



SFA Gardens NEWS

Notes from the Director

By Dr. David Creech

Spending three weeks in New Zealand was a highlight of the spring for me. For a week, we studied the kiwifruit industry (Greens, *Actinidia deliciosa*, and the Golds, *A. chinensis*). Our Texas team included our Texas A&M University research colleagues, Tim Hartmann and Justin Scheiner, and some potential Texas investors. Tim and I are co-partners in a kiwifruit research project funded by a Texas Department of Agriculture Specialty Crops grant. In three to five years, we'll know if kiwifruit is a commercial crop for Texas, a candidate for homeowner gardens or one of those deals we should avoid at all costs. Our goal is simple: Discover the horticulture strategies needed for reliable crops in several Texas regions. We have much to learn.

Our band of eight visited half a dozen kiwifruit farms, toured the Seeka packing plant and received a fine primer on the New Zealand kiwifruit operations. It was an eye opener. A few years ago, all I could've told you about kiwifruit in New Zealand was that it was a big deal. Today, the country is moving about 36 percent of the world's supply. If you want to grow kiwifruit commercially in New Zealand, you have to be part of Zespri, a "single

desk" growing, packing and marketing platform. There are more than 2,500 growers who are part of this "club." The high price of land, the high cost of a license and the potential high returns were surprising. You have to give kiwifruit high marks for an aggressive production and marketing program, success in increasing worldwide consumption, and a supply system that really works well.

Our focus for the week was The Bay of Plenty region, the epicenter of the kiwifruit growing in New Zealand, which lies on the west side of the North Island, principally Katikati, Te Puke, Tauranga and Opotiki. This area produces more than 75 percent of the New Zealand crop. Kiwifruit exports from the country amount to more than \$1.5 billion, a figure that has been increasing every year for the past five years.

Since 2010, the big excitement has been recovering from the devastating effects of a bacterial canker disease specific to kiwifruit, *Pseudomonas syringae* *pv. actinidiae* (termed *Psa*). Once the disease had a

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foothold in this production region, it spread rapidly and was devastating for a time to New Zealand's kiwifruit industry. A change in varieties, rootstocks and cultural practices has brought the disease level down to manageable. Psa has been found in a number of countries, including Italy, Japan, South Korea and Chile. There is no current cure for the disease. Most importantly, the disease has not been found in North America.

The new gold kiwifruit is seeing the most acreage expansion. From what we learned, almost 10,000 acres have been licensed for the new gold kiwifruit cultivar, Gold3, and millions of trays will be in the pipeline. This new cultivar was speedily launched into commerce in response to identification of Psa in 2010 and is now seen as a cornerstone in the Psa recovery picture. Gold kiwifruit are thin skinned, generally a little sweeter and rapidly gaining popularity.

The vacation part of our trip was Janet and I driving around the South Island for two weeks in a rental car. "Stay left! Stay left!" That's the shout Janet perfected for me. We vacationed at a gentle pace and stopped at five great gardens. We took a train, touched a glacier, meandered in the bays on a steamer, marveled at glowworms and sauntered in the ancient Kauri forest



in the northern reaches of the North Island. Janet and I touched the Lord of the Forest Kauri tree with our nose and forehead in a hongii, the traditional Māori greeting. I return inspired by the botany, climate, strong fruit production base, a vigorous ornamental nursery industry and citizens who really love to garden. If you're thinking of immigrating to New Zealand, stand in line. A young person with talent can get in. An old person with talent needs money. Drat.

The cheerfulness of New Zealand surprised me. Everyone we met was extremely friendly, relaxed and seemed to enjoy a fine command of the English language. Good cheer



Golden Kiwifruit in New Zealand can yield more than 20 tons per acre using best-management practices. The Seeka factory, pictured above, can pack more than a million trays of kiwifruit per week during the peak harvest season.

was the norm. I checked on this and discovered New Zealand is one of those "happiest countries" you read about. If you garden or farm for decades, you understand the idea that there's such a thing as too much cheeriness. Sure, be positive about what you've accomplished, but don't become too content. There's more to do. For SFA Gardens, I decided it's really quite simple. We just need to keep planting until we get it right.

Moody Gardens Project Update

By Dr. David Creech



For the past 18 months, SFA Gardens has been working on a project funded by the Moody Foundation at Moody Gardens in Galveston. We couldn't have found ourselves in a more challenging environment. Our research plots are at the west end of Moody Gardens and north of and adjacent to the airport.

Our footprint is about two acres, and we're using a nursery row strategy. Everything is drip irrigated. Most of the plant materials are planted on a mild berm measuring from

1-to-6 inches in height and about 4 feet wide. Bark has been tilled in, and we use mulching, herbicides and base-of-plant hand weeding to keep the weeds at bay. We have a fertilization philosophy that leans to light applications infrequently. The plots are 4 inches above sea level and a couple hundred feet to the bay. Two feet down and you are in high-salt soil, which means trees and shrubs have to accept the thin band of decent soil as their home or leave. Only the most aerial and soil-salt-

tolerant plants have much of a long-term chance of survival. The never-ending wind is a challenge. Everything wants to lean north. Branches on the south side of a tree trunk find themselves soon growing to the south.

Our latest inventory reveals more than 260 woody plants attempting to thrive or survive in this tough landscape. Most accessions contain three to five of each plant. Of course, many of the palms, both commodity and rare, are performing well. Our own *Prunus* X 'Purple Pride' seems cheerful.

Leucophyllum langmaniae 'Lynn's Legacy' is keeping excellent form and seems to bloom all the time. Our pomegranate varieties are thriving. *Hibiscus dasycalyx*, the Neches River rosemallow, is an endangered plant with which we have much experience. It's surprisingly strong in our plots with great flowering, no salt damage and seems unaffected by the sawfly, a problem in its home further north. I'm not sure why the latter is true. Perhaps the sawfly was blown north. The hybrid *Taxodium* selections chosen for salt tolerance via the Nanjing Botanical Garden are growing well, but the wind is the big challenge for tree form and structure. Several poplars via the University of Florida have been surprises with fast growth and unaffected foliage.

The Mexico oaks are losing the battle to aerial salt. *Parrotia persica*, the Persian witchhazel, looks to be a goner. As candidates fall, they are being replaced with new plant materials for testing. Most importantly, this grant is creating a long-term platform for evaluating plants in a windy and salt-challenged landscape.

Malcolm Turner is the technician in charge of this project on the ground. He's doing a great job making things happen, and I have renewed confidence that the maintenance is covered. Danny Carson, Moody Gardens horticulturist, and Donita Brannon, Moody Gardens horticultural exhibit manager, have

been great to work with. Sabino Bilon of Moody Gardens has taken a personal interest in the project and has been a great help.

In addition to plant evaluation, the project has allowed other collaborative research projects. Dr. Hua Jianfeng, our visiting scientist from Nanjing Botanical Garden, is testing the use of *Hibiscus hamabo* as a rootstock for *Hibiscus syriacus*, Rose of Sharon. Will using the salt-tolerant *hamabo* allow the popular Rose of Sharon to grow in a more salt-challenged environment? For her master's degree, Elaine Harris, a graduate research assistant under the direction of Dr. Kenneth Farrish, director of SFA's Division of Environmental Science, is analyzing data from a project titled, "Soil Amelioration and Plant Establishment on Sodium Affected Soils on Galveston Island, Texas." This study tests the impact of raised beds, gypsum and mulch on the growth and health of three species: live oak, bald cypress and *H. hamabo*.

Elaine Fowler has completed her master's degree under the direction of Dr. Stephen Wagner, SFA biology professor, with her thesis, "Assessment and Characterization of Microbial Communities in Salt-Affected Soil on Galveston Island." It's great to have Steve and Josephine Taylor on the project since both have talents that will allow us to understand the nuances of microbial impact on salt tolerance in plants. We have several

projects in the works with Dr. Ed Bush, associate professor at Louisiana State University, thanks to a recent study he oversaw. Bush supervised a study with Anna Koonce, a high school student from Louisiana, who won second in the Intel International Science and Engineering Fair with a paper titled, "The Effect of Sodium Chloride on Hybrid *Taxodium* Selections." Anna previously won the state competition in Louisiana. Results indicate the *Taxodium* hybrids were more salt tolerant than native bald cypress.

I've come to love our Moody Gardens project. Everyone I've met on the island is quick to let me know we're one hurricane away from a disaster. But this is Galveston, and the islanders know that. Our project is not for the timid. It's an effort that can help us gain a better understanding of how to deal with plants in a challenging environment. Finding climate-change-friendly plants and better strategies to grow them is indeed a noble cause.



Clockwise from top: *Hibiscus hamabo*, SFA's *Prunus* X 'Purple Pride' and *Leucophyllum langmaniae* 'Lynn's Legacy' brave the challenging environment in Galveston.

Conservation Education Program Reels in Fun during Angler Activities

By Elyce Rodewald

SFA Gardens' conservation education program encompasses many topics, including earth science, natural history, native ecosystems, pollination, endangered species, vegetable gardening and forest health, to name a few. About 10 years ago, fishing and angler education eased into our summer camp curriculum with encouragement from a volunteer who was an avid angler.

I was hesitant at first. It sounded a bit scary with hooks on long strings, children close to the water and fish with spiky fins. Our eager volunteer offered many sound suggestions for safety protocol and contributed ideas and techniques for teaching children the basics of successful fishing.

I soon realized fishing was not just about the fish. Fishing also was about sharing a passion for being outdoors and caring for a special place. It was about patience, dexterity and spending time with friends. It was about unplugging from the television and gaming devices to see nature up close and personal. It was about



relaxing, being quiet, persevering, rejoicing in your successes and coping with disappointment. And of course, it was always about the fish stories.

With help from a Texas Parks and Wildlife Community Outdoor Outreach Program grant, we purchased fishing gear and expanded angler education into our weekend family and afterschool programs.

Recently, several SFA forestry majors, who participate in the student

chapter of the National Association of Interpreters, completed the Texas Parks and Wildlife Department's angler education course. They immediately put their new knowledge to work by bringing the Junior Angler Certification program to Kid Fish, a large family fishing event hosted by the City of Nacogdoches. SFA students used the angler education curriculum to create six hands-on, experiential learning stations. Participants who completed all six stations received a Junior Angler Certificate.

SFA students gained valuable experience in developing and teaching the activities. The children at Kid Fish benefited from the interactive and effective stations. I realized once again fishing isn't just about the fish. It is about excitement, learning, sharing, building a community, and who could forget the fish stories.

Visiting Scientists Returning Home Soon

By Dr. Jianfeng Hua

My wife, Qian, and I are extremely grateful to Dr. Creech for inviting us to study and work as visiting scholars in the U.S. and at SFA. Although there were some adjustments at the beginning of our studies, everything is going well now thanks to the people of America. As time passes, we have become familiar with life in and around Nacogdoches. We are amazed by the natural forests, blue skies, nice people and free-roaming animals here, which we don't see living in a large city in China.

As part of my field experiment at Moody Gardens in Galveston, I am working on research focusing on the effects of salt stress on the growth and mineral composition of grafted *Hibiscus syriacus* with the help of my advisor, Dr. Creech. My wife, who has been working in the Soil, Plant and Water Analysis Lab at SFA, has been working on finding appropriate extraction methods for chloride. She has collected samples of corn straws, barley spikes, azaleas and pine needles from the



Dr. Jianfeng Hua



Dr. Qian Jiang Hua

experimental fields and gardens at SFA and rice from a local store. She expects to build appropriate extraction methods for chloride in these different samples. Meanwhile, water from a creek and soil from North American Proficiency Testing Program (2016) were used to determine the concentrations of selenium, boron and sulfur in the samples. It will definitely be helpful to figure out why we encountered test problems such as less stability, high blank and more uncertainty in the testing process back in our lab in China.

Our time in Nacogdoches has been

a good experience for our son, Junwei Hua (Joey), who attended Raguet Elementary School during the 2016-17 school year. Now, he can speak good English and has made close friends in the community. He received awards such as “Most Improved Student” and “Star Art Student” while attending Raguet. We are most appreciative and thankful for his teacher’s time and the extra effort she made with Joey. Joey also attended Wonder Woods Camp in June at the Pineywoods Native Plant Center, where he enjoyed songs, games, art projects, hiking and hands-on nature

activities.

In addition to trips to Houston, Corpus Christi and Disney World in Florida, we also visited Caddo Lake, an internationally protected wetland under the Ramsar Convention, which includes one of the largest flooded cypress forests in the U.S. The beautiful view in and around the lake amazed us. The visit will definitely be helpful in my research projects on bald cypress trees when I return to China. In late August, Qian, Joey and I will return home with many new ideas, memories and friends made during our visit to America!

Letting Nature Take Its Course

By Dawn Stover

We’re planning and planting for pollinators at the PNPC. We’re working diligently to incorporate more nectar and larval food sources into the landscape around the Brundrett Conservation Education Building and the Tucker House in an effort to immerse our visitors in more of the natural world. Since spring, I have noticed a dramatic uptick in populations of at least two species of longhorn bee and have seen leaf cutter bees for the first time. Those beautiful, metallic green sweat bees are more plentiful, and we’ve seen more American bumblebees. Often in life, there comes the bad with the good, and with plants, there’s no exception. Plants are adept at attracting insect pests as well as our cherished pollinators.

A little insect explanation may be in order. The definition of a garden insect pest is loose at best, and the gardener can best explain what an insect pest is for his own garden. It boils down to “economic” impact and how much cosmetic or catastrophic damage we are willing to tolerate. We are less tolerant of pests in the vegetable patch simply because we want to harvest those fresh, unblemished vegetables. On the other hand, we plant specific plants knowing that insects will eat them to the ground. For example, we plant milkweed to specifically entice monarch caterpillars to devour them. We are willing to tolerate that type of damage, so the monarch is not considered a pest. When we start talking about beneficial



Milkweed is planted to entice monarch caterpillars to eat them; however, Milkweed attracts predators and aphids as shown above.

insects, several categories arise: pollinators, predators and parasitoids. Pollinators need no introduction; we all love fresh tomatoes, squash, melons and such, and we know without pollinators, our plates would be nearly empty. Predatory insects eat other insects. If predatory insects are eating pest insects, that’s a good thing. Parasitoids are insects that lay eggs inside other insects and the subsequent parasitoid larva eat the bad insect from the inside out. Gruesome and fascinating all at once, right?

The hottest ticket in pollinator plants these days is milkweed. It’s a great nectar source for a variety of pollinators, and it’s the larval host plant for the beloved monarch butterfly caterpillar. Anyone who has grown

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milkweed knows you'll be growing plenty of bright orange pests, known as oleander aphids, as well. They are habitual milkweed and oleander pests and can cover a plant in no time. Additionally, they exude honeydew, which turns into a sticky black mess on stems and leaves.

When faced with a garden pest, our first inclination is to eradicate them with any means necessary. Pesticides are often the first line of defense, but they kill beneficial insects, including monarch butterfly and larvae and predatory insects, in addition to the targeted pest. Blasting aphids with a heavy stream of water or using insecticidal soap are both kinder alternatives, but either method has the potential to unintentionally target

microscopic monarch eggs or larva. If sprayed on hot and sunny days, insecticidal soaps, even homemade versions, can lead to phytotoxicity in plants. Given that we have plenty hot and sunny days, this option may do more harm than good.

In our war on pests, the easiest option is to simply do nothing. Well, nothing besides planting a variety of plant material that beneficial insects utilize to supplement their diet of harmful insects. Both predatory and parasitoid insects will find nectar on flowers and feed on pollen when the population of pest insects on their proverbial buffet runs low. With this in mind, after incorporating a plethora of milkweed with more nectar and pollen-producing plants and then

experiencing a massive oleander aphid population explosion, we just sat back and watched.

We watched the lady beetles move in, their eggs hatch and larva grow. We watched the numbers of aphid mummies grow as the parasitic wasps moved in. We watched syrphid flies hover and cheered when we found their larva crawling amongst the aphids. We simply watched the aphids disappear.

I realize the populations of both pest and beneficial insects will rise and fall, but my suspicions lead me to believe we'll achieve a happy balance in which the aphids will be mostly managed. And mostly is good enough for me if we have zero pesticide use and plenty of well-fed butterflies and caterpillars.

● Permaculture Design 101 with Theron Beaudreau

● By Jocelyn Moore



Theron Beaudreau

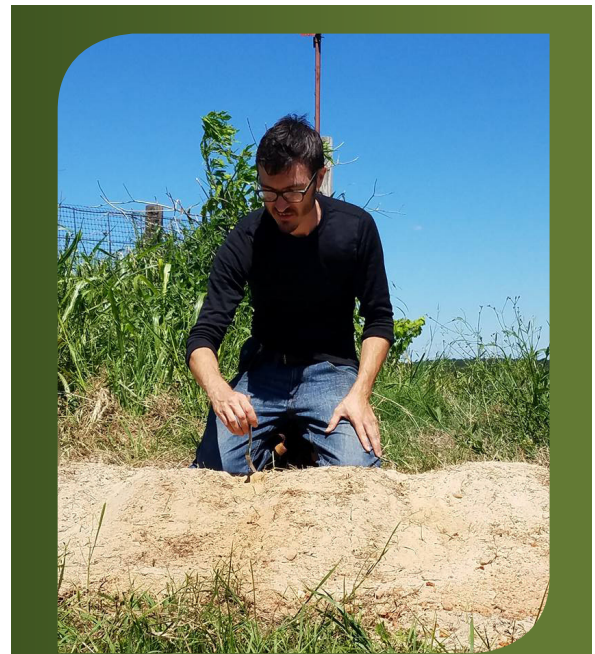
Theron Beaudreau, owner of Integrated Acres, instructor and design consultant, will discuss holistic design strategies for East Texas that regenerate the land and surrounding ecosystems from 9 a.m. to noon Saturday, Aug. 26, at the Brundrett Conservation Education Building in the PNPC. He

also will share his perspective and strategies for permaculture.

"Permaculture design focuses on the relationships between elements in the garden and how we, as gardeners and designers, can arrange these elements for the most efficient and least maintenance gardens," Beaudreau said.

Gardeners can benefit from hearing Beaudreau's design methods, which include having an abundant harvest with minimal weeding and watering.

Beaudreau studied with Geoff Lawton at the Permaculture Research Institute of Australia and has a wealth of knowledge. With a passion for education, Beaudreau also hosts seminars and in-depth trainings for the Texas Forest Country and surrounding bioregions. Through monthly weekend workshops, he has taught important topics ranging from water harvesting to soil building.



The seminar costs \$15 for SFA Gardens members and \$20 for non-members.

A question-and-answer session will follow.

Meet Our Newest Team Member

By Dawn Stover



Jordan Cunningham

and shoulders above the rest. Our own horticulture alumna, Jordan Cunningham, is our newest team member.

Jordan grew up in Waxahachie and moved to Nacogdoches to pursue a degree in horticulture at SFA. Upon graduation, Jordan began working as an area supervisor at the Dallas Arboretum, but her heart was still in Nacogdoches where her then-fiancé, Mark, lived and worked. After marrying in June 2016, Jordan returned to make a home with Mark in Nacogdoches. As luck would have it, she was looking for a job,

We have regrouped and restructured our staff to meet changing needs and budgets. While we had several good applicants for our SFA Gardens greenhouse technician, one applicant stood head

and we were looking for a dynamic new addition to our team.

Her personal goals for the position fit well with the job description: to grow more plants for our fundraising plant sales and contract grow opportunities. Her greatest passion in horticulture closely mirrors mine in that we both savor successful propagation of plants and watching the things we create grow into living, beautiful things. Jordan and I make a good team, and she is the constant in the greenhouse when additional projects pull me in different directions.

Jordan has already put her organizational skills to work getting the PNPC head house in order. She has helped find a place for items as we work to consolidate tools and equipment from the agriculture head house with those in the PNPC head house. Jordan runs a tight ship and keeps our crew in line. In the short time she's been with us, Jordan has begun the first big contract grow by germinating and transplanting 4,500 kiwifruit seedlings.

We can't wait to see where this next chapter leads us and for the growing opportunities ahead.

Upcoming Events



JULY 13: THERESA AND LES REEVES LECTURE SERIES

Learn what Greg Grant has been up to since his departure from SFA Gardens in his lecture "A Bright Spot in the Heart of Tyler — The Idea Garden."



AUG. 10: THERESA AND LES REEVES LECTURE SERIES

Hear Jenny Cruse Sanders, vice president of science and conservation at the Atlanta Botanical Garden, discuss "The Greater Atlanta Pollinator Partnership."



SEPT. 14: THERESA AND LES REEVES LECTURE SERIES

Enjoy George Hull, horticulturist from Portland, Oregon, as he presents "From Over the Top to Down Under, Adventures in Horticulture."

Lecture series events listed above will begin at 7 p.m. in the Brundrett Conservation Education Building. Lectures are free. A drawing for plants from SFA Gardens will follow.



SEPT. 23: BIOBLITZ AT THE PNPC

Team up with volunteer scientists, families, students, teachers and community members from 6 a.m. to 10 p.m. at the PNPC to find as many species of plants, animals, microbes, fungi and other organisms as possible. This family-friendly event will feature hands-on activities and games.



SEPT. 30: KIWIS IN EAST TEXAS

Discover how to grow tropical fruits in East Texas from 9 a.m. to noon in the Brundrett Conservation Education Building as Dr. David Creech, SFA Gardens director, shares the latest in care, culture and selection of kiwis gleaned from the kiwi trials at SFA Gardens. The event costs \$15 for SFA Gardens members and \$20 for non-members.

For more information, call (936) 468-4129, or email sfagardens@sfasu.edu.



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*“To nurture a garden is to feed not just the body,
but the soul.”*

– Alfred Austin

