Arthur Temple College of Forestry and Agriculture
STEPHEN F. AUSTIN STATE UNIVERSITY

SFA Gardens *News*

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Notes from the Director

By Dave Creech

Since the last notes in June, I've planted my footsteps and given talks in Maine, Pennsylvania, Tennessee, Florida and China. It's great to be home for a nice, long stretch. "No one realizes how beautiful it is to travel until he comes home and rests his head on an old and familiar pillow." – Lin Yutang.

Janet Creech, professor Yin Yunlong, Dr. David Creech, and foresters Wu Xiaohong and Liu Jiang stand on the bank of the Three Gorges Lake in China.

A three-week China adventure in August took me to Chongqing and Three Gorges Lake with my friend and colleague Professor Yin Yunlong. It was there that we jumped in a water taxi to see up close an incredible project to reforest the edges of this mountain-framed lake.

Each year, Three Gorges Lake experiences a more than 100-feet elevation change in the high-to-low-level water mark. Thus, the siltation issues are intense. With that as a major problem for the long-term health of the lake, a fascinating experiment to create a forest from the high-level mark to 40-feet below the high-level mark with *Taxodium* was instituted in 2006. It's a success.

Imagine trees planted in the fall, then going underwater beginning in November and emerging from the gloom in late April or early May. The trees go dormant under water, survive and then leaf out when the lake waters recede and sunlight is provided. It's worked since 2006.

As is my penchant, let me complain about Texas weather. After a wet month of May, Tropical Depression Bill forced Lanana out of its banks on June 18, 2015, and made a big mess here in the garden. Then, as if on cue, Mother Nature decided to turn the faucet off.

We've had a little more than four inches of rain in the last four months. Greg Grant and I can't decide if trees are heading into dormancy or an early grave. Now, we're facing the aftermath of Hurricane Patricia's blast on the West Coast of Mexico, which has rolled into Texas dumping several feet of rain on our parched lands. Such is Texas; it's feast or famine.

So, what's on our plate? Well, we're adding a muscadine grape vineyard in the Jimmy Hinds Park and expanding the kiwi test plots near Starr Avenue. With 56 varieties of muscadine grapes in our inventory and some kiwis in one-gallon containers ready and waiting in the nursery, stay tuned. We've got two new rows added to the half moon blueberry planting at the Pineywoods Native Plant Center. Dawn Stover has dozens of new mums to add to the trials at the Gayla Mize Garden. We're brimming with new plants, and they soon will be finding a home at the Pineywoods Native Plant Center, Mast Arboretum, Ruby Mize Garden and Gayla Mize Garden.

Finally, it is with more

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than a little sadness, I report that Barb Stump has retired. I can't tell you how much we will miss her; me most of all. Out of habit, I still find myself thinking she's here to answer a budget question, pull a plant map or run an idea by. Also, we have learned that Brock Vinson is moving on. Brock has been a go-to guy on so many of our projects. We will miss him, too. Read the book, "Ordeal of Change" by Eric Hoffer, which has been the story of this garden's life. Until next time, let's keep planting.

The Story of the Maroon Bluebonnet

By Greg Grant

A few folks at the University of Texas at Austin caused a big stir about the different-colored bluebonnets that appeared on campus several springs ago. It turns out, it wasn't a prank after all. Heck, the scattered flowers weren't even maroon. I know maroon bluebonnets because I helped develop them with Dr. Jerry Parsons years ago when I lived in San Antonio. Here's how it happened.

In 1985-86, I was in graduate school at Texas A&M University studying horticulture. Meanwhile, in San Antonio, Dr. Jerry Parsons was working on a bluebonnet colorization project to plant a Texas flag for the state sesquicentennial comprised of red, white and blue bluebonnets. The idea for the project was the brainchild of the late and legendary Texas wildflower enthusiast Carroll Abbott known to many as Mr. Bluebonnet. He approached Dr. Parsons concerning the idea with only a few years to get it done.

Like most Texans, Dr. Parsons didn't realize bluebonnets existed in any color but blue. Carroll Abbott assured him that if one looked long and hard enough, a few white bluebonnets could be found. And, if one had the time and desire and looked even harder, a very few light pinks could be found. Jerry was assigned the task of finding these natural colors in the wild, collecting the seeds, growing them, rouging out the off colors, selecting the improved colors, replanting each year, stabilizing the colors and bulking up the seeds all in a few years time. It was an impossible task. But, my dear friend Jerry is as stubborn as a mule and has a love affair with the impossible.

To Jerry's credit, he managed to find and isolate both white and pale pink bluebonnets before the flag planting. Unfortunately, red petunias had to be used in place of red bluebonnets, as it would take another 25 years for those pale pink bluebonnets to be gradually coaxed into red. Jerry selected natural colors from the wild and isolated them, letting pollinators cross pollinate within his color selections.

In this process of selecting bluebonnet colors, Jerry developed a method to increase germination, and with the help of volunteer farmers, he showed that bluebonnet seed could be produced as a commercial crop. This dropped the erratic price of bluebonnet seed to something reasonable and more stable each year. And, working with a local bedding plant producer, he showed the world that bluebonnets could be grown, sold and planted as transplants. These were all revolutionary developments, as the prevailing thought at the time was that bluebonnets could not be grown without inoculating with beneficial rhizobium bacteria and could not be transplanted. It turns out that simple fertilization replaced the need for the nitrogen-fixing bacteria.

When I went to work in extension with Dr. Parsons and he found I was born in love with bluebonnets, he immediately put me to work on the project. Jerry wasn't good with colors, so my main job was identifying the best red candidates in the pink plots and pulling up the others. I had never pulled up a bluebonnet in my life, but in my five years in San Antonio, I managed to pull up thousands.

Eventually, the small patch of developmental pinks was moved to a large production field in La Pryor, south of San Antonio. One day while going through the field, there happened to be a few plants that had a mixture of

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both blue and pink in the flower. Technically, they were shades of lilac and mauve and not even attractive. But, I remember being so excited, as I explained to Jerry that we could take those seeds and actually develop maroon! We could make the challenge from Texas A&M a reality. I told Jerry, all we had to do was combine blue and red to make purple and then combine purple and red to make maroon. I naively made it sound so simple.

The problem is for every color selected and developed there had to be a completely isolated field for both development and production; otherwise they would all gradually revert back to blues. There also had to be somebody like me to pull out the unwanted colors; otherwise gardeners would purchase seed that had off-type colors and end up with beds that looked like those on the UT campus.

I eventually moved back to East Texas while a "retired" Dr. Parsons still works on bluebonnets colors. The Alamo Fire selection that is sold by Wildseed Farms in Fredericksburg actually came out of the red strain of bluebonnets, not the maroon. Jerry is currently working on a darker blue and something he wants to call purple, but I'd call it indigo right now. If I lived in San Antonio, we'd whip it into an SFA purple! You can read Dr. Parsons' version of this whole bluebonnet colorization project by searching for "bluebonnets" at plantanswers.com.

Golden Kiwi

By Dave Creech

As part of a trialing agreement, our original golden kiwi vines, *Actinidia chinensis*, came to us in November 2010, via Dr. Jay Spiers from Auburn University. They were planted in 2011, and our first crop in 2014 resulted in 144 pounds of nice, golden kiwis from six Golden Dragon vines.

In September 2015, we harvested 875 pounds from about that same square footage, which works out to about 20 tons an acre. The general consensus was that the fruits' quality was good. More than 60 participants were given a bag of fruit and a survey form. On a 0-to-10 scale (0 = I'll never eat one again and 10 = fantastic), the crop scored 8.84.

While not the final verdict but with two consecutive crops, there's now some room for optimism that we can produce kiwis in Texas.

Kiwis are male or female. We have three female varieties: AU Golden Dragon, AU Golden Sunshine and Au Fitzgerald, coupled with three males: CK3, Tiger and AU Authur. One male for every four-to-six females is considered sufficient.

AU Golden Dragon has been the high performer at SFA, however, we do have vine-health issues. Some vines suddenly wilt and die back—some all the way to the ground and then typically re-emerge from the crown with very vigorous suckers. The cause is undetermined.

We still have much to learn, but we know that drainage is important, and the kiwis need a strong arbor. We are still learning about the best-plant spacing and pruning and fertilization schedules, and best placement of the male pollinator plants.

Mackenzie Richburg and Brock Vinson pick a bumper crop of kiwi from the SFA collection.

Our plants are own rooted, and there's some evidence that grafting on *Actinidia decliciosa* may help with diseases. The kiwis can ripen on the kitchen table, but soften very quickly. We are excited to be working with colleagues at Texas A&M University as well. In the next few years, we'll know if kiwis are an exciting new fruit for Texas or not.

I'm convinced there's a potential bigger opportunity available; one that capitalizes on mass markets and wholesale/retail nurseries to supply plants to homeowners.

The plant roots easily and grows very fast, so it's all about timing the crop to hit the market at the right time. Plants can quickly outgrow a container. The fact that you need a male and a female plant to make fruit does complicate things. So, I dreamed up a colorful six-pack idea, perhaps four females and two males in a bundle. Think fancy point-of-purchase promotion and a cheerful fact sheet hanger on each, add an easy-to-grab handle and you're ready for market in spring. I think it's a brilliant idea, however, others might think otherwise.

Buzz about Bumblebees

By Dawn Stover

Pollinator is a huge buzzword these days. So big that we even have a presidential memorandum creating a "Strategy to Promote the Health of Honeybees and Other Pollinators." While the media places heavy focus on monarch butterflies and honeybees, the real workhorses in our pollinating community are benefiting from the buzz as well. Interestingly, honeybees are not native to North America and merely supplement pollination of our native bees. Additionally, there are vegetables and fruits that rely significantly, if not solely, on wild bees instead of honeybees. So, it behooves us to promote the health of these "other pollinators." Honeybee colony collapse disorder is truly a big issue, but the plight of our native bees is much more cause for concern.

There are 3,999 bee species native to North America, and their decline in the past 100 years is devastating. Most of our natives are solitary, ground-nesting species that do not sting. People are quick to point the finger at neonicotinoid pesticides, but that's like slapping a bandage on a gaping wound. The larger picture almost exclusively involves habitat loss and fragmentation – whether from large, mono-crop farms or urbanization. The solution lies in habitat restoration, both big and large scale. Farmers can help and benefit by leaving buffer zones with native plants and grasses around fields. Urban residents can create pocket prairies and encourage local parks and businesses to do the same.

Let's take a look at a few things you can do in your own landscape to encourage populations of native bees. First, remember that most native bees are stingless and while there are a select few equipped with stingers, they are all quite docile and much more interested in nectar than in stinging you. Beyond that, eliminate pesticide use, use native plants and provide habitat. Three pretty simple steps, don't you think?

An American bumblebee nectars on a 'Zowie Yellow Flame' zinnia at the Mast Arboretum.

Bees and butterflies are extremely sensitive to pesticides. The best defense is an offense, and creating a habitat beneficial to pollinators also will, over time, encourage natural predators like ladybugs, lacewings and praying mantis. In the short-term, try mechanical control first. Remove larger insects by hand and drop in a bucket of soapy water. A simple blast of water from the garden hose will help control aphids and spider mites. If an outbreak requires more intervention, choose contact insecticides, like insecticidal soap, that literally suffocate the soft-bodied pests it comes in contact with.

If you choose to use something more toxic, follow the label directions to the letter, and only apply exactly where needed. There is an acute incident that set off our "neonic" finger-pointing, occurring when an Oregon landscaper treated aphids on trees in a large, retail parking lot. The label on the pesticide clearly stated that application would cause death to bees if sprayed on blooming plants. Guess what? The trees were in bloom, and an estimated 50,000 honeybee and bumblebee carcasses littered a busy, retail parking lot. Read and follow the directions on the label, folks.

Native plants and pollinators have evolved together over time to create a mutually beneficial relationship. Just as the plant provides the service of nectar and pollen production that feeds pollinators, pollinators transfer pollen amongst flowers ensuring seed for the next generation. While some bees, like bumblebees, are generalists in that they rely on a succession of plants throughout the season, others are specialists and nectar on and pollinate less than a handful of floral families. They are only active for a short time in the growing season.

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Buzz, *cont.*

Cucurbits (squash) are native to the Americas, and the squash bees are fine tuned to the daily rhythm of their flowers. By the time honeybees get around to visiting cucurbit flowers, the flowers are past their prime, as squash bees have already nectared and pollinated when the flowers opened early in the morning. And what about those generalist bumblebees? They are buzz pollinators. The vibration from the buzzing releases pollen. Tomatoes and blueberries, both native to the New World, are exclusively buzz pollinated and in no way benefit from honeybees. In turn, native plants provide richer nectar and bloom times that benefit native bee populations.

We often only concern ourselves with the pretty flowers that attract pollinators, but we should be equally aware of the things we can do to facilitate habitat as well.

First, consider the different types of bees and their individual habitat needs. Ground nesting bees need a maintained bare patch of Earth in the landscape. Look for perfectly round holes in bare ground, and you can bet there's a female ground bee nest there.

I must mention that ground-nesting bees are NOT the same as what many people call ground bees. The latter are in fact wasps that form underground colonies and will aggressively defend their territory. Ground nesting bees are solitary and are quite docile. Tunneling bees, like carpenter or mason bees, need stumps or snags to tunnel in or plants with pithy stems like blackberries in which to nest and lay eggs. You can get creative and create nesting blocks that are attractive garden additions as well as habitat for bees that might otherwise choose to tunnel in wooden structures around your house. Bumblebees prefer to nest in warm, dark areas like those provided by native grasses from spent foliage that is left after winter.

Providing the right resources to encourage pollinators in your garden is pretty easy and quite rewarding. Spend some time watching the habits of native bees. They are fascinating little creatures. Then, join me in the Million Pollinator Garden Challenge by creating your own pretty habitat that encourages ALL of our native pollinators. Visit millionpollinatorgardens.org to register your habitat.

Barb Stump Retires

By Dave Creech

When Barb Stump said she was thinking of retiring, I told her, "I'm sorry, I won't allow it." Well, that didn't work. She retired at the end of August and now we're Barbless.

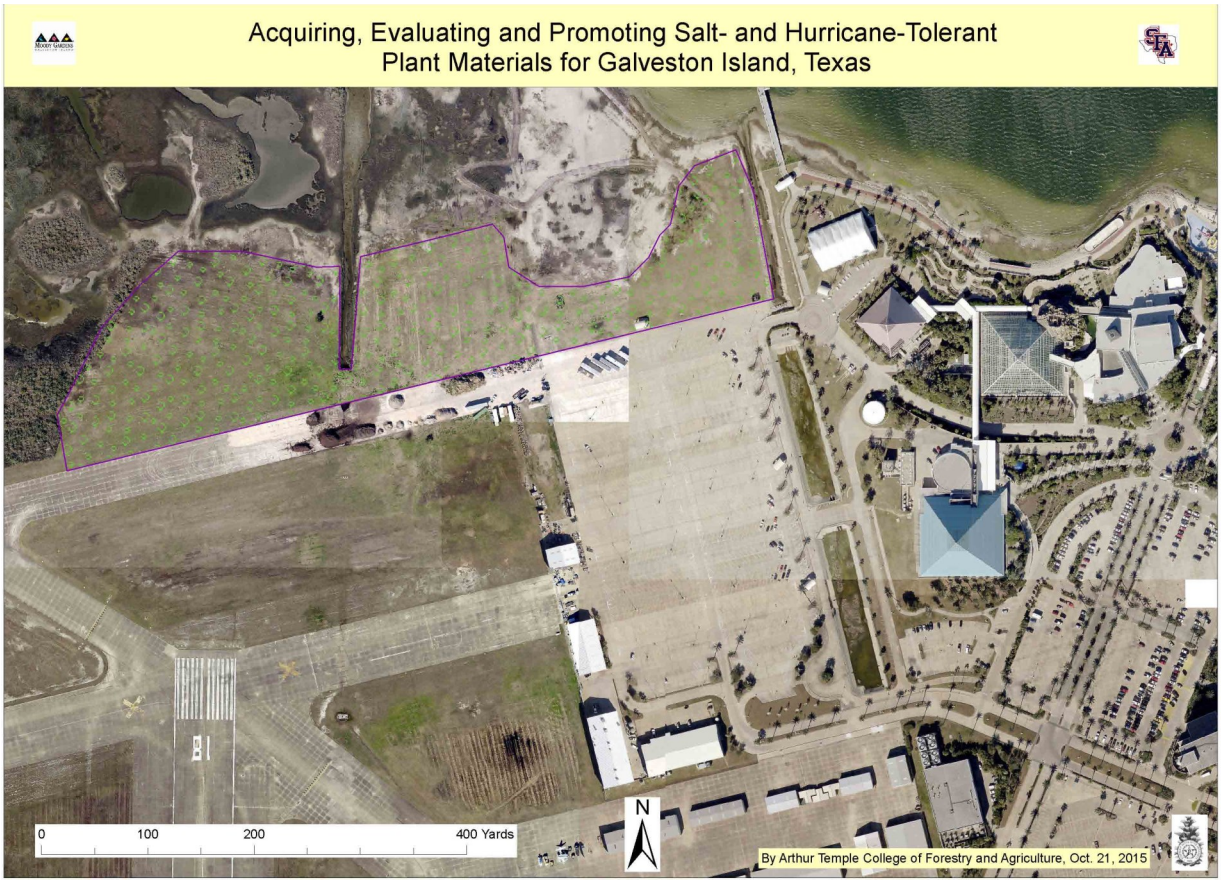
She first arrived at SFA in 1997 with an interest in working toward her master's degree. Since we were just beginning to think and plan for an azalea garden across the creek from the Mast Arboretum, I asked what she thought about a "design" thesis. She liked the idea, and Barb began a very long adventure. About a year into the program, Dottie Wisely stepped in with an endowment to make it happen, and when I first got the news, I asked Barb if she would like to change her thesis title to, "The Design and Construction of the Ruby Mize Azalea Garden." The rest is history.

How many graduate students actually have a living, breathing success story like that for a thesis? It's no secret that Barb wore many hats here. She handled SFA Gardens' complicated accounting, secured plants, and kept the garden connected with the Azalea Society of America, nurserymen, and plant enthusiasts. We will miss her. She'll always be nearby, and she'll be volunteering for all kinds of things at SFA Gardens. However, she was quick to point out that when I ask her to do something, she now has the right to say, "Let me think about it. No."

Moody Gardens Update

By Dave Creech

To date, Dr. David Creech, director of the SFA Gardens, and Brock Vinson, SFA Gardens technician, have been accumulating ornamental plant materials with salt tolerance potential. Dr. Creech is working with a network of colleagues, nurserymen and plant enthusiasts across the South. Drs. Yanli Zhang, Dave Kulhavy and Dan Unger, professors of forestry, are responsible for developing the GIS platform for the site. Dr. Ken Farrish, director of the Division of Environmental Science, and Elaine Harris, graduate research assistant, will be studying the impact of raised beds, mulch and gypsum on growth and survival of three ornamental plants. Dr. Michael Maurer, professor of horticulture, and Rebecca Burnett, graduate research assistant, are delving into the impact of aerial salts on foliage of ornamental plants. Dr. Stephen Wagner, professor of biology, and Elaine Fowler, graduate research assistant, will be studying mycorrhizal and bacterial associations of native and exotic vegetation and their impact on salinity tolerance. Dr. Young, director of the SFA Soil, Plant and Tissue Testing Laboratory, is in charge of soil, water and plant tissue analysis. Dr. Zheng, a visiting scientist from China, is working with Dr. Bea Clack, professor of biology, to determine genetic markers associated with salt tolerance in *Taxodium*, and will be adding another salt-related research project in the spring. The research plots are being created near the spillover parking lot at Moody Gardens, adjacent to Offatts Bayou. The first plantings will begin this December. The plots are only 4 to 5 feet above sea level, and several acres are involved in this high visibility spot. It will be designed in rows to accommodate various graduate research studies, and the project will expand over the entire acreage throughout the next three years. A UV-Resistant PVC sign will mark the spot and will include the SFA and Moody Gardens logos. A recently added side project with Moody Gardens staff members is to make contributions to a nature walk and arboretum along Galveston Bay that will highlight native plant vegetation.



Fall, Field Trips, Family Fun and Fishing

By Elyce Rodewald

Cool nights, warm days, beautiful colors in the landscape and the voices of children in the garden—it must be fall. Fourth graders from Nacogdoches ISD are visiting the Pineywoods Native Plant Center this month to go "Wild About Science." The students participate in four hands-on activities to learn about real-life activities and tools scientists use. They have the opportunity to measure the diameter of trees, practice using a compass, investigate the water quality of the marsh and collect data on camouflaged worms. The lessons are correlated to state-mandated science curriculum and help to translate information learned in the classroom into meaningful experiences. However, the students probably don't realize that. They just enjoy a fun fall day out of the classroom.

The Outdoor Family Fun Day in October introduced the community to great outdoor activities. The student chapter of the National Association of Interpreters hosted geocaching, outdoor cooking, leaf crafts, and taught visitors how to cast a line with Backyard Bass. The students also tempted us with tasty treats at their bake sale. In addition, the students helped us learn "how not to die in the woods," introduced Leave No Trace principles, led nature hikes and shared information about wildlife tracks. The Pineywoods Audubon Society encouraged families to notice the abundant bird life at the Native Plant Center with playful birding games. SFA Gardens staff members and volunteers acquainted visitors with the basics of using a bow and arrow on the archery range.

Students from the Nacogdoches Boys and Girls Club have returned to the Nacogdoches Naturally after-school program with enthusiasm. They have explored the forest and adopted a tree, learned about Leave No Trace principles and had their first fishing and canoeing adventure at Lake Naconiche. These children visit the Pineywoods Native Plant Center weekly during the school year and are led by SFA Gardens staff members, student workers, community volunteers and interns from the SFA Arthur Temple College of Forestry and Agriculture.

Geocaching is an excellent way to combine technology with outdoor adventures.

A'raiya Edwards, Kelsey Brawner, SFA education major, and Kayla Reeves learn patience at their recent visit to Lake Naconiche with the Nacogdoches Naturally after-school program. The mood was cheerful even though the fish were not biting!

Measuring the catch and learning about bag limits is a favorite part of the backyard bass fishing activity.

Above and below: Nacogdoches ISD fourth graders use math, science and special tools to collect data and solve real-world problems on their "Wild About Science" learning excursion.

Come grow with us!

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The Azaleas of Nacogdoches

By Elyce Rodewald

Barbara Stump recently retired from SFA Gardens after 18 years of dedicated service. She designed the Ruby M. Mize Garden as a graduate student and helped to develop the garden as a research associate. The garden is a beautiful and lasting legacy for SFA and the Nacogdoches community.

We are excited that Barb decided to share her love and knowledge of azaleas as well as Nacogdoches history by writing, "The Azaleas of Nacogdoches." This lovely book will be available through SFA Press beginning Dec. 1, 2015. The cost is $35. To order your copy, email sfapress@sfasu.edu.