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Attention Writers!

Please submit your articles for the July issue to: Kelly Obiadi at editorobiadi@gmail.com by July 15.

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There's no denying it - the long, hot days of summer are here. It's time to slow down and relax with a cool drink and start thinking about future garden projects when the outside temperatures inevitably start to come down. So, the team at Roots & Shoots is going to do just that.

The next edition Roots & Shoots will be a combined issue for July and August.

Contributors, please continue to submit your articles and photos as usual. To those who write recurring features (Volunteer of the Month, Veggie of the Month, Diggings, etc.) please contribute one article for July/August. The deadline to submit items for the combo issue is July 15th, but we ask that you DON'T WAIT until the deadline. We love receiving your pieces so send them to us early!

If you have ever considered being a contributor to Roots & Shoots, GO FOR IT! We are always looking for Master Gardeners to share their vast knowledge, varied interests, and unique perspectives. There's no commitment to writing each month and no experience is necessary. You can contribute whenever inspiration strikes. And remember, you can record your time spent toward your volunteer hours.

Submit your articles in Microsoft Word along with any photos to Kelly Obiadi at editorobiadi@gmail.com. The deadline is the 15th of each month for the upcoming month’s issue. We want to hear from you!
Have you been missing the monthly Master Gardener Updates?

It’s the program that occurs on the second Wednesday of each month (except July and December.) Not only are the presentations informative and inspiring, you get useful information about related Master Gardener volunteer hours!

May’s speaker was LoriAnne Barnett, a faculty member as well as the Education Coordinator for the USA National Phenology Network (www.usanpn.org.) Network members observe the timing of plant and animal phenology, or life cycle events, and their relationship to the environment. LoriAnne is actively engaged in gathering data about these changes in our local area and invites you to participate as a Master Gardener volunteer in the Nature’s Notebook Citizen and Professional Science Program (www.naturesnotebook.org.)

LoriAnne provided an overview of the Nature’s Notebook program, as well as the broader USA National Phenology Network, a US Geological Survey program housed at the University of Arizona. The goal of the Network, in addition to engaging people in gardening and nature, is to build a national phenology database to be used by homeowners, researchers, and managers to answer questions about how species’ phenology is responding to weather and climatic change from season to season, year to year, and in the long term.

Here are several links of interest from the presentation:

• The Power point shared during the lecture as well as answers to questions asked during the lecture

• Introductory materials (including videos)

• A link to a sample newsletter for the Southwest Season Trackers phenology campaign - our local campaign

• The plants and animals available for observation

• How data submitted to Nature’s Notebook are being used

• Education materials and curriculum for doing Citizen Science with K-12 audiences

• The Botany Primer: Understanding Botany for Nature’s Notebook.

You are welcome to view the website and the resources LoriAnne shared, as well as send any questions you may have to: lorianne@usanpn.org.

If you’d like to order a copy of The Botany Primer without having to pay shipping fees, please visit the link on the following page and provide your name, email address, and number of copies you’d like to order. Kelly Young and LoriAnne will be exchanging the books, so now is the time to request a hard copy ‘at cost’ ($11.89 instead of $24.99). Take a look at the primer online to decide if you’d like one.

We will be hosting an advanced training exclusively for the Master Gardeners sometime in September or October 2016. If you’d like to receive a separate email from LoriAnne to vote on the best date for the time and attend, also visit the link on the following page to indicate your interest.

The Master Gardener Update for the month of June will take place on June 8th from 9:00 am to noon at the Maricopa County Cooperative Extension offices.

We are pleased to have Dr. Tanya Quist, Director of the University of Arizona campus arboretum. She will be speaking about plant communication and other gardening topics.

There will be no MG Update for the month of July. Have a safe and happy 4th!
Please complete the Botany Primer request form and/or the advanced training request before 5pm on Friday, June 17th.

Botany Primer and Advanced Training Order Form

Here’s how Master Gardeners can get involved. You can observe and document the events in your own backyard, at the Extension Office, and at other locations across Arizona and the United States in Nature’s Notebook online at [https://www.usanpn.org/natures_notebook](https://www.usanpn.org/natures_notebook). Your participation is eligible for volunteer hours.

So, Master Gardeners, please try to attend the future Update programs. Watch your email for information on the June Update. Join us and experience the dynamic, exciting events and opportunities that are unfolding right here in our own backyard!

UPDATE TEAM MEMBERS ARE VERY MUCH NEEDED!

Assistance is needed with:

- Setting up the room before and restoring the room to its previous state after the program.
- Our audio-visual group, under the tutelage of Jenny Turner, also needs someone to help program speakers with the microphone and power point presentations. Jenny has provided a superb visual guide for anyone working on this team.
- We are looking for several volunteers to work on speaker support. Anticipated roles include writing articles about the MG Updates for Roots and Shoots, speaker support both before and after their presentation, and brainstorming to keep high quality programs coming to you!

Come on and join the team and earn volunteer hours! Please contact Olivette Aviso (omaviso1@gmail.com or 480-235-5989) with your interest.

We’re looking forward to working with you!
In case you missed it, the letter below was forwarded by Kelly Young back in January. It provides background information about this project:

Dear Friends of MCCE,

As we begin a new year, I wanted to take this opportunity to thank everyone who has helped with our landscape at MCCE over the years and update everyone on our new landscape initiative. As many of you know, we are beginning a renovation of our landscape, making our gardens more than a demonstration and showcase, but making them a living classroom. Working with industry partners like Ewing, the Arizona Nursery Association (ANA), Arizona Municipal Water Users Association (AMWUA) and Arizona Landscape Contractors Association (ALCA) to name a few, we will be revitalizing our trail, opening our entry way and renovating the landscape into a living classroom for our Master Gardener, Smartscape, and other classes offered by the Cooperative Extension and our partners. I have asked Rebecca Senior to lead this effort. She and I have been working closely with the MCCE Landscape Committee on developing a design. Phase I will be the north and eastern portions of the building. With the help of the ANA, we plan to plant a variety of fauna that supports AMWUA’s “Landscape Plants for the Arizona Desert” and the certification programs offered by ALCA and ANA. We also will be working to install a new irrigation system with demonstration zones where Smartscape attendees can see a working system with all the needed fittings and accessories. As we work through this renovation, I am asking that everyone coordinate any landscape activity (planting, pruning) on the North and Eastern sections with Rebecca (not including the Herb garden or MG vegetable garden). There is no sense in trimming a tree or bush if our plan is to move that plant. We hope to have Phase I completed by April 2016 and then we will move into Phase II, which will include the compound. I thank everyone in advance for their assistance as we transform our landscape into a living classroom. If you have any question, please contact Rebecca Senior at rsenior@email.arizona.edu.

**Doing something once is worth more than seeing it done a thousand times**

Edward C. Martin, Ph.D.
County Extension Director
Maricopa County Cooperative Extension
In the vegetable garden we are solarizing the soil in the south side garden beds. We have gardened intensively over a dozen years now and can certainly take advantage of the summer’s heat to refresh our soils. The less desirable colonies of soil organisms will be better managed and future crops should grow with renewed vigor. Planning for the summer garden has been challenging with only half as much space, but this project will make us more than ready for monsoon planting. *

A native passion flower vine is climbing one of our posts, and cardinal climber (Ipomoea sloteri) is wrapping itself up another. This season has been mild enough that they have bloomed nicely. Hyacinth beans (Dolichos lablab) have been planted to grow over the arch and the mouse melons (Melothria scabra) have wimped out. Oh well.

The heirloom Italian squash, ‘Trombetta di Albenga’, is going gangbusters. It’s a very prolific producer harvested as a summer squash or allowed to ripen into winter squash. The long necks produce lots of meaty, non-seedy slices of nutty sweet summer squash. What a fun plant. Such vigor! At least until the squash bugs arrive. At that point all summer squash vines are removed from the garden. It’s no great loss, as we have settled well into triple digit weather by then and do not expect much success with pollination. They have born us a great crop and do not owe us anything. On to the compost heap!

Sometimes in May it seems like all we do is watch and wait. We wait for the seeds of the long summer crops to sprout or to harvest tomatoes, summer squash, and cucumbers. We wait for the beans to climb the trellis, the potatoes to die back and the tops of the onions and garlic to fall over signaling harvest time. We wait for the compost to finish and fruit to ripen. But by June the waiting is over! We are harvesting stone fruit and tomatoes while the early summer crops are hitting their stride. Figs get sweet and soft by the end of the month and there are not enough hours to harvest and preserve. We make the most we can of the bounty because we know that the season is short.

High temperatures and dry afternoon breezes spell the end of this harvest mayhem! The tomatoes are splendid. Eggplant is settling in nicely and the interesting ornamental yet edible variety ‘Pumpkin on a Stick’ (Solanum integrifolium) are three feet tall and fruiting already. The most remarkable characteristic of this plant is not the leaf color or the fruit, both interesting, but check out those spines! Another attention-getter this season is the Angel’s Trumpet ‘Blackcurrant Swirl’ (Datura meteloides.) This is a pretty plant, not one for harvest, and it’s been several years since it has occupied a place in the garden.

The hollyhock seed factories were pretty and have been cut back. We should see shorter spikes all summer as they continue to bloom. The artichokes and cardoons have lovely flowers and the larkspur put on a great show following the poppies. A couple of carrots remain unharvested and allowed to bloom. We had great sources of pollen and nectar for the bees all throughout spring.

Don’t let your compost just sit, use it! Spreading compost as a mulch around summer crops is always good. Artichokes grown as perennials will go dormant until fall, so grow something large and leafy nearby to shade the crown and wait for September. Asparagus benefits from a monthly application of a nitrogen-rich fertilizer since all we are really growing are green leaves. Eat your purslane and harvest some of those interesting alternate greens to add nutrients and diversity to salads and other dishes.

Check out the sales in seed catalogs. Many varieties end up in the “going, going, gone” section this time of year as room is made for next year’s introductions. If you have space when those early summer crops expire, make room for black-eyed peas, okra, melons, sweet potatoes, Malabar spinach, cosmos, zinnias, and several flavors of basil or consider solarizing your soil.

See you in a garden!

*For more information on soil solarization, please visit:
http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74145.html
Each spring, fellow Master Gardeners Kathy Pyner, Diana Hawkinson, and I set off to a destination to see the countryside and seek out local gardens. We have visited Southern California, the Pacific Northwest, Canada, and several spots around our own beautiful state. These have become known as our “Another Pretty Flower Trips.” We usually plan well in advance for these adventures, but this year planning was put on the back burner while we focused our energy on the Real Gardens for Real People Tour. After the glow of the RGRP wore off, we realized if we were going to go somewhere, we’d better get busy. Several ideas for locations were bantered about, but nothing hit the right note. That was until Kathy suggested Tucson. Indeed, why not Tucson? It’s close, it’s affordable and they must have gardens we can visit.

The dates were selected and we booked a room at the venerable Arizona Inn. This historic inn is old school Arizona all the way. We could have spent our entire three days just moseying the beautiful grounds with tall shade trees, enjoying the perfectly manicured turf and flowers everywhere, or sitting on our private patio sipping wine and listening to the birds sing. As peaceful as that would have been, we were on a mission to visit Tucson’s gardens.

Our first stop was the Arizona-Sonora Desert Museum located just to the west of Tucson in Saguaro National Park. Founded in 1952, the 98-acre site includes a zoo, aquarium, botanical garden, natural history museum, and art gallery. We arrived early to avoid the heat and see all the animals. Apparently our idea of early and what a mountain lion considers to be early aren’t quite the same. Most of the creatures were already bedded down for the day when we arrived at 9:00 a.m., though we were fortunate to see a female Mexican wolf, a black bear, and a couple of bighorn lambs.

There are several areas of the park devoted to plants including the cactus garden, desert grasslands, pollination garden, and the native garden. The rest of the landscaping was left natural but groomed. Everywhere you looked there were lizards of a much larger variety than we commonly see here in the Phoenix area, sunning themselves on the rocks.

Our visit took place in mid-May after the palo verdes near our homes had already bloomed. However, because Tucson’s elevation is nearly 2,400 ft., compared to approximately 1,125 ft. in Phoenix, the palo verdes and penstemon were still in bloom. Also due to the higher elevation and cooler temperatures, Tucson gardeners are able to cultivate more varieties of penstemon. In addition to the Penstemon parryii and Penstemon eatoni common to our area, we also spied Penstemon barbatus, Penstemon pseudopetabilis, Penstemon palmeri, and Penstemon superbis.

Our three hour visit to the Arizona-Sonora Desert Museum also included visits to the aquarium, the reptile exhibit, the cave environment, and their impressive selection of books in the gift shop. After that, we were ready to relax back at the Arizona Inn.

Day two began at the Tucson Botanical Garden. Originally a private home on five and a half acres, the garden is nestled in the middle of the city about two miles from downtown Tucson. We were on the fence about whether to visit; it is located in a busy commercial area behind a Fry’s grocery store. It didn’t look like much, but we decided we had time to give it a quick look. And boy were we glad we did! This is a garden not to be missed. It was listed as one of America’s best secret gardens by Reader’s Digest for good reason. The Tucson Botanical Garden offers several vignettes including the Backyard Bird Garden – an enclosed pavilion featuring jays, cardinals, and roadrunners; the Butterfly Magic Pavilion – open seasonally and featuring beautiful butterflies, tropical plants and colorful frogs; as well as the Barrio Garden, xeriscape garden, cactus and succulent garden, and a welcoming shade garden. The staff was engaging and knowledgeable and the gift shop offered...
some unique items. If you go, don’t miss the artful tiles placed throughout the garden on benches, walls, and plaques. They do not have a reciprocal agreement for admission with our Desert Botanical Garden, but it was worth every bit of the $13 we paid to enjoy these lovely grounds.

After a traditional Sonoran lunch, we headed to the foothills in the northern part of the city to visit Tohono Chul Gardens. This 49-acre slice of the Sonoran Desert was named one of the world’s great botanical gardens by Travel and Leisure magazine. We decided this honor must have been given because the editor couldn’t find time to stop at the Desert Botanical Garden in Phoenix. Tohono Chul was interesting, but not as intimate as the Tucson Botanical Garden, nor as impressive as the Desert Botanical Garden in Phoenix.

After a day of traipsing through gardens, we returned to the lovely Arizona Inn and headed to the pool area to take advantage of the complimentary ice cream sundae bar… again. Yes, again. We’d already had our quota of ice cream for the month, but we figured that if we took a little walk we could earn another bowl, so we set out to see what surrounded the Arizona Inn and we were pleasantly surprised.

The Blenman Elm Historic Neighborhood is one square mile of architectural diversity. There are seventeen different styles of homes built during the 1920’s to the 1950’s. The area is credited with being one of the first ranch-style neighborhoods in Tucson.

The gardens in the Blenman Elm neighborhood were as diverse as the architecture. There were grassy lots with shade trees and window boxes of bold color as well as xeriscape gardens featuring spiky agaves, yucca, and cactus. There were fruit trees, palm trees, olive trees, palo verdes, oaks, and ash. No two homes or gardens were alike. The neighborhood walk was a treat and so was that ice cream sundae waiting for us at the end of the trail.

Day three and it was time to say goodbye to Tucson. We packed our bags, marveled at how lovely the weather had been, and chatted about all the interesting plants we had seen in the past 48 hours. After loading the car, we grabbed a delicious breakfast at The Blue Willow Café and set our sights north. But we had two more stops to make before we reached home.

The first stop on our return trip was Biosphere 2 in Oracle. Originally built between 1987 and 1991 to be a closed artificial ecosystem, Biosphere 2 was purchased by the University of Arizona in 2011 and now serves as a research, educational, and outreach facility that aims to further learn about earth, its living systems and its place in the universe. The structure contains five unique regions: rain forest, ocean, savannah, desert, and a coral reef. Air and water are self-contained so the researchers have the ability to manipulate the climates to make it rain in the desert or produce a drought on the savannah. Biosphere 2 is open daily for tours from 9 am – 4 pm. The 1.5 hour tour is $20 and worth every penny.

Last stop, Schnepf Farms for our annual day of peach picking. The farm is located in Queen Creek on Rittenhouse Road and is the largest producer of peaches in Arizona. All of the fruit is organic and free of pesticides. The first peach trees were planted 50 years ago and for the past 45 years the farm has been open for a limited time in May for the public to pick their own peaches. For more information check it out online at www.schnepffarms.com.

We drove home with the sweet smell of peaches and sweet memories of a few days touring our own beautiful state. It’s a trip I would recommend to all Master Gardeners!
Abiotic stress is defined as environmental conditions that reduce growth and yield to below optimal levels. The worldwide impact of abiotic stress on crops is significant. In 2007, the Food & Agriculture Organization of the United Nations reported that a mere 3.5% of the earth's land area was not affected by some sort of abiotic stress. Additionally, the United Nations predicts the world population to swell from 7 billion in 2013 to 9.6 billion by 2050, with global crop losses expected to increase. The United States is not immune to this problem as evidenced by the 2012 drought that affected 80% of our nation’s crop lands.

In order to adapt to abiotic stress, plants have developed certain biochemical and metabolic processes. One example of this is the use of calcium. In humans, calcium is important for bone health, blood clotting, communication between cells, and the contraction of muscles. Calcium plays a similar role in plants. When drought occurs there is an increase in calcium, causing water to flow out of cells, decreasing the turgor of guard cells, and closing the stomata to reduce transpiration. The closing of the stomata leads to reduced photosynthesis, thus slowing growth and impairing oxygen homeostasis.

More critical to a plant's ability to adapt are plant hormones, also known as phytohormones. They allow a plant to rapidly change its biochemistry and physiology in response to abiotic stress. An early lesson in the role phytohormones play in responding to abiotic stress came from the use of growth retardants. These compounds have been utilized in drought situations to reduce plant growth. They work primarily by inhibiting the phytohormone gibberellin. Gibberellin aids in the stimulation of cell division and elongation. When added to a growth-retarded plant the action is reversed.

In extreme temperatures plants will redirect resources to critical parts of a plant. Humans do much the same in that we allocate blood flow to those organs critical to survival such as the heart, lungs, and brain. One such phytohormone is salicylic acid. Used by humans for thousands of years to reduce pain and fever, salicylic acid helps improve plant tolerance to drought by enabling the plant to increase its height and reduce leaf wilt when added as a supplement.

Another example of phytohormones playing a role in drought is abscisic acid and cytokinin. Abscisic acid increases rapidly in response to drought and activates other signaling pathways. When your citrus tree roots are lacking water, cytokinin levels in
ABIOtic Stress and Plants... continued

roots, leaves, buds and shoot tips are reduced, but you see a significant rise in abscisic acid levels. Reduced cytokinin levels mean reduced growth of leaves, shoots and stems, all aiding in handling the reduced availability of water.

Master gardeners know that abiotic stresses such as temperature, drought, and salinity cause the greatest problems for the gardening public in our low desert. We live in an environment where improper irrigation practices may not be providing adequate water to the plant and can increase soil salinity. In response, plants either directly or indirectly modify the levels of phytohormones with a direct impact on seed development, seed germination, dormancy and overall plant growth. When discussing irrigation practices with the public, the importance of deep watering to reduce salinity in our alkaline soils needs to be explained. Salt-sensitive plants will find their leaves dying faster due to the accumulation of salt ions in the plant's tissues. With fewer leaves, calcium dioxide diffusion is reduced leading to a reduced photosynthesis rate.

Temperature extremes also have a significant impact on our gardening. Cold stress can cause a decrease in photosynthesis, necrosis, membrane damage, changes in cytoplasm viscosity, enzyme activation and finally death. In order to adapt, two phytohormones are known to play a role in helping plants acclimate to cold stress. When the biosynthesis of jasmonic acid and its signaling pathway is blocked, a plant is made hypersensitive to stress. Salicylic acid plays a role by modulating antioxidant enzymes. When jasmonic and salicylic acids were combined, the chilling injury to green bell peppers was reduced along with an increase in antioxidant levels. Ethylene, a phytohormone that causes the ripening of fruit, and jasmonic acid also work together to play a role in both cold and heat stress responses.

In our hot summers, plants that are adapted to the heat have a reduced photosynthesis rate. This has been demonstrated in tomatoes and rice, reminding us of the importance of shade cloth as temperatures rise. Moderate heat stress can actually improve photosynthesis mechanisms. It is interesting to note that heat seems to affect photosynthesis only at temperatures greater than 104 degrees Fahrenheit. Above this temperature you will also see significant changes in gene expression.

When trying to diagnose a problem that may be caused by abiotic stress, Master Gardeners need to remember that frequently no physical evidence may be found on the plant such as you would with biotic stressors. For example, you would not find aphids. Abiotic stress may or may not progress through an entire plant or move from plant to plant. Think about the sunburn occurring on citrus trees only on the south and west side of the tree. An entire species may be affected, such as a variety that is sensitive to salinity. To make an accurate diagnosis you need to know the plant and its biology. Finally, it is possible that both abiotic and biotic factors may be attacking the plant. An example would be a plant stressed by lack of irrigation leading to infestation of pests.

In our low desert we frequently face the combination of drought and heat. Our plants face a two-headed abiotic monster! The effect on a plant depends on the age of the plant, its level of stress resistance or susceptibility, and the severity of the stress. As Master Gardeners we get some of the same questions over and over again. “What can I grow in Maricopa County?” “Why can’t I grow my favorite flower or tree from Ohio?” We can point out that your favorite flower or tree is susceptible to our abiotic stresses, heat and drought, that is not seen in Ohio. Therefore we recommend an Angelita daisy or a palo verde tree. Imagine the problem that citrus has in July while only being watered to a depth of a few inches every day or once a month. Not being able to acclimatize to the combined stressors of heat and drought, the tree starts dropping leaves resulting in less photosynthesis. This can lead to the death of a newly planted citrus tree or severe damage to an established tree while exposing it to an increased susceptibility to pests and disease.

As more research is conducted in the area of phytohormones, signaling, and cross-talk between hormones, horticulturists may be able to identify targets that would improve stress tolerance in plants that we grow in our home gardens as well as for crops to feed the world. As Master Gardeners, knowledge of phytohormones provide the background as to why we make the recommendations that we do to the public.
Bibliography


As an Arizona gardener I don’t deal much with mud and don’t own a pair of rubber boots, so I can’t imagine gardening in the low country of South Carolina where water meanders through the landscape nearly everywhere. Yet when I learned of the Audubon Swamp Garden, I knew I needed to wander through it. I was assured by Christopher at the garden’s ticket window that we would be walking on a raised wooden walkway, safe and protected from alligators. After several hours of winding my way through the Swamp Garden on small boardwalks spanning the muddy places and navigating around the protruding tree roots, I wasn’t sure that Christopher had ever set foot in the garden.

The garden is a waterscape of cattails, water iris, swamp smartweed, water lilies, and sticktight sunflowers. The water dominates; some blue, some green. The green water is covered in duckweed that grows so uniformly it looks like a lawn. There are bald cypress trees with their roots rising out of the water like knobby knees. The “knees” are textured bark which ring round the tree. Orange azaleas grow among the pink magnolia and dogwood trees.

Also in the garden are palmetto trees, which look much like Mexican fan palms to me. Palmettos are an important part of South Carolina’s history.
During the revolutionary war, trunks of palmettos were laid onto the sand walls of the fort on Sullivan's Island and proved so strong it withstood an onslaught of British cannonballs. Today South Carolina is known as the Palmetto State.

The Audubon Swamp Garden is also a wildlife sanctuary. There are water birds, birds of prey, turtles, marsh rabbits, bull frogs, and of course, alligators. I was told that South Carolina has 42 varieties of snakes, though I didn’t meet any. At one point I wondered why would anyone want to be anywhere near a swamp. Then it occurred to me that, for the wildlife that call the swamp home, that is exactly the point. The animals and birds are quite happy here without people, t-shirt shops, or fast food restaurants.

It’s springtime and the animals are mating. The rookery was aflutter with white ibis and great egrets as well as snowy egrets. The birds were flying in with sticks and reeds to build their nests and fishing as they walked in the swamp. The great egrets have a bright yellow bill, green patch around the eye, and plume feathers that they fluff out to dry. Their beautiful plumage was once so popular for adorning women’s hats that the birds nearly became extinct.

There are platforms designed for turtles and alligators to re-energize themselves by sunbathing. In the daytime the gators like to lounge in the sun and the turtles climb up right alongside of them. Our guide on the river tour at Magnolia Plantation and Garden says the alligator is at the top of the food chain and there is nothing their jaws can’t chew. The hard shell of the turtle would be no problem for an alligator, but gators eat mainly at night and, unlike we humans, when gators are full they don’t eat again until they are hungry. What I would like to know is how does the turtle know when the alligator is going to be hungry? I learned later that alligators are usually sluggish in the daytime and are not likely to be a danger if left alone.

A swamp garden is a unique experience, unlike any other garden I have visited. While I’d call this an unusual garden, I realize that Arizona gardens of cacti, succulents and the occasional rattlesnake may be seen as unusual by those visiting from the Palmetto State.

Linda Larson is an advocate for the importance of public green space and the value of nature in our lives. She writes as “A Traveling Gardener, wandering, wondering, noticing...” http://travellinggardener.com/wordpress/

She is a lifelong lover of flowers, Master Gardener, and gardener in Mesa, AZ for over 30 years. One of her earliest memories is of daffodils lining the small stone path to her grandmother’s door. Personally visiting hundreds of gardens in many parts of the world, she shares her insight and discoveries entertaining readers and audiences.
GREEN BEANS: Vegetable of the Month for June

written by NATALIE GAGNON

This versatile veggie has many names: common bean, string bean, field bean, flageolet bean, French bean, garden bean, haricot bean, pop bean, and green bean. Whatever you call it, this herbaceous annual is a member of the Fabaceae (legume) family - collectively known as Phaseolus vulgaris. The green bean is grown for its edible dry seed (beans) and unripe fruit (green beans). A notable aspect of beans is that most of them get their nitrogen through an association with soil bacteria of the genus Rhizobium that live in the root nodules of the bean plant.

The wild bean is native to the Americas and along with squash and maize, is one of the “three sisters” central to indigenous North American agriculture. China is by far the #1-ranked producer of green beans in the world with the United States coming at #15. Wisconsin is the top green bean producer in the U.S. with North Dakota being the top producer of dry beans.

A warm season crop, green beans come in two basic types: bush and pole. Bush beans form compact plants 1 to 2 feet in height, while pole beans produce vines that may reach 8 to 10 feet in length. Pole beans require the placement of a trellis for support before the plants begin to produce runners. Pods of either type may have strings or be stringless and they may be round or flat in shape. While green is the most common color, pods may be yellow (wax beans), purple, or streaked.

Green beans grow best in well-drained, loamy soil and in full sun. They are sensitive to cold and even a slight frost can cause damage. For this reason the first planting should not be made until after the danger of the last killing frost in spring. Green beans need a continuous supply of moisture, especially during pod set and pod development.

Potential disease problems include seed rot, damping-off, bacterial blights, rust, anthracnose, and viruses. Pests include aphids, Mexican bean beetles, spider mites, and leafhoppers. Monitoring your garden pest populations will help you determine how best to deal with them, but try to stay organic with food plants as you will be eating whatever has been sprayed onto your crop.

When harvesting, green beans are picked at an immature stage when the seeds inside have not yet fully developed. Snap or cut the firm, large pods off the plant, being careful not to tear the plant. Green beans can be stored in a moisture-proof, airtight container in the refrigerator for up to four days or they can be blanched and frozen immediately after harvesting. They can also be canned or pickled.
For a simple side dish, you can’t beat this recipe for seasoned green beans from Annette of Glendale, Arizona on AllRecipes.com. It’s a snap to prepare!

Lemon Pepper Green Beans

Makes 6 (1/2 cup) servings at 81 calories per serving.
Time: 25 minutes.

**Ingredients:**

1 pound fresh green beans, rinsed and trimmed
2 tablespoons butter
1/4 cup sliced almonds
2 teaspoons lemon pepper

**Directions:**

1. Place green beans in a steamer over 1 inch of boiling water. Cover and cook until tender but still firm, about ten minutes; drain.


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