillars crawling across town. This scenario happened in Florence, Arizona last month.

The caterpillars are bright yellow to green with dark stripes running along their body. They are similar in shape and size to the more familiar tomato hornworm, with a spiky horn at the tail end. They feed on weeds such as purslane, the only landscape plants they will eat are four-o'clocks. Therefore, they more abundant in the outskirts of town rather than in urban areas.

White-lined sphinx are considered to be beneficial, but are definitely nuisance when found wandering in extremely high numbers. They may be killed by smashing or by common household insecticides.

Roberta Gibson
Research Specialist
U of A Ag Center
Where have all the whiteflies gone?
The clouds of sweet potato whiteflies which have become a fixture in the low desert areas of Arizona in the late summer and early fall have failed to make an appearance this year. New control methods in neighboring cotton fields are partially responsible for the lower numbers.

This spring, Arizona cotton growers received an emergency registration for two insecticides specific to sweet potato whiteflies. Both of these insecticides are insect growth regulators. In other words, both compounds interfere with the whitefly's development. Cotton growers put these new tools to use as part of an integrated pest management strategy developed by scientists at the University of Arizona. This strategy includes sampling whitefly nymphs and adults, spraying based on thresholds, making initial treatments with the insect growth regulators, and delaying use of broad spectrum insecticides in order to preserve beneficial insects. One or both of these insecticides were used to control whiteflies in the majority of Arizona cotton fields. Due to restrictions of the emergency registration, neither insecticide was used more than once in any field. This practice will help preserve the effectiveness of these insecticides for years to come by limiting selection for insecticide resistant whiteflies.

Experiments conducted at the U. of A. Maricopa Agricultural Center by IPM Specialist Peter Ellsworth and others have demonstrated that these insect growth regulators have been extremely effective in managing whitefly populations. In some of the 5 acre experimental plots, whitefly populations have been controlled to date with just one application of one of the insect growth regulators. While these insecticides spell death to whiteflies, they do not pose a threat to humans, wildlife, or even most other insects including beneficials. In fact, both have very low mammalian and avian toxicity.

The summer rains we have experienced this year may also play a role in keeping whitefly populations down. Heavy rains may knock both whitefly adults and nymphs off of plants. However, because large whitefly populations are present this year in cotton fields which have not received adequate control, the weather cannot be entirely responsible for low whitefly populations.

Lower whitefly numbers in cotton fields will result in fewer whiteflies migrating into urban areas and gardens when the cotton is defoliated in the fall.

Jon Diehl
Assistant in Extension, IPM
University of Arizona

Fall: A Time of Transition for Lawns
Warm season grasses such as common and hybrid bermuda, become dormant and lose their green color as temperatures decrease in the fall. Those of us who yearn for a greener lawn year round will want to overseed with a cool season grass such as annual rye, perennial rye, tall fescue or pine-fescue. Cooperative Extension publication 8652, "Overseeding Bermuda Grass" provides detailed information on soil preparation, seeding rates, watering frequency, mowing heights and fertilizing. Due to the thick turf and slow growth rate of zoysia grass, it is not recommended for overseeding. St. Augustine is not an overseeding candidate either.

If you're not going to overseed bermuda grass, then a light application of potassium is recommended in September. Bermuda grass will rest better during dormancy and will come out of dormancy with greater vigor. Watering should continue during dormancy at a rate of once per month if rainfall is not sufficient.

Fall is also a time that dormant bermuda sod, overseeded with a cool season grass can be installed. Care must be taken to never let the sod dry out. Start with light, frequent watering, then decrease watering intervals while increasing the watering time. Normal spring watering is required to establish good roots on the awakening bermuda grass.

The following Cooperative Extension publications provide useful information on turf grass and lawns:

Overseeding Bermuda Grass Publication 8652
Hybrid Bermuda Grass Lawns Publication 8752
Zoysia Grasses Publication 8387
Lawn and Turf Grass for Southern Arizona Publication MC 18

Danny Schnell
Master Gardener

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Lucy K. Bradley, Extension Agent, Urban Horticulture
Vegetable Gardening in the Fall

The good season for gardening has arrived again. I’m sure that after their summer, some of us wondered if we would make it until fall. Let’s go over the basics for a good vegetable garden since mainly most people are interested in raising their own good wholesome food.

You still have plenty of time to get your garden started so don’t rush into it. It is better if the soil temperature and the ambient temperature have dropped into the 90° range. I have found that gardening here in the Valley has changed a lot since our good friend the whitefly has arrived. It used to be that if you didn’t start planting by the first two weeks of September you were late. Now with our summer staying hot longer into late September and October and the peak whitefly season about the same time, the planting date can be set back into October and the first week of November and you can still have a very successful crop.

While you still have some time before planting, may I suggest that you check out the soil in your garden for its need of compost and fertility. What I am saying is that if you don’t have a good soil to put your seed into, you might as well leave the seed in the package. To find out about the soil’s condition is very simple. Just take a shovel and turn over some soil. If you don’t find any worms than you need to add compost. Worms and good soil just seem to go together. As you know, compost must be added each and every year at the rate of 4 to 6 inches. Seems like a lot, but to me you can’t add too much.

By the middle of October, many vegetables can be planted like beets, broccoli, cauliflower, peas, lettuce, etc. I have been asked by different people what is the best kind to plant. I say, whatever works for you! I’m serious, because different soils may raise a better crop of, say, Detroit Red beets than another soil. However, I will be glad to share what kinds work better for me and maybe you will have the same luck. Some suggestions:

- Detroit Red Beets
- Blue Lake Green Beans (both bush and pole types.)
- Red Sails and Green Ice Lettuce
- Copenhagen Cabbage
- De Coo Broccoli
- Snowball Cauliflower
- Sugar Ann for peas with an edible pod.

If I can be of any assistance call the East Valley Satellite Office at 357-9211.

Bill Hollenbeck
Master Gardener

Book Review

Quick and Easy Topiary and Green Sculpture by Jenny Hendy has prompted me to try topiary and green sculpture! It’s not really as complicated as I thought (in fact, it can be pretty easy). There are so many simple frames to be made out of common materials (such as coat hangers) and simple tools that really turned out surprisingly well. What a unique way to make a centerpiece or display or to decorate for a special occasion! This book shows completed works and how to achieve that look. After studying the section on outdoor topiary, you will probably exclaim, “I CAN do that!”

There are suggestions for plants that work especially well for topiary or green sculpture. There is also a list of suppliers. You will enjoy this book very much if you like working with plants or have any hint of art talent at all.

Quick and Easy Topiary and Green Sculpture is available wherever quality books are sold for $13.95.

Herb Mixtures and Spicy Blends introduced by Maggie Oster is just the kind of book that I like! It looks like a recipe book but the recipes are like none I have seen elsewhere—they are unique and just scream, “Try me!” There are wonderful vignettes in the margins on many pages of this book. Each tells of a restaurant where the recipe was developed or the herb farm where the herbs grew. Some stories are about special people.

There are herb blends for specific uses and those for multi-uses; there is a no-salt section for those inclined in that direction. Scattered throughout the book are little snippets of advice and hints and suggestions (just like treasures hidden here and there). A listing of the recipe contributors and the suppliers is included.

This is the book you need after you learn to grow your herbs and use some of them. It goes just a little further. You’ve got to have it! Herb Mixtures and Spicy Blends is $12.95 at fine book stores. Or, for both books, call or write: Storey Communications, Inc., P. O. Box 445, Pownal, Vermont 05261 1-800-441-5700, Dept. Y P.

Lenora Boner
Master Gardener

For more information on home gardening see the following Publications:

MC 84 Vegetable Planting Calendar
MC 4 Planting Guide for Vegetables
The Portable Broccoli

Short on space? Tired of tilling? Want more control over your growing environment? Yawn for something just simply easier? These are just a few of the many reasons to garden in containers!

Fall is a great time to begin (or continue, for you experienced container gardeners) your gardening in containers. If you have tomatoes, peppers, or other warm season plants that have survived the summer, cut hem back a third in September, and see them thrive with the warm days but cooler nights. When combined with your cool season plants, you will have the best of both worlds. A home-grown tomato in the same bowl as your home-grown lettuce!

What can I grow?

Plant for the seasons and choose short-season varieties of both warm and cool season crops. Plant seeds in September, or transplants in late September and October, or warm season vegetables, such as tomatoes, peppers, melons and squash. The goal is to harvest them before frosts. For your spring warm season garden, start seeds of warm season crops in November-January to transplant them by the end of February at the latest. The goal here is to get them into production before June.

Cool season crops will thrive now with the warm growing medium encouraging fast seed germination and root growth, and the cool nights keeping overall growing medium temperatures low enough for germination. With some care, seeds can be started (perhaps indoors for the first several weeks of growth) in September and transplants will be ready in October. Starting your own seed has many advantages, including a much greater variety to choose from, and choice of varieties recommended for containers not available as transplants in the nurseries. Typically, these varieties will remain smaller, or they'll have a bush habit instead of a vining one, or the fruits will be smaller. Successful sowings of cool season greens ensures a steady harvest of these crops.

Buy crops in October to transplant, if unable to start your own seeds. Many vegetables and herbs do well from transplants, including the cabbage family members. (Of course, tomatoes are notorious for taking transplanting very well.)

Gardening in containers has an advantage when staging crops for the seasons: you can maintain those warm season crops as long as they produce without having to dig them out to make space for cool season crops at the right time. Just add more containers to your garden, and start the next season’s crops. This can really get addictive, as plants can often go far into the next season successfully.

What type of container?

I advocate using larger containers, which help minimize the watering chores, and allow good root development. 5-gallon is the minimum size, and I really prefer the 10, 12, and 15 gallon or larger. While even a one gallon container will grow small crops such as herbs and scallions, the larger size supports the greater root ball of many vegetables, such as tomatoes, potatoes, peppers and broccoli, as well as holding a greater amount of moisture.

Containers should have large drainage holes (cover the drainage holes with small pieces of window screen to keep growing medium in and insects out of the container) and can be made of many materials. Inexpensive containers include black rubber nursery pots, fiber and plastic pots, even plastic buckets and large, wooden half-wiskey barrels. Clay, concrete and porcelain pots work well but are heavier and cost more in the recommended larger sizes.

What growing medium should I use?

The growing medium should contain either pumice or perlite, up to a third in volume, to help maintain excellent drainage. I have been using pumice recently, which provides excellent growing medium texture and drainage, doesn’t float away out of the pot, and even holds a little moisture (a real plus in summertime gardening.) The rest of the mix can be a good quality, commercial potting medium. The better quality brands contain a higher proportion of organic material (such as compost and shredded peat moss) that provide excellent support for the root system, as well as holding moisture for slow release to the medium. Water must be present in the mix, and should not pour through the container, leaving an almost dry medium. Add up to 1/3 in volume of shredded peat moss or matured compost if using a lower quality potting mix.

Food crops need 6 or more hours of sunlight a day, in winter, the location of choice may change during the season. Containers can be moved about easily to follow the sun, or can be moved to a protected area if a frost is expected or strong winter storms blow through.

Watering and fertilizing must be routine and consistent to keep plants actively growing. Remember, as the water flows out of the container, it takes soluble fertilizer with it. Several methods work, but watering with a balanced soluble fertilizer in a weak concentration (1–2 teaspoons per gallon, or as directed on the package) at least once a week assures a constant source of nutrients.

When harvesting your vegetables, do so gently so as not to break off branches, other fruits, or damage remaining crops. Enjoy!

Cheryl Caspickets
Master Gardener
Success With School Gardens

Have you thought about creating a school garden with your students but weren’t sure how to begin? *Success With School Gardens: How to Create a Learning Oasis in the Desert* will lead you every step of the way. This book contains everything a gardener needs to know to create a school garden in an arid climate. The book combines research-based horticultural information from the University of Arizona with the Master Gardeners’ experiences helping teachers and children with garden projects. Although focused on schools, the information applies to any youth or community gardening project.

You need to know only three things to run a successful school garden: 1) How to cultivate people, 2) How to cultivate plants, and 3) Where to go for help. *Success With School Gardens* covers each of these areas. There are references on school and desert gardening, names and addresses of seed suppliers, sources for educational and technical assistance, and opportunities for grants and other funding. Gardening assistance is provided with planting calendars and a chart to diagnose problems.

*Success With School Gardens* was written by Master Gardeners and University of Arizona Cooperative Extension personnel. It was designed to guide you through the important decisions in creating and managing a successful school garden, using research-based information presented in a user-friendly format.

Cost is $14.95, plus $2 shipping/handling per copy. To order, send a check or money order payable to Arizona Master Gardeners, Inc., 4341 E. Broadway Road, Box 149, Phoenix, AZ 85040-8807. Call 602/470-8086, ext. 312 for more information.

The Communicator is now available to the general public. It is published quarterly for an annual fee of $12.00. For more information about a subscription call 470-1556 and press 727. The next issue will be published in November.