

LOUISIANA Agriculture

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ENSURING OUR FUTURE THROUGH SCIENTIFIC
RESEARCH AND EDUCATION

THE BOUNTY OF THE BAYOU STATE:

Growing Fruits and Pecans

SUPPORTING THE DIVERSE ARRAY OF FRUITS AND NUTS IN LOUISIANA

■ MICHAEL POLOZOLA

Welcome to this special edition of Louisiana Agriculture magazine, where we delve into the LSU AgCenter's dedicated efforts to enhance and support fruit and pecan production across our great state. Our overarching goal is to successfully foster home fruit production and support the fruit and pecan industry in Louisiana. Through our research and extension programs, we aim to provide homeowners and commercial growers with the knowledge, resources and support needed to cultivate a diverse array of fruit crops. This edition highlights our commitment to these goals through various initiatives and success stories.

Our journey begins with the pecan industry, a cornerstone of Louisiana agriculture. The quest for superior low-input pecan cultivars has led to the identification of promising varieties like Manda and Woodman, which offer resilience and productivity with minimal maintenance. These efforts are crucial for ensuring the sustainability and economic viability of pecan production in Louisiana.

Next, we turn our attention to blackberries. The Trellised Production Using Primocane Suppression (TPUPS) technique is revolutionizing blackberry cultivation by simplifying harvesting and reducing disease pressure. This method shows promising results with cultivars like Kiowa and Ponca, paving the way for more efficient and sustainable blackberry farming.

Our exploration continues with strawberries, highlighting the search

for the best strawberry varieties for home gardeners. Cultivars like Mara des Bois and Charlotte offer exceptional flavor and resilience, making them ideal for Louisiana's climate and providing gardeners with a rewarding experience.

The fig breeding program at the LSU AgCenter has a rich history. Since the 1950s, the program has developed fig cultivars suited for the Gulf South region, such as LSU Purple and LSU Gold. Recently, a donation of fig trees has enabled the establishment of a new planting at the AgCenter Dean Lee Research and Extension Center, further supporting fig cultivation in Louisiana.

We also celebrate the mayhaw, a native berry with a unique flavor and cultural heritage. The history and significance of mayhaws are highlighted along with the efforts of growers in developing superior cultivars. The renewed interest in mayhaws is driving growth in this niche industry, which is supported by initiatives to increase the availability of mayhaw trees.

Our agents also explore the historical records of apple cultivation in Louisiana and the potential reintroduction of heirloom Southern apple varieties. We are actively searching old homesteads for old varieties and grafting trees from them to offer better, tastier heirloom apple options for modern home orchards.

This edition also features a blueberry variety demonstration, which showcases the performance of different blueberry varieties in our climate. The demonstration provides valuable insights into yield data and ripening times, helping

gardeners and farmers make informed decisions. Additionally, we touch on the renewed interest in pawpaws and the proactive management of strawberry diseases, reflecting our comprehensive approach to supporting diverse fruit crops in Louisiana.

As we celebrate the diversity and richness of Louisiana's fruit industry, I invite you to explore these articles and discover the innovative techniques, resilient cultivars and passionate individuals driving our state's agricultural success. Together, we can ensure a fruitful future for Louisiana by fostering home fruit production and supporting our vibrant fruit industry.

Michael Polozola, the AgCenter Extension fruit and nut specialist, is stationed at the AgCenter Dean Lee Research and Extension Center in Alexandria.



Michael Polozola poses with a blackberry vine at the LSU AgCenter Dean Lee Research and Extension Center in Alexandria. Photo by Sara Shields

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ON THE COVER: A pecan grows on a Woodman pecan tree in Pointe Coupee Parish. The Woodman pecan is a variety that requires fewer inputs and thrives in many areas of the state. Photo by Kyle Peveto

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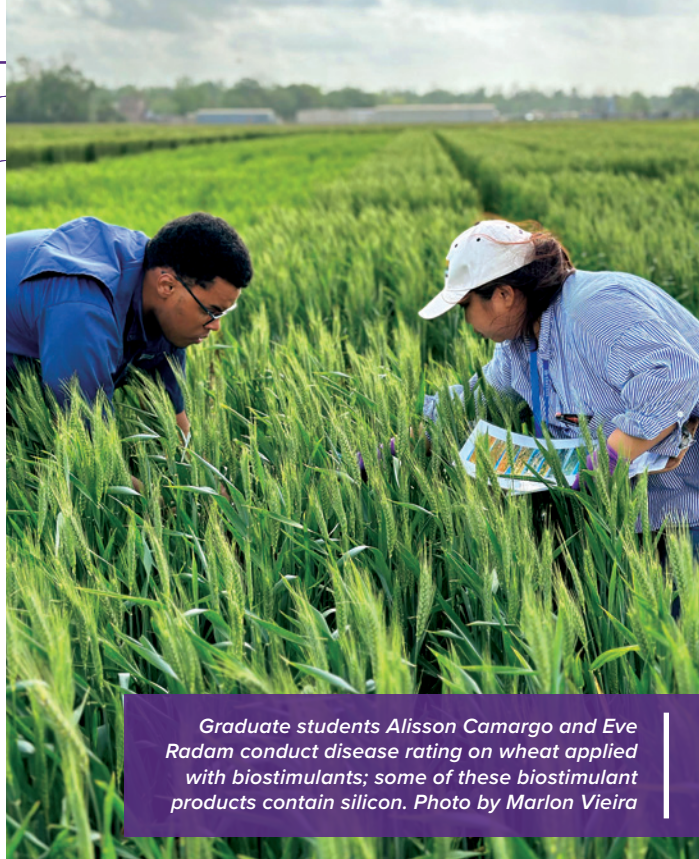


TWO LSU AGCENTER PROFESSORS RECOGNIZED FOR SIGNIFICANT PAPER ON SILICON

In 2021, LSU AgCenter researchers Lawrence Datnoff and Brenda Tubaña published a paper analyzing the role silicon plays in plant stress reduction and why the element is not used as a fertilizer in agricultural production. Since its publication in the *Plant Disease* journal, the paper has been downloaded more than 11,000 times and has been cited 45 times.

The paper, titled “Silicon’s Role in Plant Stress Reduction and Why This Element Is Not Used Routinely for Managing Plant Health,” was written with Wendy Zellner, of the University of Toledo, and Fabrício Rodrigues, of Universidade Federal de Viçosa.

Datnoff, a professor and head of the AgCenter Department of Plant Pathology and Crop Physiology, said he wanted to ensure the paper would be comprehensive about the importance of silicon in agriculture and provide the reader with a detailed overview on why silicon is not used. ■ **ANTHONY BAILEY**



Graduate students Alisson Camargo and Eve Radam conduct disease rating on wheat applied with biostimulants; some of these biostimulant products contain silicon. Photo by Marlon Vieira

AGCENTER AGENT NAMED STATE WILDLIFE SPECIALIST

Caldwell Parish native Lucas “Luke” Stamper was recently named the new wildlife specialist for the state after serving as the LSU AgCenter regional wildlife and forestry contact for northeast Louisiana.

Stamper, who said he knew he wanted to be a wildlife biologist in high school, received his Bachelor of Science in wildlife ecology from LSU before getting his master’s degree at the University of Louisiana Monroe. He then returned to LSU for his doctorate from the School of Plant, Environmental and Soil Sciences with a focus on weed science.

“I’ve always been an outdoorsman and was raised outside hunting and fishing,” he said. “I’ve always had a love for wildlife

and the various management practices revolving around each species.”

Tara Smith, AgCenter executive associate vice president and director of the Louisiana Cooperative Extension Service, said Stamper is the right person for the job, which helps protect billions in revenue for the state.

“Forestry is over a \$3.4 billion industry in Louisiana, and the value of wildlife and fisheries enterprises across the state exceeds \$800 million annually,” Smith said. “We are beyond excited to capitalize on Dr. Stamper’s expertise in this arena and work toward implementing a dynamic statewide wildlife extension program.”

The wildlife specialist position is a 100% extension appointment that will

have Stamper traveling throughout the state educating stakeholders on how to deal with bothersome native and invasive species, from weeds to feral hogs.

■ **V. TODD MILLER**



SUBSCRIBE TO THE GET IT GROWING NEWSLETTER

The Get It Growing educational program features how-to articles, a weekly email newsletter and videos from LSU AgCenter horticulture experts. Its annual calendar curates beautiful photos of Louisiana flora and helpful advice on gardening, fruit and nut production, and landscaping.



**SUBSCRIBE TO THE WEEKLY
Get It Growing newsletter**

<https://tinyurl.com/GIGNewsletter>

From Our SOCIAL MEDIA

Join the LSU AgCenter on social media. AgCenter researchers and extension agents reach out via the web with videos, articles and helpful hints on Facebook, YouTube, Instagram, LinkedIn and X.

Join the conversation by following the LSU AgCenter.

FACEBOOK | FOLLOW THE AGCENTER AT [FACEBOOK.COM/LSUAGCENTER](https://www.facebook.com/LSUAGCENTER)

APRIL 14 | Now is the time in Louisiana when you may be bothered by the stinging buck moth caterpillar. The caterpillars become a problem when they fall from trees and drop to the ground to pupate in the soil.



X | FOLLOW THE AGCENTER AT [TWITTER.COM/LSUAGCENTER](https://twitter.com/LSUAGCENTER)



APRIL 17 | It's National Crawfish Day! Farm-raised crawfish continue to be Louisiana's most valuable aquaculture sector. Louisiana's producers are among the leaders in the nation in crawfish, oyster and alligator sales.

LINKEDIN | FOLLOW THE AGCENTER AT [LINKEDIN.COM/COMPANY/LSU-AGCENTER](https://www.linkedin.com/company/LSU-AGCENTER)

APRIL 2 | Because of her knowledge and interest in citrus, Anna Timmerman, the LSU AgCenter horticulture agent in the Greater New Orleans area, has been named the new citrus point of contact for the AgCenter.
#RESEARCH #CITRUS #LSUAGCENTER #EXTENSION

INSTAGRAM | FOLLOW THE AGCENTER AT [INSTAGRAM.COM/LSUAGCENTER](https://www.instagram.com/LSUAGCENTER)

FEB. 13 | The LSU women's basketball team enjoyed some delicious ice cream at the LSU AgCenter Dairy Store! Thanks for stopping by, ladies. Geaux Tigers!



YOUTUBE | FOLLOW THE AGCENTER AT [YOUTUBE.COM/LSUAGCENTER](https://www.youtube.com/LSUAGCENTER)

APRIL 16 | On this edition of Get It Growing, LSU AgCenter horticulturist Jason Stagg and AgCenter turf specialist Eric DeBoer discuss how to control existing cool-season weeds and emerging warm-season ones.



MICHAEL POLOZOLA:

NURTURING FRUITS, PECANS FOR LOUISIANA HOMEOWNERS AND INDUSTRY

■ OLIVIA MCCLURE

ON A GRAY FEBRUARY DAY as he drove through a nursery in Forest Hill, Michael Polozola stopped his truck to pick up a special passenger: a dog named Oliver.

Polozola, the LSU AgCenter's fruit and nut specialist, spends a lot of time at the nurseries of central Louisiana. He has befriended the nursery dogs — including Oliver, a lab mix who eagerly awaits his rides in the truck.

Although Polozola is always happy to spend time with his canine pals, it's the connections he's made with the people working in the local nursery industry that have proven crucial to his work, which aims to help homeowners and commercial growers alike successfully grow fruit and nut crops.

February was peak grafting season in Forest Hill, which is known as Louisiana's Nursery Capital. Workers got busy with their grafting knives and other tools before sunrise, making the precise cuts needed to splice cuttings from various kinds of trees onto hardy rootstock to create new trees that will be strong and productive. Polozola made a point of being there for many of those long days, practicing the craft of grafting and gathering data he hopes to use to identify the best grafting methods for different species.

Since he joined the AgCenter in 2019 as a horticulture agent based in Rapides Parish, Polozola has worked hard to foster relationships with area nurseries, an endeavor he has continued since being promoted to the fruit and nut specialist position a couple of years ago.

"One thing that I find is mission critical is having the collaborative relationship with Forest Hill so that those varieties that do well in the backyard are in the propagation pipeline and people can actually buy them," he said. "That was the No. 1 thing I discovered with pecans. I was recommending varieties for a home orchard or a low-input orchard, and people couldn't buy them. A few years later, now people can buy those. It's been one of my proudest accomplishments — ensuring that people can get the varieties that I recommend."

Polozola's job entails answering questions and developing resources to guide people statewide in growing fruits and nuts.

"That can encompass a whole bunch because we have such a wide variety of climates," he said.

Louisiana has pecan, strawberry and citrus industries. Historically, peaches were an economic force, and mayhaws are emerging as a potential new industry. In backyards, Louisianans can grow everything from apples and peaches to persimmons and berries.

"One day I might get a call from someone wanting to grow strawberries, and the next it might be Chinese dates, or jujubes," Polozola said.

He enjoys the variety of questions he gets from home gardeners. On the industry front, he likes being there to provide support when problems arise. He tries to identify new and unfamiliar cultivars that do well and encourages nurseries to grow them.

Polozola's passion for plants dates back to his childhood.



Provided photo.



Michael Polozola, AgCenter state fruit and nut specialist, works closely with the nursery industry to ensure Louisianans have access to the best fruit and pecan trees for the state's growing conditions.

Photo by Olivia McClure

"I started with my grandfather. He did camellias, but he also had a big fig orchard, so fruit trees were something important with him," he said. "Growing up, that was how we spent time together as a family. It's lovely to have been able to take that and transition it into a career."

But he wasn't always certain of his career path.

"I had shared passions for horticulture and history. I had to think about it, and I felt like with history, you're always looking back, even though you can use it to make a better tomorrow," Polozola said. "But with horticulture, it really is about, 'How can I improve the world today?' That's how I viewed it."

He received bachelor's and master's degrees from LSU's School of Plant, Environmental and Soil Sciences. He considers former AgCenter horticulturist

Charlie Johnson a mentor and credits him with sparking his interest in fruit and nut trees. Polozola went on to earn a doctorate from Auburn University, where his dissertation research focused on pecans, in 2018.

Polozola still uses some of the skills he learned from his grandfather and his mentors at LSU. For example, they taught him how to graft, which has come in handy as he works to help nurseries improve their tree production.

While he likes working with all sorts of plants, there's something special about fruits and nuts, he said.

"I like the balance of it's edible and it feels like you're being a good steward," he said. "There's something about growing something and being able to eat from it that I enjoy."

He also is proud of the bonds he has forged with the industry. After a chilly February morning spent recording some videos about grafting while employees worked nearby, Polozola set his tools aside and headed into the nursery office for lunch. Polozola chatted with employees and customers as Oliver and two of his dog friends lingered, hoping for a few scraps of a chicken pot pie Polozola had baked.

Soon, Oliver was ready for his afternoon ride around the nursery. Polozola opened the truck door for him, and they headed into the field. It was time to get back to work.

Olivia McClure is a writer, editor, photographer and videographer for AgCenter Communications.

A woman with blonde hair, wearing a sleeveless patterned shirt, stands in a greenhouse filled with lush green citrus plants. She is smiling and has her hand on her hip. The background shows the structure of the greenhouse and more foliage.

**ANNA TIMMERMAN EVALUATES CITRUS
GROWN IN A SCREENED ENVIRONMENT
AT THE DOCVILLE FARM IN VIOLET.**

Photo by Kyle Peveto

MEET ANNA TIMMERMAN, *THE AGCENTER LOUISIANA CITRUS EXPERT*

■ KYLE PEVETO

AS THE LSU AGCENTER EXTENSION AGENT FOR ST. BERNARD AND PLAQUEMINES PARISHES, Anna Timmerman has become a trusted source of information for the citrus industry, home fruit and vegetable growers and small producers who sell at the more than 30 farmers markets in the Greater New Orleans area. Timmerman's expertise was so well respected that she was named the state point of contact for citrus earlier this year.

Timmerman arrived in Louisiana 15 years ago after earning an associate degree in crop and soil science from Michigan State University and a Bachelor of Fine Arts in painting from the Art Institute of Chicago. Timmerman moved to New Orleans after Hurricane Katrina and worked in landscaping. She joined the AgCenter in 2016 and earned a master's degree from Louisiana State University in the School of Plant, Environmental and Soil Sciences. Timmerman manages to combine her passion for agriculture and horticulture with painting. She keeps chickens and combines their eggs with pigment to create egg tempera paintings of landscapes and flowers.

In an interview earlier this year, Timmerman discussed her love for growing plants and educating others.

WHAT DOES THE HORTICULTURAL WORLD LOOK LIKE IN GREATER NEW ORLEANS?

Gardening is a huge pastime here in New Orleans, as is market farming. There are over 30 farmers markets in the metro area. You pick the day of the week; there's at least one farmers market. I'm working with about 200 urban and suburban specialty crop producers, ranging in size from many acres to a single backyard. There's also a growing market for local cut flower producers, locally grown herbs and specialty nurseries. These are usually new growers in our industry who start with the backyard nursery certificate but who are scaling up, building a couple of greenhouses and starting to get into more of the retail nursery space.

HOW DID YOU BECOME INTERESTED IN HORTICULTURE?

I am from west Michigan, which is a huge specialty crop area that produces greenhouse crops, blueberries, asparagus and apples. I grew up on the family farm and began to work at a fairly young age alongside other members of the extended family. My grandparents did the local farmers markets, had a roadside stand and had a cut flower operation, so I learned a lot from them. By the time I graduated high school, I was doing two farmers markets myself and had about an acre in production that I was solely responsible for. I was kind of born into it, and I still do a lot of growing and experimenting at my house in the Ninth Ward where I raise vegetables, cut flowers, chickens, rabbits, ducks and goats.

WHAT ARE THE TOP CHALLENGES THAT YOU SEE FOR CITRUS?

The biggest one is that we desperately need a cure or proven disease-resistant cultivars when it comes to citrus greening disease. That's No. 1. Once the trees get it, there's no cure, and they decline pretty rapidly and die within a few

years. I know that the citrus crop was about 80% down this year in Florida, and I suspect we're kind of in that ballpark here in Louisiana, too. The second one is land access and bringing in some of these new and beginning farmers that I'm working with. It's really hard for them to get loans or the capital they need to get the ground to grow on. A lot of them start out on empty lots here in the city with 60 by 120 feet. Land costs, student loan debt and insurance prices have locked a lot of my younger growers out, and I don't know how to fix that yet. Maybe partnering some of them with the older, retiring growers, doing like some kind of mentorship initiative.

WHAT DO YOU THINK IS THE FUTURE OF CITRUS IN LOUISIANA?

I don't see demand going away from the consumer side. We need to start adapting some of the newer technologies I've been researching — growing citrus in containers or even in-ground under an insect exclusion screen. It keeps the pests out, including the Asian citrus psyllid, and I end up using fewer pesticide products, which is great when it comes to consumer preferences. I'm growing trees that were grafted to a dwarf rootstock, allowing for a high density of trees in a small space. In year four of production, it averaged close to 8,000 pounds to the acre. Florida is doing the same thing with grapefruit and juice oranges. I'm doing it with satsumas since that's our largest citrus market, and I've got four growers adopting the screens as a growing practice at this point. I'm trying to push some of my urban growers into growing citrus and other fruits in containers using precision agriculture techniques. The orchards are compact, relatively easy to care for, and can be adapted for organic markets. Container orchards like mine always bring a lot of comments from traditional orchard growers, since it looks more like you're growing tomatoes than oranges, but it works.

Kyle Peveto is the editor of Louisiana Agriculture.

AGCENTER EXTENSION AGENTS HELP FRUIT AND NUT GROWERS EVOLVE

■ KYLE PEVETO

ACROSS LOUISIANA, abundant sunshine, plentiful rain and fertile soils allow many fruits and pecans to thrive.

Without help from human hands, mayhaws grow in swamps, native pecan trees flourish and dewberries thread through thickets and fencerows.

For hundreds of years, Louisianans have cultivated orchards, growing citrus, pecans and other assorted fruits, and today the LSU AgCenter helps these growers produce traditional crops and develop new possibilities.

“It’s a hodgepodge. In my mind, it’s almost like a pot of gumbo,” Michael Polozola, the LSU AgCenter state fruit and nut specialist, said of the Louisiana fruit and nut crop landscape. “There’s a whole lot of stuff mixed together.”

Fruit crops contributed \$32.9 million to the state’s \$7.3 billion agricultural economy in 2023, according to the Louisiana Ag Summary from the LSU AgCenter, with strawberries, citrus and blueberries accounting for the majority of the value. Pecans contributed an additional \$7.6 million.

Larger commercial growers account for much of the economic impact associated with fruits and nuts. However, many fruit and nut producers are part-time growers selling smaller amounts at farm stands and farmers markets, or they are home growers providing fresh fruits and pecans for friends and family.

AgCenter Extension professionals assist Louisiana producers of all sizes by providing advice and information about available varieties and production techniques. AgCenter fruit and nut specialists run trials to give knowledgeable advice to growers on which varieties grow best in each region.

“I think that’s how I view our role as extension,” Polozola said. “It is to try and help those producers turn that into a viable enterprise.”

Polozola has scoured the countryside searching for almost forgotten pecan trees that will produce the best crop for smaller-scale farmers while also evaluating dozens of strawberry plants to decide which are best for the home grower. In southeastern Louisiana, agent Mary Helen Ferguson has helped strawberry growers find solutions for diseases and pests that threaten their crops. In north Louisiana, AgCenter horticulture agent Kerry Heafner has worked to rescue fruit and vegetable varieties from near extinction.

2023 GROSS FARM VALUE OF TOP ORCHARD CROPS

Strawberries — \$11.6 million

Pecans — \$7.6 million

Blueberries — \$7.3 million

Citrus — \$4.9 million

Source: 2023 Louisiana Ag Summary

Instructing growers on which fruit or pecan cultivars to plant becomes tricky. Often, the optimal tree or bush for a Louisiana grower cannot be found in garden centers, Polozola said.

“One of the biggest limitations to the fruit industry in our state is people being able to purchase the varieties that do well,” he said. “They are not very common. They’re very niche. A lot of times people have to special order them.”

To help increase the number of fruit and pecan varieties available to Louisiana growers, Polozola has worked with

plant nurseries to graft top-performing but hard-to-find varieties of pecans, mayhaws and other fruits.

For example, pawpaws, a native citrus fruit with a custardlike texture, have grown in popularity in recent years, but these trees are difficult to find. This spring, Polozola is working to graft 500 pawpaw trees to increase their availability.

In the New Orleans area, Anna Timmerman, a horticulture agent for St. Bernard and Plaquemines parishes and the new AgCenter point of contact for citrus, investigates new growing methods and varieties for all of the state — not just the traditional commercial citrus farming region of southeastern Louisiana.

Commercial citrus production focusing primarily on satsuma and navel oranges is declining in that traditional area. One reason is quarantinable diseases, which include citrus canker and citrus greening, that restrict the movement of plants and materials.

“We have an aging farmer population, too, so a lot of them are retiring and selling property or pulling out trees to make it more manageable,” Timmerman said.

Today, Timmerman sees more people planting two or three trees in their backyards. These small-scale growers share their bounty with friends or sell bundles of fruit at farmers markets or from their homes.

“Citrus is such a rewarding crop,” Timmerman said. “You can get a lot of fruit in a very small amount of space once they get going.”

While many growers want the small, easy-to-peel satsumas, less common



citrus fruits, such as pomelos, blood oranges and finger limes, which resemble tiny caviar-like pearls inside, are drawing interest from homeowners and New Orleans chefs who love local foods. Timmerman also works with tropical nurseries to give residents advice on more exotic fruits, including cold-hardy guavas and avocados and tropical fruits from southeastern Asia, such as dragon fruit.

“Some of the unusual cultivars, people are getting into collecting them,” she said.

In a facility at the Docville Farm owned by the Meraux Foundation in Violet in St. Bernard Parish, Timmerman researches container-grown citrus varieties, with dozens of plants growing in a greenhouse facility. She is searching for insights into new methods that can protect these fruits from freezes and disease.

Along with an array of citrus varieties, Louisiana growers have shown interest in several emerging crops, Polozola said. Blackberry and blueberry production has become more popular, and these berries

can easily be grown on small plots or for commercial purposes.

Mayhaws, a tart berry native to swamps and sloughs, grow well when cultivated and managed like other fruit-producing trees. It has become popular for growers in northern Louisiana, where peach root rot has devastated the peach industry. Polozola thinks mayhaws could become a viable replacement for some peach growers.

“It would be neat to see if that might be able to fill that kind of niche,” he said.

Across the state, AgCenter Extension agents work to find new growing

opportunities — and sometimes resurrect old ones — while advising growers of all sizes.

“That’s what I love about our extension model,” Polozola said. “By collaborating closely with growers and working directly in the fields, we not only address current challenges but also pave the way for new, emerging opportunities that could be profitable for their operations. Together, we are ensuring a bright and promising future for Louisiana’s fruit and nut industry.”

Kyle Peveto is the editor of Louisiana Agriculture.

[Above] Michael Polozola answers questions about blackberry production at an AgCenter Extension workshop on fruit production. Photo by Kyle Peveto

[Right] Anna Timmerman holds a satsuma grown at the Docville Farm screenhouse. Photo by Anthony Bailey





UNCOVERING LOUISIANA'S HIDDEN PECAN GEMS

■ MICHAEL POLOZOLA

***WOODMAN PECANS GROW IN A POINTE COUPEE
PARISH ORCHARD IN NOVEMBER 2024.***

Photo by Kyle Peveto

IN THE HEART OF LOUISIANA, the quest to discover superior low-input cultivars of pecan from native pecan trees is underway. This endeavor, driven by dedicated research and trials conducted by the LSU AgCenter, is crucial for the survival and prosperity of the pecan industry in the state. By exploring the rich history and current state of the industry, the importance of finding new low-input cultivars will become evident.

CHALLENGES IN THE PECAN INDUSTRY

The Louisiana pecan industry has long been a cornerstone of the state's agricultural landscape. However, disease, pests and economic pressures have made it increasingly difficult for traditional cultivars to thrive. One of the most destructive threats is pecan scab, a fungal disease caused by *Fusicladium effusum*. It primarily affects leaves, nuts and young shoots, leading to black lesions that can merge and cause significant damage. Pecan scab thrives in warm, humid conditions and can severely reduce both the yield and quality of pecans, making it the primary limitation to pecan production.

Managing pecan scab in cultivars with no-to-low resistance requires regular fungicide applications, which can be costly. In response, the industry has shifted toward low-input production practices that rely upon scab-resistant cultivars, which are more sustainable and economically viable.

Under this strategy, the variety Elliot has reigned supreme. Although it is an older pecan variety, Elliot has maintained its scab resistance for more than a century. It produces smaller, oil-rich kernels known for their great taste and good kernel fill, allowing it to command a premium in the Louisiana market.

Unfortunately, Elliot has developed one significant weakness. When not treated with fungicides, it is not scab but Gnomonia leaf spot that poses the greatest threat. This disease takes hold late in the season and causes early defoliation. While occasional early leaf drop is not a major issue, repeated yearly defoliation causes a problem known as alternate bearing — producing fruit every other year — to occur more than usual and produces lower quality pecans. While it is not unusual for Elliot to alternate bear on a two-year cycle, this emerging issue is causing some trees to enter a three- or even four-year yield cycle.

THE SEARCH FOR NEW CULTIVARS

To ensure the industry's future, it is essential to identify and cultivate new pecan varieties that combine high yield, quality and disease resistance with minimal input requirements. Auburn University has made significant efforts in this area, introducing low-input selections such as Amling, Gafford, McMillian and Syrup Mill. Additionally, Kanza and Lakota from the U.S. Department of Agriculture pecan breeding program have shown potential.

While these varieties can perform well across the state, south Louisiana presents a unique microclimate with high disease pressure. Very little work has been done to search this germplasm — the living genetic resources, such as seeds or tissue — for new selections. Fortunately, a few passionate individuals in the Louisiana Pecan Growers Association have taken on the task.

This work also holds great potential for homeowners. With the development of pecan trees that are resilient and



Pecans that are not quite ready for picking grow from a tree in a Pointe Coupee Parish orchard in November 2024.
Photo by Kyle Peveto



productive with minimal maintenance, homeowners can enjoy the benefits of growing pecans without the need for intensive management. These low-input varieties are ideal for backyard orchards, providing a sustainable and rewarding option for those interested in cultivating pecans at home.

As part of the LSU AgCenter Extension efforts, collaboration with passionate growers has yielded great results. Some USDA and Auburn selections have shown both scab resistance and productivity. In an exciting development, Louisiana native selections with potential have been identified though caution is necessary. These selections can often fall victim to the “yard tree effect,” where a tree performs well in isolation within its unique microclimate but underperforms when replicated in orchard conditions.

Various individuals have trialed their unique native finds, but most have fallen victim to the yard tree effect. Two promising selections have emerged from this quest: Manda and Woodman. Both are native selections from Pointe Coupee Parish, identified through collaborative efforts involving the LSU AgCenter and local growers.

MANDA: THE PRECOCIOUS CULTIVAR

Manda has proven to be very precocious, meaning it enters production early in its life cycle. These can be thought of as “lifetime trees” because an older person can plant one and

live to see it produce a crop. Remarkably, Manda has yielded up to 5 pounds of pecans within just four years of planting.

Manda has shown tolerance to pecan scab. Though it may have a light infection in years of high disease pressure, this does not significantly reduce its yield. The only issue observed is that Manda can be too enthusiastic in its yielding potential, setting a large crop that can cause limb breakage in some years. Nevertheless, it produces nice, average-sized pecans with moderate oil content, making them a good choice for various uses.

WOODMAN: THE RESILIENT CULTIVAR

Woodman has shown great potential for low-input settings. One of its many strengths is that it holds its leaves late in the season, avoiding the early defoliation that Elliot is prone to. This difference is dramatically evident when the two cultivars are grown side by side, with Elliot often looking quite bare next to a Woodman still full of foliage.

There are multiple implications of this trait. By holding its leaves longer, Woodman does not exhibit significant alternate bearing. While it may still have slightly off years after a heavy one, these are much less likely to occur, resulting in consistent yields year to year. The extra carbohydrate reserves it accumulates from holding its leaves later in the season also contribute to faster growth compared to Elliot. Woodman trees

Woodman pecans grow in a Pointe Coupee Parish orchard in November 2024. Photo by Kyle Peveto

In the foreground stands an Elliot pecan tree, which loses its leaves earlier than Woodman pecan trees standing in the background. Photo by Kyle Peveto



will grow larger more quickly with fewer inputs than Elliot trees in the same environment. Additionally, Woodman naturally grows with excellent branch angles, contributing to its status as a healthy, long-lived tree resistant to limb breakage and weather injury.

Woodman also demonstrates great scab resistance, further enhancing its suitability for low-input settings. It produces nice, average-sized pecans with moderate oil content, making them a reliable choice for growers.

SECURING THE FUTURE OF LOUISIANA'S PECAN INDUSTRY

The quest to uncover Louisiana's hidden pecan gems is not just about preserving the past but also about securing the future of the state's pecan industry. By identifying and cultivating low-input cultivars like Manda and Woodman, growers can ensure sustainable and economically viable production. While Manda's precocity allows for early production, Woodman's consistent yields and robust growth make it a reliable choice for long-term cultivation. These cultivars show potential for resilience and productivity, making them valuable additions to Louisiana's pecan repertoire.

To ensure these new selections can be made available for purchase, collaboration with the nursery industry in

Forest Hill has been crucial. Forest Hill, located in Rapides Parish, is a key hub for Louisiana's nursery industry. The area is renowned for its excellent water quality, favorable climate and long growing season, all of which are ideal for long-term plant growth. This makes Forest Hill an important center for nurseries that supply a wide variety of plants, including pecan trees. By working closely with nurseries, efforts are being made by AgCenter agents to propagate and distribute these promising cultivars, making them accessible to both commercial growers and homeowners. This partnership is vital for the widespread adoption of these new varieties and the overall success of the pecan industry in Louisiana.

These efforts not only benefit commercial growers but also offer exciting opportunities for homeowners to enjoy the rewards of pecan cultivation. As research and collaboration continue, the future looks promising for Louisiana's pecan industry, with resilient and productive cultivars leading the way.

Michael Polozola, the LSU AgCenter Extension state fruit and nut specialist, is stationed at the AgCenter Dean Lee Research and Extension Center in Alexandria.



**RED CHAMP MAYHAWs WERE DEVELOPED
AFTER 20 YEARS OF HYBRIDIZING.**

Photo by Michael Brook

MAYHAWs: A TASTE OF LOUISIANA'S HERITAGE

■ MICHAEL POLOZOLA

MAYHAWs, small, tart berries from a native hawthorn tree (*Crataegus opaca*), have long been a cherished part of Louisiana's natural landscape. These berries hold a special place in the hearts of many Louisianans because of their unique flavor and versatility in culinary applications. The LSU AgCenter continues to play a crucial role in supporting research initiatives and promoting the unique qualities of mayhaw products, ensuring the industry's growth and sustainability. Whether enjoyed as a sweet spread on biscuits, as a tangy syrup drizzled

over pancakes or as a delightful wine, mayhaws offer a taste that captures the essence of Louisiana's rich cultural heritage.

THE MAYHAW INDUSTRY IN LOUISIANA

The mayhaw industry in Louisiana has deep roots, with a history that dates back to the early settlers who first discovered the berries in the wild. Traditionally, mayhaws grew in the swamps, and locals would harvest them from native groves. This often involved using boats and nets

to navigate and collect the berries from the bogs. Over the years, the industry has grown — albeit on a small scale — thanks to dedicated growers and enthusiasts working tirelessly to promote and preserve this unique fruit. Established in 1995, the Louisiana Mayhaw Association has been instrumental in supporting growers and promoting mayhaw products. Despite its modest size, the industry contributes to the local economy by providing income for small-scale farmers and creating opportunities for agritourism.

CULTIVARS OF MAYHAW

The development of mayhaw cultivars has largely been driven by the efforts of passionate hobbyists and dedicated growers. These individuals have played a crucial role in creating and promoting better cultivars to support the industry. Mayhaw breeder Billy Craft has been a significant figure in the industry, dedicating many years to growing and hybridizing mayhaws. His work has resulted in the development of several superior cultivars that have greatly benefited the industry.

Here are some notable contributions:

- **SURPRISE:** Developed by Craft, this cultivar is known for its large fruit and high productivity. It blooms later than other varieties and is highly resistant to fire blight. The fruit has a sweet-tart flavor, making it ideal for jellies and syrups.
- **DOUBLE G:** A cross between Texas Star and Royal Star, this Craft selection produces dark red fruit with strawberry-colored pulp and is known for its early production and excellent tree form. The fruit's unique color and flavor make it a favorite for fresh consumption and culinary uses.
- **RED CHAMP:** Resulting from 20 years of hybridizing by Craft, Red Champ is a large-fruited, dark red mayhaw. It is highly productive and resistant to fire blight, making it a favorite among growers. The fruit's robust flavor and high yield make it popular for commercial production.
- **MAXINE:** Found near DeRidder, Louisiana, by James Eaves and named for his wife, Maxine is a large-fruited, late-blooming mayhaw with excellent tree shape and high resistance to fire blight. It is considered one of the best trees ever taken from the wild. The fruit's exceptional quality and the tree's resilience make it highly valued by growers.



Mayhaws grew in the wild and were harvested by early settlers in Louisiana. Photo by Michael Brook



Growers have worked to promote the mayhaw industry over the years. Photo by Skip Lavespere

UNTAPPED GENETIC DIVERSITY

The story of Maxine not only adds a personal and heartfelt touch to the narrative of mayhaw cultivation but also underscores the untapped genetic diversity of mayhaws in the wild. Louisiana lies within the native range of wild mayhaws and is home to a wealth of genetic diversity that remains largely unexplored. This genetic richness presents an exciting opportunity for future discoveries and the development of new cultivars. As growers and researchers continue to explore and study wild populations, they may uncover additional traits that can further enhance the industry.

EXPANDING THE MARKET

One of the biggest contributions to the mayhaw industry has been the effort to connect growers with the nursery industry in Forest Hill. Historically, mayhaws were so niche that many growers had to graft their own trees to expand or start their orchards. This presented a barrier for those unfamiliar with grafting techniques and the nuances of container production. With guidance and support from the LSU AgCenter, local nurseries have been able to increase the number of mayhaw trees on the market, making it easier for new operations to get started and for existing ones to expand. This initiative has significantly benefited growers, allowing them to expand their orchards without the steep learning curve of grafting, leading to increased production and growth within the industry.

PARTNERSHIP AND SUPPORT

The LSU AgCenter regularly partners with the Louisiana Mayhaw Association to provide educational programs and assist with production issues. One of the key accomplishments of this collaboration has been the successful effort to increase the number of mayhaw trees on the market. This partnership ensures that growers receive the latest information and support needed to overcome challenges and improve their operations and promotes the growth and sustainability of the mayhaw industry in Louisiana.

CHALLENGES AND OPPORTUNITIES

Mayhaw growers face several challenges, including susceptibility to diseases like fire blight, cedar apple rust and quince rust. Fire blight, caused by the bacterium *Erwinia amylovora*, can cause significant damage to blossoms and shoots. Cedar apple rust, caused by the fungus *Gymnosporangium juniper-*

peri-virginianae, leads to deformed fruit and swollen twigs. Quince rust, caused by the fungus *Gymnosporangium clavipes*, is particularly destructive, affecting fruits, stems and leaves and leading to spiny, orange-coated fruit. Managing these diseases is difficult due to the limited availability of labeled products for mayhaws.

Still, the industry presents numerous opportunities for growth, particularly through the development of new cultivars and increased marketing efforts. There are long-term goals to establish a mayhaw research and demonstration orchard at the LSU AgCenter Dean Lee Research and Extension Center. This initiative aims to partner with the industry and the Louisiana Mayhaw Association to better evaluate new selections and find solutions to existing barriers to production, such as fire blight, cedar apple rust and quince rust. Additionally, the orchard would provide a valuable avenue for applied research on fertilizer rates and applications, areas where there is currently limited data.

CONCLUSION

Though small, the mayhaw industry in Louisiana is a testament to the dedication and passion of its growers. With continued support and innovation, the future of mayhaws looks promising. As more people discover the delightful taste and cultural significance of mayhaws, this industry is poised for growth and success. By embracing both tradition and innovation, the mayhaw industry will continue to thrive, ensuring that these cherished berries remain a beloved part of Louisiana's heritage for generations to come.

Michael Polozola, the LSU AgCenter Extension state fruit and nut specialist, is stationed at the AgCenter Dean Lee Research and Extension Center in Alexandria.

Tart mayhaw berries can be used to make jellies, syrups and wine. Photo by Skip Lavespere



Red Champ mayhaws are highly productive and resistant to fire blight. Photo by Michael Brook

HOME CITRUS: A LOUISIANA TRADITION

■ ANNA E. TIMMERMAN

PICKING HOMEGROWN, TREE-RIPENED CITRUS in your own backyard is incredibly rewarding. Citrus has been grown in Louisiana for over 300 years. Citrus fruits were brought to Plaquemines Parish by Father La Rue, a Jesuit missionary, who planted trees grown from seed 35 miles south of New Orleans. In the early 1800s, commercial groves were established along both sides of the lower Mississippi River in southeast Louisiana, all grown from seed as well. Today, citrus remains an important part of the state's horticultural landscape, supported by research and outreach from the LSU AgCenter.

Over the years, grafted and budded trees allowed for tasty cultivars of oranges, satsuma mandarins and lemons on hardy rootstock. A “satsuma boom” in the 1920s saw many groves planted along what is now the Interstate 12 corridor on the north shore of Lake Pontchartrain; however, severe frosts killed many trees, and most were not replanted.

Today, the majority of commercial citrus groves are in Plaquemines and St. Bernard parishes, with additional growers in coastal parishes further west. Frost and winter cold continue to be the primary limiting factor in home

citrus production, limiting gardeners to hardy cultivars or container production in northern areas of Louisiana. Luckily, there are some great strategies that can be used, meaning that citrus can be successfully grown statewide. Through ongoing LSU AgCenter trials, new growing methods, such as container-grown trees, and management strategies that work on large- and small-scale groves are being developed.

Along the coastal areas and south of Lake Pontchartrain in Louisiana, all types of citrus can be grown, including the most cold-sensitive cultivars such as tangerines, limes and lemons. This is known as Zone I in the LSU AgCenter's Louisiana Home Citrus Production guide, available as a free download on the website. In Zone II, which includes areas north of Zone I and Lake Pontchartrain up to around the Baton Rouge area, only hardy citrus can be grown in the ground, which includes calamondins, kumquats and satsumas. In-ground plantings of oranges, lemons, limes, grapefruit and other citrus may need to be covered or protected during freezes in this marginal zone. North of Baton Rouge to the state line is Zone III, which has regular hard freezes. In this zone, in-ground trees need to be covered for winter, and growers are limited to the most cold-hardy types of kumquats, calamondins and newly developed cold-hardy cultivars of satsumas, which can survive temperatures as low as 20 F once established.

Luckily, all varieties of citrus can be successfully grown in containers. This allows home gardeners to grow lots of tasty fruit by moving the trees indoors



GRAFTING ALLOWS FOR AN ASSORTMENT OF TASTY CULTIVARS.

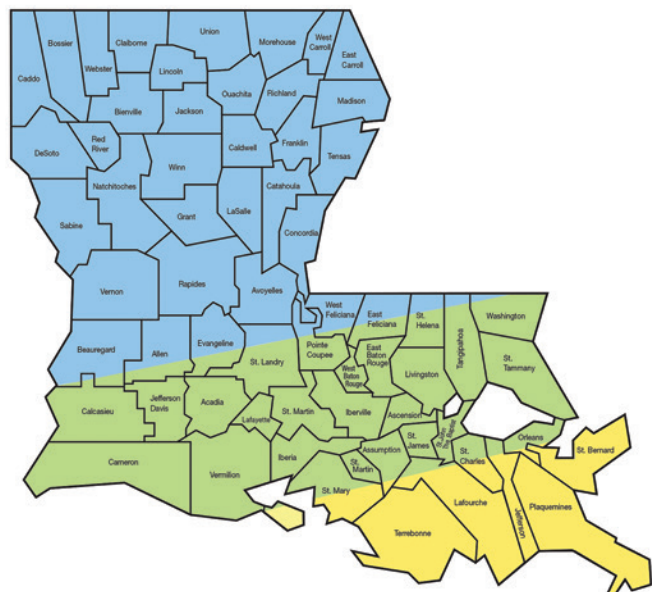
Photo by Anna Timmerman

SCAN FOR THE
Louisiana Home Citrus
Production guide





A handheld refractometer can be used to test the brix level or amount of sugar in the fruit. Photo by Anna Timmerman.



Citrus in Zone III (blue) would freeze regularly. Zone II (green) is a marginal area where only the cold-hardy satsuma and kumquats should be grown. Zone I (yellow), the coastal area, is the primary area of commercial citrus production. Generally, all citrus types can be grown in this zone. LSU AgCenter file photo

during cold weather. Citrus trees have been grown in containers for hundreds of years, most famously at Versailles in France since the 1400s. Potted citrus trees are stored in a glasshouse for the winter and wheeled back out to the garden for the warm seasons. Periodic root pruning helps maintain tree size and prevents circling roots.

The most cold-hardy citrus is the trifoliate orange, which can handle temperatures as low as -20 F. This tree produces seedy, inedible fruits, but is extremely tough against root rot pathogens and frost damage. This quality makes it a good rootstock for grafting and budding other types of citrus, imparting a few more degrees of cold tolerance to more sensitive fruits. A dwarf version of trifoliate orange, Flying Dragon, works in the same way but also imparts a smaller size at maturity for the cultivars grafted to it, creating dwarf trees that work well in containers and small yards. All citrus trees sold at garden centers are grafted

or budded onto rootstocks, resulting in a tree that has a better chance of surviving and producing a crop.

Home gardeners can grow citrus in containers by planting them into 15-20-gallon pots. Use good quality commercially available potting soil or make a custom mix. Many container citrus growers recommend a 5-1-1 mix: five parts pine bark fines, one part potting soil or sifted compost and one part perlite. Choose pots that have adequate drainage holes in the bottom and no lip or indents that would make repotting difficult. Ceramic, plastic, terra cotta, whiskey barrels or concrete planters all work well.

Citrus trees grown in containers are fertilized year-round, which contrasts with the schedule recommended for in-ground trees. Because nutrients leach out each time a container-grown tree is watered, all nutrients needed by the tree should be provided in the pot. There are excellent fertilizers specifically formu-

lated for citrus trees available at garden centers. Follow the label directions for the size tree you have.

Container citrus trees should be moved indoors when there is a threat of frost. The roots are more exposed in a pot than they would be in the more insulated ground. Use a dolly to move trees indoors or into an area that will be maintained above freezing. Trees can go back outdoors when the danger of frost passes. In the most northern parts of the state, this strategy ensures that the trees live and thrive, leading to good fruit settings and production.

Citrus trees have a home here in Louisiana and can be grown and enjoyed statewide. Check your local garden center this spring and consider adding some to your landscape. The sweet rewards will be worth the effort.

Anna Timmerman is an AgCenter Extension agent for St. Bernard and Plaquemines parishes and is the state point of contact for citrus fruits.

HISTORY OF THE LSU AGCENTER FIG BREEDING PROGRAM

■ MICHAEL POLOZOLA AND JASON STAGG

FIGS HAVE BEEN AN IMPORTANT FRUIT CROP in Louisiana for over 150 years. Currently, figs are grown as a dooryard fruit crop in every parish of the state, with small market orchards found in southernmost Louisiana for local markets. A "dooryard fruit crop" refers to fruit trees or plants that are grown in the yard or garden area immediately surrounding a home. These crops are typically cultivated for personal use rather than commercial production. They are planted close to the house, making them easily accessible for daily use and are grown on a smaller scale compared to commercial orchards. The primary purpose is for home consumption, including fresh eating, home canning and processing. With the rise of local farmers markets, there is increasing demand for fresh figs for local sales.

The LSU fig breeding program was initiated in the 1950s by horticulture professor Ed O'Rourke to develop fig cultivars suited for the Gulf South region. The initial breeding efforts focused on creating varieties with improved fruiting characteristics, disease resistance and cold tolerance. Although the program was discontinued in the 1960s, elite selections — individual trees showing the most promise — were maintained and evaluated over the years.

In 1997, the program was revived under the leadership of horticulturist Charlie Johnson. A project was initiated to reestablish an evaluation orchard containing these elite selections along with other recommended cultivars for comparison of fruiting characteristics, disease resistance, growth characteristics and cold tolerance for commercial potential. For trialing under different growing conditions, plantings were installed at various research stations across Louisiana. Six selections from this group were chosen for their superior fruiting characteristics to be released as cultivars.

NOTABLE LSU FIG RELEASES

1. **O'ROURKE:** Also known as improved Celeste, this variety produces tan-to-light-brown, moderate-sized fruit with a closed eye. The fruit sets upright on a long peduncle (the stalk that supports the fig) and hangs upside down when ripe.
2. **CHAMPAGNE:** Tested as Golden Celeste, this variety has good cold tolerance and produces medium-sized yellow fruit. The tree performs well in areas where Celeste thrives.
3. **TIGER:** Known for its good cold tolerance, this variety produces large fruit with a stripe on immature fruit. The trees are small to moderate in size and have a tendency to grow horizontally during the juvenile phase.
4. **LSU GOLD:** This variety produces large yellow-to-gold fruit on a vigorous and upright-growing tree. It has average resistance to cold and moderate resistance to fig leaf rust. It is recommended for growing in the Gulf Coast area.
5. **LSU PURPLE:** Known for its heavy crop of bright purple fruit, this variety can ripen fruit on very young plants. Most fig varieties require three to four years of juvenile growth before producing ripe fruit, but LSU Purple can produce small crops within one to two years. The fruit quality is reported as good to excellent on older trees. It is recommended for planting in the Gulf Coast area.
6. **SCOTT'S BLACK:** This selection produces large round and plump good-quality fruit with a dark skin and red pulp. It is known for its intensely delicious flavor and is a top choice for humid, mild winter areas. The variety is disease-resistant and productive, making it a great option for home gardeners in hot, humid Southern regions. It complements current recommended varieties by increasing the diversity of fruit types.

BENEFITS OF FIG CULTIVATION

Fig trees are relatively easy to cultivate, requiring minimal use of pesticides or synthetic fertilizers, which makes them ideal for organic production systems. Figs hold a special cultural significance in Louisiana, particularly among communities descended from Italian and Sicilian immigrants. These immigrants brought with them a rich tradition of fig cultivation, preservation and culinary use.

Figs have been an integral part of Louisiana's culinary heritage, often preserved and canned for use throughout the year. They are a key ingredient in traditional recipes such as fig preserves and Italian fig cookies, which are cherished in many households. The practice of preserving figs has been passed down through generations, reflecting the deep-rooted cultural connections to this fruit.

Although the LSU AgCenter fig breeding program was discontinued in the 1960s, the germplasm (living genetic resources, such as seeds or tissue) was maintained and released over the years. In recent years, there has been a renewed interest in figs, and people are now seeking out the LSU varieties. Some cultivars, such as LSU Purple and LSU Gold, are common in the nursery trade, while others can be harder to locate. With this renewed interest, there are also many fig varieties circulating as LSU releases that have no connection to the original breeding efforts.

Recently, the LSU AgCenter Dean Lee Research and Extension Center received a generous donation of most of the LSU fig cultivars, along with many other promising varieties. The primary goal of this initiative is to preserve these cultivars and make them more accessible to the public. Although the trees are currently small, the center aims to use them to share cuttings with those interested in growing LSU selections. This effort will help ensure that these unique and valuable fig varieties continue to thrive and be available to home gardeners and local growers, furthering the legacy of the LSU AgCenter's contributions to fig cultivation in the Gulf South region.

LSU's fig cultivars, especially some of the lesser-known and less common ones, still have great potential and unique characteristics that can be excellent for home gardeners. These varieties offer a diverse range of fruit types, colors and flavors, making them a valuable addition to any home garden.

Michael Polozola, the AgCenter Extension state fruit and nut specialist, is stationed at the AgCenter Dean Lee Research and Extension Center in Alexandria. Jason Stagg is an AgCenter horticulturist based at the LSU AgCenter Botanic Gardens at Burden.



1. *LSU Purple is probably the most recognizable of the LSU-bred varieties because of its dark purple, glossy hue and oblong shape. Photo by Jason Stagg*
2. *Tiger is a large-sized fig that develops a distinctive dark stripe before ripening. Photo by Jason Stagg*
3. *LSU Gold is the largest fruit of the LSU fig varieties. Photo by Jason Stagg*
4. *Champagne is a moderate-sized yellow fruit on robust, upright trees. Photo by Jason Stagg*





BERRY BLISS:

GROWING BLACKBERRIES USING THE TPUPS TRELLISING TECHNIQUE

■ MICHAEL POLOZOLA

ONE OF THE MOST COMMON pitfalls in blackberry cultivation is allowing the planting to become unmanageable. Many growers struggle with pruning, and before long, their blackberry patch turns into an overgrown, diseased mess. The Trellised Production Using Primocane Suppression (TPUPS) technique offers an innovative solution. This method simplifies the harvesting process, significantly reduces disease pressure and makes growing thorny selections less of a prickly affair. Inspired by the success of horticulturist Arlie Powell of Alabama, whose Kiowa blackberry plants have thrived for more than 25 years using this method, early trials at the LSU AgCenter Dean Lee Research and Extension Center are showing promising results. This longevity is notably longer than the typical lifespan of

commercial blackberry plantings, which generally last around 10 to 20 years.

The benefit of the TPUPS method is that by suppressing primocanes (the first-year growth of blackberry plants) until late in the season, more sugars are dedicated to fruit production, making the plants easier to manage and harvest. If disease issues do arise, the plants are easier to spray. Less bushy growth makes the fruit easy to pick.

SETTING UP THE TRELLIS SYSTEM

All blackberries benefit from being grown on a trellis system, which helps keep plants manageable and easy to harvest. The range of trellising options varies from casual cattle panels (gridded fence panels) to comprehensive commercial setups. One of the perks

of the TPUPS method is that it utilizes a trellising system that is economical for commercial growers and easy to install for residential homesteads. However, it is worth noting that this method can be more labor-intensive than other trellising systems.

The TPUPS method uses a setup nearly identical to what is called an I-trellis, with wires positioned at 3 and 5 feet. The primary difference from the standard I-trellis is that canes are trellised on the wire more intensely, akin to grape production, rather than just providing support for upward-growing canes. To set up this system, growers will need sturdy posts, high-tensile wire and tensioners. Posts should be placed at regular intervals to support the weight of the plants, but fewer posts are needed compared to other systems

[Left] A blackberry plant grows on a trellis built using the Trellised Production Using Primocane Suppression (TPUPS) technique, which simplifies the harvesting process, significantly reduces disease pressure and makes growing thorny selections less prickly. Photo by Michael Polozola

[Right] A blackberry plant blooms at the AgCenter Dean Lee Research and Extension Center in Alexandria. Photo by Michael Polozola



because the plants are retrained every year, preventing a large mass buildup.

Spacing of the plants in this system is farther apart than in traditional blackberry cultivation due to the differences in the trellising techniques. Plants should be about 5 to 6 feet apart to maximize the fruiting area, which extends more horizontally than vertically.

PRIMOCANE SUPPRESSION TECHNIQUES

TIMING AND METHODS: The crucial part of the TPUPS method is training the plants properly from the start. It is important to begin with vigorous plants. The first year should focus on plant establishment, especially if starting from freshly rooted plants. In year two, or later in the first season, primocanes (fresh growth from that year) should be selected and trellised on the wire. Floricanes (second-year growth) must be pruned out every year, as they typically decline in vigor significantly in late June and July and eventually die, making them easy to identify for removal.

Another critical aspect of the TPUPS method is primocane suppression. For established plants, primocanes attempting to emerge from January to late May and early June need to be pruned off. This task must be performed several times a month. Primocanes are only allowed to come up later in the fruiting season (June to July) to train replacements for the next year. Only two primocanes will be selected, one for the 3-foot wire and another for the 5-foot

wire. It is important to do this process early, as a delay can lead to stunting if too many resources are spent on primocanes that are eventually pruned out.

Weeds are easy to manage in a TPUPS system through either conventional or organic methods. Because the plantings are managed without unrestrained primocane growth, they are easy to spray or maintain weed-free through mechanical means. Disease and insect management can be either preemptive or on an as-needed basis, depending on the goals of the planting. Commercial operations should consider a few applications of fungicides throughout the season, either organic or conventional, to prolong the longevity of the planting.

Plants will be much more vigorous and fruitful with proper irrigation. Fertilization is also important in maintaining vigor and production. Regular soil testing is recommended for commercial operations, but homeowners can fertilize with 0.25 pounds of nitrogen or 2.5 pounds of 10-10-10 fertilizer per plant.

BENEFITS: Primocane suppression leads to larger fruit that is easier to harvest because primocanes are not in the way. Additionally, disease pressure is greatly reduced in this system, especially viral diseases, leading to increased lifespan potential for the planting. It is not unusual for other cultivation methods to need replacement every eight to 10 years, while a Kiowa planting using the TPUPS method has been reported to thrive for at least 25 years.

SUCCESSFUL CULTIVARS

Among the blackberry cultivars tested, Kiowa and Ponca have shown exceptional compatibility with the TPUPS technique. These varieties thrive under the trellising system, producing abundant and high-quality fruit. Conversely, not all blackberry varieties are suited for this method. For instance, Caddo has not performed well at Dean Lee and has been removed. Sweetie Pie, introduced a year after Kiowa, Ponca and Caddo, is exhibiting promising results. There has been considerable interest in incorporating a primocane-fruiting blackberry variety into the TPUPS system. Prime-Ark Freedom has been added to answer those inquiries.

CONCLUSION

The TPUPS technique offers a promising approach to blackberry cultivation by addressing common challenges such as disease management and ease of harvest. By adopting this method, growers can potentially increase the lifespan and productivity of their blackberry plantings. With successful cultivars like Kiowa and Ponca, and ongoing trials with new varieties, the future of blackberry farming looks bright. As more growers explore and implement the TPUPS system, the benefits of this innovative technique will continue to unfold, inspiring a new era of efficient and sustainable blackberry production.

Michael Polozola, the AgCenter Extension state fruit and nut specialist, is stationed at the AgCenter Dean Lee Research and Extension Center in Alexandria.



ON THE HUNT FOR THE IDEAL *Strawberry* **FOR LOUISIANA HOME GARDENS**

■ MICHAEL POLOZOLA

IN THE SPRING OF 2020, a quest began to find the ideal strawberry variety for Louisiana home gardeners. With many people staying at home during this period, there was a significant increase in interest in growing their own food. It was noticed that many of these new gardeners had little to no experience with gardening. This led LSU AgCenter Extension personnel to brainstorm suitable introductory plants for beginners and ultimately deciding that strawberries would be an excellent choice.

WHY STRAWBERRIES?

For one, they are quick to enter production. You can plant a strawberry patch in the fall and have plenty of produce by spring. Many other fruiting plants require years of waiting. While that wait is worthwhile, new gardeners often want to see immediate results. A little success can help give them the enthusiasm to pursue more long-term gardening goals.

Another benefit of strawberries is their versatility in growing conditions. Traditionally, strawberries are grown in fields, but they can just as easily be grown in containers. This is great for beginners or those with limited space.

STARTING THE EXPERIMENT

With all of this in mind, the determination to start an experiment to find the ideal strawberry variety for home gardeners in Louisiana was strong. In preliminary research, it was noticed that most resources focused on annual commercial production. While this information is crucial for local producers to meet consumer demand, it didn't align with the needs of homeowners who want to plant strawberries once and enjoy them for many seasons.

Perennial production is more common in the northern United States but less so in the hot and humid South, where disease pressure is intense. Although strawberries can be grown fairly easily as an annual with proper disease management, they are actually quite challenging to grow as a perennial in Louisiana. Effective disease management is essential for successful annual cultivation, ensuring healthy plants and bountiful harvests. This was intriguing and contradicted the initial belief that they would be an ideal starter plant. Undeterred, research was doubled down on to find ways to make perennial strawberry cultivation feasible.

INITIAL TRIALS

When the strawberry experiment was initiated, a plethora of varieties was discovered that had never been heard of before. Although it was already late in the spring season, about 20 different cultivars were acquired to start with. As you can imagine, keeping track of 20 different named varieties was quite a task. Initially, terra-cotta pots in elevated stands were used with moderate success. The excitement of harvesting the

first batch of strawberries was memorable. Their sweet taste was incredibly rewarding and made the efforts of growing them worthwhile. Because they were grown at home, they could be allowed to get absolutely, completely ripe, which made their flavor so much richer than what could be bought at a grocery store. Over time, about 75 different named varieties were trialed, and growing towers were used to accommodate all the plants.

Despite the severe weather conditions in Louisiana, including hurricanes, extreme drought, ice storms and snow, some of these plants have shown remarkable resilience. Growing in containers and towers, they are less buffered against these elements, yet a handful of these selections have survived and thrived. Some have even endured containers that froze solid and still came through the other side.

THE SWAG METHOD

To determine which strawberry varieties to trial, the SWAG method — scientific wildly aimed guess — was employed. This approach involved a combination of research, intuition and practical considerations. Existing literature was reviewed, local experts were consulted and factors such as disease resistance, yield potential and suitability for Louisiana's climate were considered. This method allowed the narrowing down of the vast array of available varieties to a manageable number for the experiment.

However, even with this method, something similar to a shotgun approach was still employed. This means a wide range of cultivars were tried to see what would work best, rather than focusing on just a few. This trial-and-error process was essential in identifying the most suitable varieties for home gardeners in Louisiana.

CULTIVAR SELECTION

In the process, cultivars from a wide range of breeding climates were tried, though the focus was primarily on those from similar climates to Louisiana, like Florida and North Carolina. Occasionally, a variety was included purely because it was noted for its unique or extraordinarily sweet flavor profile. Overall, most cultivars were found to be better suited to annual cultivation. Despite this, a few showed signs of being suitable for perennial production.



Mara des Bois is one of the strawberry cultivars that performed exceptionally well in research trials. Despite being a French selection, it has proven to be a vigorous, heat-tolerant and disease-resistant variety over the past five growing seasons in Louisiana.

CHARLOTTE

Charlotte is a hybrid of Mara des Bois and Cal 19, combining the flavor of Mara with the productivity of Cal 19. This cross has resulted in a cultivar with a slightly taller and less dense growth habit than Mara des Bois, requiring less thinning. However, the reduced production of offshoots means it can take longer to propagate your own plants to fill a larger area. Additionally, the crowns of Charlotte require more care when dividing, as they can snap off more readily than other cultivars. Charlotte's fruit is consistently larger than those of Mara des Bois, without a significant reduction in flavor. When tasted side by side, Mara des Bois may be slightly sweeter at times, but often the difference is negligible. Like Mara des Bois, Charlotte is a day-neutral variety that produces fruit for much of the year. Furthermore, no significant decline in vigor has been observed over four years of cultivation, making it a dependable choice for extended productivity.

MARA DES BOIS

Mara des Bois is one of the cultivars that performed exceptionally well in the trials, much to the surprise of those conducting the experiment. It was initially included in the experiment because it was frequently mentioned as one of the best-tasting varieties. Despite being a French selection, it has proven to be a vigorous, heat-tolerant and disease-resistant variety over the past five growing seasons in Louisiana. Mara des Bois has a shorter growth habit and tends to grow in thick crowns, which need to be thinned and separated regularly to maintain productivity long-term. As a day-neutral selection, it produces fruit year-round, provided the temperatures and growing conditions are favorable. While it slows down during the peak heat of summer and the coldest parts of winter, it otherwise yields fruit throughout the year. One downside to this continuous production is that it results in smaller harvests at any given time, unlike June bearers that produce a large quantity of fruit in a short period. However, the exceptional taste of Mara des Bois makes it a highly desirable choice for home gardeners. Additionally, no significant decline in vigor has been observed over five years of cultivation, making it a reliable long-term option.





Éclair is a short-day plant that tends to produce for a longer period than many other short-day selections. While not as sweet as Mara des Bois or Charlotte, it is still sweeter than many selections you might buy in a grocery store.

ÉCLAIR

With a name like Éclair, you might assume it is a French selection, but it is actually an American one. Éclair is a short-day plant that tends to produce for a longer period than many other short-day selections. It has a vigorous, upright growth habit and produces a few runners each season, which can be used for light multiplication or to fill in any gaps from lost plants. It produces the largest berries of any of the recommended selections. Normally, large berries come with a significant reduction in flavor, but that is not the case with Éclair. While not as sweet as Mara des Bois or Charlotte, it is still sweeter than many selections you might buy in a grocery store. Although Éclair tends to decline in vigor over time, it remains productive for a good three years from the initial starting plants.

GALLETTA

Galletta is a short-day plant of moderate vigor but excellent yields developed in North Carolina. Its yield is impressive, but its flavor can be variable. There have been times when the fruit is mostly sweet, while at other times, it can be a bit tart. Galletta remains fairly productive for about four years before the plants decline in vigor. If you really enjoy it, you should be able to keep your patch going through propagating runners. If you want a large quantity of berries for processing, this might be the right plant for you.

All of these cultivars have their own merits. If you want a larger berry with good flavor, Éclair would be a good choice. If you need a large quantity of strawberries for jams or jellies, Galletta would be a good choice. Ultimately, if you are going to go through the effort to grow them at home, which can be more costly, you might as well choose one that tastes good enough to justify the extra time and expense. For that reason, Mara des Bois and Charlotte would be the best choices.

CONCLUSION

The work on this endeavor is not finished. There is always a search for new selections with potential to try. This year, another French selection, Garriguetta, was requested from the U.S. Department of Agriculture and should be reviewed once enough of it can be propagated. The journey of discovering the ideal strawberry varieties for Louisiana home gardeners is ongoing, and each new season brings fresh opportunities and challenges. By continuing to experiment and share findings, the aim is to help fellow gardeners enjoy the sweet rewards of growing their own strawberries, no matter the conditions.

Michael Polozola, the LSU AgCenter Extension state fruit and nut specialist, is stationed at the AgCenter Dean Lee Research and Extension Center in Alexandria.

Charlotte is a hybrid of Mara des Bois and Cal 19. This cross has resulted in a strawberry cultivar with a slightly taller and less dense growth habit than Mara des Bois, requiring less thinning. However, the reduced production of offshoots means it can take longer to propagate your own plants to fill a larger area.

**THESE FLORIDA BRILLIANCE
STRAWBERRY PLANTS SHOW
SYMPTOMS OF NEOPESTALOTIOPSIS.**

Photo by Mary Helen Ferguson

KEEPING AHEAD OF STRAWBERRY DISEASES: *LSU AGCENTER WORKING WITH STRAWBERRY GROWERS TO MANAGE NEW DISEASE*

■ MARY HELEN FERGUSON

LOUISIANA STRAWBERRY FARMERS regularly contend with a multitude of challenges, including labor costs, unfavorable weather conditions, insect and mite pests, and plant diseases. In February 2022, a new-to-Louisiana disease was identified when a Tangipahoa Parish strawberry grower asked me to look at a field where plants were dying. To some extent, the symptoms resembled those of other common strawberry diseases, but the combination of collapsing plants with distinctive leaf spots was unusual.

The fungal spores I observed under a microscope immediately caught my attention. They appeared to be those of a pathogen, *Neopestalotiopsis* sp., that had been recognized several years before in Florida as the cause of a consequential strawberry disease called Pestalotia leaf spot and fruit rot. Because closely related fungi have spores that look similar but do not cause the same disease, a plant sample was sent for DNA sequence-based confirmation of the pathogen.

Within a day of when the farmer called attention to the problem, information was sent to strawberry growers and LSU AgCenter colleagues about the disease, with information on symptoms and what was known about how to manage the disease.

Since then, my fellow LSU AgCenter Extension agent Clark Robertson and I have worked to keep abreast of research findings about the disease and to educate growers about how to manage it. Besides working one-on-one with growers and providing updates by email, we held meetings for strawberry growers in July of 2023 and 2024 to provide education about managing this disease and other topics of relevance. Each time, the United States' leading specialist on the disease, Natalia Peres of the University of Florida, joined the group via video conference to answer growers' questions.

Robertson and I have participated in a project led by the University of Georgia to find out what strains of the *Neopestalotiopsis* fungus are involved

in the disease in the southeastern U.S. Nine of 10 samples tested from Louisiana during the 2023–2024 season were the originally identified aggressive strain. Led by extension specialist and Plant Diagnostic Center director Raghuwinder Singh, the LSU AgCenter recently released a new fact sheet about the disease titled *Neopestalotiopsis* Leaf, Fruit and Crown Disease of Strawberry.

Besides leaf spots and eventual plant collapse, this aggressive strain of *Neopestalotiopsis* sp. causes spots on fruit, which make it unsellable. Some plants with infected crowns show leaf reddening before leaf spots or fruit rot are obvious. Like many plant pathogens, the *Neopestalotiopsis* sp. fungus can survive on diseased plant tissue left in the field. University of Florida research has shown that the pathogen can survive for at least 17 months in intact strawberry crowns. Because of this, growers should practice crop rotation if possible. Crop rotation — or moving where a given type of plant is planted from year to year — is a good practice for managing many

**A DISEASED STRAWBERRY FRUIT HAS
A LIGHT BROWN SUNKEN LESION
CAUSED BY NEOPESTALOTIOPSIS
FRUIT DISEASE.**

Photo by Raghuwinder Singh



diseases. However, because of space and logistical limitations, many growers plant in the same field in consecutive years. When this is done, practices to reduce the population of the pathogen are especially important.

Removing plants from the field is preferable but may not be practical. If plants are left in the field at the end of the season, implements such as disk harrows that chop up plant materials should be used so that they will break down faster. Fumigation with a combination of 1,3-dichloropropene and chloropicrin can substantially reduce *Neopestalotiopsis* sp. populations in the soil, and fumigation has an important role in managing this disease. However, because fumigants are typically only applied in the raised rows, the fungus can survive in row middles.

It is important that growers acquire clean plants from reputable nurseries, and plants diagnosed with *Neopestalotiopsis* sp. prior to planting should not be used. However, symptoms are not always apparent at this point. The LSU AgCenter Plant Diagnostic Center plans to offer rapid turnaround testing prior

to planting in the upcoming season to identify infected plants before they go in the ground.

If *Neopestalotiopsis* is suspected, growers should contact their AgCenter Extension agent. Laboratory-based confirmation is needed because several other strawberry diseases have similar symptoms. If the pathogen is identified on the farm, good sanitation is critical. Areas with the disease should be worked in last, and equipment, clothing (including footwear) and hands should

be cleaned before moving to other areas. People should avoid working in fields when plants are wet from rainfall or dew because the fungal spores spread in water.

Sampling of row covers that growers use to protect flowers and fruit from cold temperatures revealed that *Neopestalotiopsis* sp. can survive on soiled areas of the row covers. They may play a role in spreading the fungus and creating an environment more favorable for disease, though growers who use wire hoops to



A DISEASED STRAWBERRY PLANT SHOWING REDDENING OF LEAVES.

Photo by Raghuwinder Singh

hold up row covers may have a lower risk of spreading the fungus because of reduced contact with plants. Exposure to temperatures of 104 F and hotter has been shown to reduce survival of *Neopestalotiopsis* sp. spores, so practices such as storing row covers in closed metal tractor trailers during the summer may be beneficial if row covers will be reused.

Fungicides do not provide complete control of *Neopestalotiopsis*, but Switch (cyprodinil and fludioxonil) and thiram are

considered the most effective options. Each can only be used a certain number of times in a season, as indicated on their labels. Switch should be used when conditions are most favorable for disease. Rhyme (flutriafol) and propiconazole (Tilt and others) provide some suppression of *Neopestalotiopsis*, as well.

Neopestalotiopsis continues to pose challenges to strawberry growers, but growers have learned to recognize symptoms of the disease and have

learned much about how to manage it, including the importance of sanitation practices and what fungicides are effective.

Problematic diseases are not new to strawberries. Besides *Neopestalotiopsis*, farmers contend with disease issues like grey mold (*Botrytis* sp.), Phytophthora root and crown rot, and anthracnose fruit rot. The fungi that cause grey mold readily develop resistance to fungicides when products with the same modes of action are used repeatedly. Robertson and I have participated in projects to test for fungicide resistance so that we can let growers know what fungicides remain effective for this disease.

Agriculture requires continual vigilance for the arrival of new diseases and arthropod (insect and mite) pests. The LSU AgCenter addresses emerging issues that threaten Louisiana crops so farmers can continue to produce them economically and so local fruits and vegetables remain available to Louisiana consumers.

Mary Helen Ferguson, an AgCenter Extension agent focusing on horticulture, is based in Tangipahoa Parish.

Blaise Pezold produces several hundred trees each year at Docville Farm in Violet, Louisiana, within the Fruit Under Screened Environments (FUSE) facility.

Photo by Blaise Pezold



PAWPAWS:

AN OLD NATIVE WITH RENEWED INTEREST

■ ANNA E. TIMMERMAN AND BLAISE PEZOLD

THE PAWPAW (*Asimina triloba*), America's largest native fruit, is experiencing a resurgence of interest from chefs, brewers and native plant enthusiasts. The LSU AgCenter has been encouraging the cultivation of pawpaws in Louisiana through an annual Pawpaw Symposium in partnership with the Meraux Foundation and through extension education outreach to specialty crop producers looking to diversify their offerings.

This tasty fruit was once an important food source for indigenous peoples in North America. The fruits are oval shaped with thin skin, and inside, its custardlike flesh tends to be orange, yellow or cream colored with several large, inedible black seeds. The fruits vary in size, with some as large as potatoes while others are finger sized. Pawpaws spread outside of their native historical range thanks to the help of

people and wildlife, driven by the flavor that can be similar to a mango, banana or even vanilla. Pawpaws can be found along waterways and in forests, usually in rich, loess-type soils. They grow throughout Louisiana from Shreveport to Avery Island and find their way into orchards and backyards almost in a frenzy. Independent garden centers statewide have difficulty keeping them in stock due to high demand.

Pawpaws are difficult to ship because of their thin, easily damaged skin and have a short two-to-three-week harvest season, making them an elusive treat that never developed a widespread commercial system. Chefs, brewers and bakers looking to highlight local foods and interesting flavors seek them and pay high prices for the opportunity to give people a taste. You can find cleaned pawpaw pulp for sale online for \$12

[Top] Pawpaw trees grow at the grow at the Docville Farm in Violet, Louisiana. Photo by Kyle Peveto

[Bottom] Pawpaws have a relatively short harvest window and are difficult to ship or store compared to other fruits, but the wonderful, elusive flavor drives demand. Photo by Blaise Pezold



to \$15 a pound. The renewed interest in home food production has also resulted in an increasing number of garden centers carrying these fruit trees, often at a premium price.

Professional horticulturists, chefs, home growers and others interested in pawpaws have gathered each December in recent years at the annual Gulf South Pawpaw Symposium at the Meraux Foundation's Docville Farm in Violet, Louisiana. More than 125 attendees from across the Gulf Coast region attended the 2024 symposium, and participants went home with at least two trees to plant. The trees are named for the indigenous tribes, such as Chitimacha, who historically lived in the places where the pawpaws are found. These locations are a rare repository of truly Southern wild genetics.

The majority of national pawpaw breeding and cultivation has taken place in northern states of Appalachia and the Great Lakes. In the 1990s, retired LSU AgCenter horticulturist Charles Graham did some trial work on pawpaws, and some trees remain at the LSU AgCenter Botanic Gardens at Burden. The pawpaw was largely forgotten as a Louisiana specialty crop until recently. The Meraux Foundation and the AgCenter are working to spread pawpaws to fruit growers statewide, intending to identify strong, productive locally bred cultivars adapted to Southern growing challenges.

Especially productive or tasty cultivars are typically grafted using scion wood and hardy, local wild rootstock. Pawpaws require at least two trees to cross-pollinate. Single trees may produce suckers, but these are genetic clones of the parent and will typically not bear successfully. Seeds must be cold stratified for three to four months before planting after collecting them from the fruits and not allowed to dry out. If they do dry out, germination will be severely reduced. When purchasing seeds, they should be shipped in moist potting media or peat moss to keep them viable.

There are several reputable online vendors offering seeds, scion wood and starter trees of both named cultivars and promising wild selections. Kentucky State University maintains a list of nurseries that carry pawpaws. Many independent garden centers are also beginning to carry pawpaw trees featuring Southern-adapted cultivars and genetics. These trees are derived from productive Louisiana wildstock and are adapted to our climate. They can be used to produce fruits or used



as grafting rootstock for named cultivars. Plant pawpaws during the dormant season as this will give the roots a good chance of establishing well before summer.

Pawpaws are naturally understory trees and benefit from shade protection, especially when young and newly planted. Use a 30% to 40% shade cloth covering, which helps to protect the young trees from sun exposure and can be gradually removed to acclimate them after two years of growth. Pawpaws begin to fruit around four to six years after planting but may take up to 10 years. Pawpaws are the host plant for the zebra swallowtail butterfly, which will lay eggs on the leaves and cause a little feeding damage. These caterpillars are not considered to be pests, and pawpaws have little to no disease or pest issues known.

Pawpaws are experiencing a resurgence of interest in Louisiana and may be a good addition to the home orchard. Though a little difficult to source, once established pawpaws provide a sweet reward that can't be bought at the grocery store. The fruits can be eaten when ripe or turned into ice cream, baked goods and even beer.

Anna Timmerman is an AgCenter Extension agent for St. Bernard and Plaquemines parishes and is the state point of contact for citrus fruits. Blaise Pezold is the coastal and environmental program director at the Meraux Foundation.



Each December, the Gulf States Pawpaw Symposium draws enthusiasts and growers from several states. Each person receives two free pawpaw trees to take home and plant. Photo by Blaise Pezold

TO LEARN MORE about growing pawpaws or to get added to the Gulf South Pawpaw Symposium contact list, please email Anna Timmerman at atimmerman@agcenter.lsu.edu or Blaise Pezold at blaise@merauxfoundation.org.



Photo by Kyle Peveto

BLAISE PEZOLD, pictured above, is the coastal and environmental program director for the Meraux Foundation, a charitable organization based in St. Bernard Parish. Pezold developed an interest in pawpaws while working as a chef. An avid forager, he would harvest wild-grown fruits and trade or share them in the New Orleans area.

"It's the largest fruit native to North America, so we should be growing it," Pezold said. "We probably should have been growing it down here for hundreds of years."

Over time, he has developed a knack for finding wild pawpaw patches and germinating and growing large 2-year-old trees from the seeds. He now produces several hundred pawpaw trees annually and gives them away to attendees of the annual Gulf South Pawpaw Symposium.

"I saw a whole lot of interest and people wanting information, and I was already growing them out here," he said about founding the symposium with AgCenter Extension agent Anna Timmerman. "It feels easy to talk about if you know people want to learn."

NATIVE PAWPAW TREES TEACH SEVERAL LESSONS AT DENHAM SPRINGS JUNIOR HIGH

■ KYLE PEVETO

IN JUSTIN RAYBURN'S horticulture course at Denham Springs Junior High, pawpaws make appearances throughout the curriculum.

Students learn about several fruits and vegetables through the class, which features a great deal of hands-on work in the garden in addition to classroom lessons.

But the pawpaw, a native fruit tree that grows easily in Louisiana but is not well known, teaches them the most, Rayburn said.

"The potential for teaching or making concepts real is very easy with pawpaws," Rayburn said. "They're so different, and kids are drawn in by just the potential for tasting one and the knowledge of them."

Growing pawpaws gives Rayburn a reason to teach students about plants that have tap roots and about a tree's cambium layers, which he shows them when they learn to graft the trees by splicing a section of a desired tree onto the root system of another tree. He also uses the pawpaw to teach how flies help with pollination and that the zebra swallowtail butterfly relies on the tree to live and reproduce.

"You're constantly reinforcing horticulture concepts through one tree," Rayburn said. "For us, it has become like an anchor plant."

In 2021, Rayburn started teaching when he took a temporary horticulture and aquaculture job after spending a few years working overseas for a service-oriented nonprofit. When the position became permanent, he began looking for interesting ways to teach horticulture, and his research led him to pawpaws.

At the 2022 Gulf South Pawpaw Symposium organized by the Meraux Foundation in Violet, Louisiana, Rayburn learned more about these fruit trees from AgCenter Extension agents who spoke and from Blaise Pezold, the foundation's coastal and environmental program manager who spearheaded the event. Rayburn left with four trees, and then he found help from Charles Overstreet, LSU AgCenter professor emeritus, a plant pathologist who became fascinated with pawpaws decades ago.

"I love fooling with pawpaws and grafting, so I became serious about grafting new varieties, and, next thing you know, I've got a yard full of pawpaws," said Overstreet, who now grows more than 30 varieties in his orchard.

Overstreet has visited Rayburn's class regularly over the past three years to teach the students about pawpaws in the classroom and then guide them through a grafting lesson. He enjoys spreading the word about this fascinating native American tree that so few people recognize.

"How would you have heard of it? It's not in the grocery store. They grow in the woods, and they get ripe in July and August. Here in Louisiana, that's when you get eaten up by mosquitoes and everything else," Overstreet said.

Children are highly motivated to learn about these obscure fruits and to learn the new skill of grafting, Rayburn said.

"With pawpaws, they become the experts, and for a kid, that's huge. They can say, 'I know this, and I'm sharing the information with an adult.' That's a big deal," Rayburn said.

Those students share that information with their parents, and Rayburn envisions a few of those parents seeking out a pawpaw tree for their yards.

"We have the potential to open everyone's eyes," Rayburn said, "and it's catching on."

Kyle Peveto is the editor of Louisiana Agriculture.



Charles Overstreet, LSU AgCenter professor emeritus, teaches Denham Springs Junior High students to graft pawpaw trees. Photo by Kyle Peveto



BLUEBERRY DEMONSTRATION AT HAMMOND RESEARCH STATION

ALLOWS PEOPLE TO SEE HOW VARIETIES PERFORM IN SOUTHEASTERN LOUISIANA

■ MARY HELEN FERGUSON

BLUEBERRIES, like many cultivated fruits, come in numerous varieties or cultivars. These differ with respect to where they grow and fruit well. An ongoing LSU AgCenter demonstration orchard at the Hammond Research Station is helping educate Louisiana growers about how different blueberry varieties perform and how they can successfully grow blueberries.

One of the factors that determines what varieties are productive in a given location is the chilling requirement needed to break dormancy. Varieties that require too many chilling hours for a location will not fruit well on a regular basis, while ones that require too few are likely to flower too early and have flowers or young fruit killed by a late freeze.

The blueberries that have typically been planted in gardens in the Deep South are rabbiteye blueberries (*Vaccinium ashei* or *V. virgatum*). These plants are forgiving of less-than-ideal soil conditions and can live for many years. Common varieties include Premier, Tifblue, Climax, Brightwell and Powderblue. These five have been around for many years. A number of newer varieties released in the past 35 years have expanded the range of options, but some of these have not been widely evaluated in Louisiana.

Besides new rabbiteye cultivars, there are also Southern highbush blueberry varieties. These are crosses between the northern highbush blueberry (*V. corymbosum*) and other native blueberry species, such as *V.*

darrowii. These generally fruit earlier than rabbiteye varieties and dominate the commercial blueberry industries in states like Georgia, Florida and North Carolina. However, they are more finicky about soil conditions than rabbiteye blueberries. Having an appropriate soil pH and good drainage are critical when growing these. They also tend to be more susceptible to plant diseases.

A Hammond Research Station demonstration established in the fall of 2020 has provided opportunities to observe the performance of five “old standard” blueberry varieties alongside 12 newer rabbiteye and related varieties and 13 Southern highbush blueberry varieties. While the main purpose of this planting at the Hammond Research Station is to demonstrate the perfor-

Rabbiteye blueberries grow at a blueberry variety evaluation at the LSU AgCenter Hammond Research Station. Photo by Olivia McClure

mance of different blueberry varieties in our climate, one of its major uses has been to teach people how to prepare the soil for planting blueberries.

Plant survival has been excellent. Of 93 plants (three of each of 31 varieties), one plant of the rabbiteye variety Centurion has died. The 2023 season, when the site experienced 26 F on March 20, was an especially useful one for learning what varieties are more likely to produce in years with late freezes. Of the old standards, Brightwell was a clear winner in terms of producing despite the freeze. Among other rabbiteye varieties that typically ripen in the early to middle part of the season, Austin, Columbus, Alapaha and Tifblue also fared relatively well. Among ones that tend to ripen later, Centurion, DeSoto and Ochlockonee had respectable amounts of fruit. The only Southern highbush variety that stood out for producing despite the late freeze was Gupton.

In 2024, Louisiana Master Gardener volunteers helped harvest fruit to collect yield data. It is important to note that this is a demonstration rather than a research study. To be legitimate research, varieties would need to be replicated randomly within the area so

that we could be confident that differences were due to the varieties themselves and not to soil conditions in the spot where a variety was planted or other variables. Nevertheless, collecting yield data from this demonstration does provide some useful information. Tifblue and Ochlockonee were the top-yielding rabbiteye cultivars, while Legacy and Pearl were the highest yielding Southern highbush cultivars. For more detailed yield information, see results below.

HAMMOND RESEARCH STATION BLUEBERRY DEMONSTRATION RESULTS

Values are yield per plant averaged over all plants of that variety.

RABBITEYE BLUEBERRY CULTIVARS

– Top 10 Producers in 2024 –

- Tifblue 19.2 lbs.
- Ochlockonee 18.3 lbs.
- Brightwell 17.5 lbs.
- Premier 12.2 lbs.
- Austin 12.1 lbs.
- Alapaha 9.6 lbs.
- Powderblue 9.1 lbs.
- Centurion 8.5 lbs.
- DeSoto 6.8 lbs.
- Vernon 6.8 lbs.

SOUTHERN Highbush CULTIVARS

– Top 5 Producers in 2024 –

- Legacy 8.4 lbs.
- Pearl 6.2 lbs.
- Gupton 6.1 lbs.
- Farthing 4.6 lbs.
- Suziblue 3.8 lbs.

Southern highbush blueberries planted at the AgCenter Hammond Research Station are being monitored in a long-term evaluation. Photo by Mary Helen Ferguson



Varieties varied a great deal with respect to when fruit ripened. Most Southern highbush varieties — Camellia, Colibri, Emerald, Farthing, Gupton, Keecrisp, Miss Lilly, Paloma, Patrecia, Pearl, Suzibue and Star — had ripe fruit by the end of April or beginning of May. Legacy, the highest yielding variety, did not start producing in mid-May, comparable to some of the earliest rabbiteyes.

Only dates when an average of at least 10 grams per plant was harvested from a variety were counted.

Robeson and Pink Lemonade, which have both Southern highbush and rabbiteye genetics in their backgrounds, started fruiting in the second week of May, and the rabbiteye varieties Austin, Brightwell, Krewer and Vernon started producing in mid-May. Of these, Austin

and Brightwell fruited through the last harvest on July 8.

Harvest of a number of rabbiteye varieties — Alapaha, Climax, Delite, DeSoto, Powderblue, Premier and Titan — began on May 20. Columbus started a few days later. All of these except Titan continued fruiting till near the end of June or first of July. Ochlockonee and Tifblue started fruiting in late May and were still producing at the last harvest in early July. Onslow and Centurion began June 6, which was the latest, and produced through the last harvest.

Yields of the earliest ripening varieties were generally unimpressive, but this was not solely the fault of the varieties. When there were fewer berries, as there were at the beginning and end of the season, birds likely consumed a larger proportion of them. A few of the earliest varieties also had small amounts of fruit before yields were documented. A second year of harvesting is planned to have two years of yield data.

Attempting to grow fruit plants, commercially or at home, can result in abundant harvests and great satisfaction or in wasted money and disappointment. The LSU AgCenter provides information to help people make decisions that will increase their chances of success.

Mary Helen Ferguson, an AgCenter Extension agent focusing on horticulture, is based in Tangipahoa Parish.

SITE PREPARATION FOR BLUEBERRY DEMONSTRATION AT THE AGCENTER HAMMOND RESEARCH STATION

Rabbiteye blueberries can produce for many years and with relatively little care if a good site and appropriate varieties are chosen and the soil is prepared well. Full sun exposure, good drainage and a soil pH around pH 4.5 to 5.2 are desirable, although rabbiteye varieties can tolerate slightly higher pHs (up to about pH 5.5).

To prepare the demonstration at the LSU AgCenter Hammond Research Station site for planting, aged pine bark was spread to a depth of 2 to 4 inches in a 3-foot-wide strip on rows where rabbiteye varieties would be planted. Where Southern highbush plants would be, the mulch depth was increased to 4 to 6 inches. Mulch was rototilled into the soil, and the soil-bark mixture was hipped into raised rows with discs pulled by a tractor.

After planting blueberries (6 feet apart for rabbiteye plants and 4 feet apart for Southern highbush plants), additional pine bark was spread on the tops of rows for weed management. Blueberry plants have shallow root systems, and it is important to keep turfgrass and other weeds away from the bases of the plants, especially while they are getting established.

Drip irrigation tubing was installed after planting and before applying the surface mulch layer. This is an option for home gardens as well, but is not absolutely necessary. In a small planting, watering can be done by hand while plants are getting established and during dry periods.

The period between late fall and early spring is a good time for planting containerized blueberry plants, as this allows them to grow roots before summer heat arrives. Bare root plants should be planted while dormant. Plant at least two varieties for cross pollination.

Southern highbush varieties tend to be more finicky about soil conditions, and the early-fruited ones are likely to have flowers killed by late freezes in many years. One option is to plant these in 10- to 15-gallon pots with aged pine bark as the substrate. This will require more attention to watering and fertility than if they were planted in the ground, but it allows a person to move them into a protected area during late freezes.



AN UNNAMED APPLE IN UNION PARISH RIPENS IN MID-JULY. THIS TREE IS A ROOT SPROUT FROM A TREE BROUGHT TO LOUISIANA FROM ALABAMA IN THE EARLY 1900s.

Photo by Kerry Heafner

DON'T GIVE UP ON APPLES

■ KERRY HEAFNER, MICHAEL POLOZOLA AND KYLE PEVETO

CONTRARY TO POPULAR BELIEF, apple trees (*Malus domestica*) can grow and produce fruit in Louisiana. In fact, apples have historically prospered in home orchards throughout much of the state. A century ago, Louisiana nurseries marketed a wide variety of apple trees recommended for Louisiana home orchards. Today, only a few apple varieties with comparatively low chill requirements are marketed to home growers in Louisiana. Fueled by a renaissance in old Southern varieties, the LSU AgCenter's efforts to identify and test old Southern apple varieties are paving the way for better, tastier options for modern home orchards.

European colonists brought the first apple seeds to North America in the 1600s. By the early 20th century, there were an estimated 17,000 named apple cultivars in circulation. Today, only a few hundred of those old varieties remain available. Before railroads, an interstate trucking system and modern fruit storage allowed for a steady supply of apples from Wash-

ington, Michigan and New York to be delivered to the rest of the nation, most farms and homesteads in the southern United States, including the Deep South, kept a small fruit orchard, and apples were a popular crop. A century ago, apples were a more versatile, utilitarian crop than today. Rather than raising apples merely for fresh eating, home growers prized apples for making cider, frying, baking in pies and cakes, and drying to store for wintertime sustenance. Farmers also used them to feed horses, pigs and other livestock.

Unfortunately, trees from this era are mostly gone except for the few that have survived descendants selling off farmland and urbanization. A few old apple trees have been found in northern Louisiana. One apple tree in Union Parish is a root sprout off a tree brought to Louisiana from Alabama in the early 1900s and consistently produces beautiful red apples that ripen in July.

Cultivating apples in Louisiana demands diligence because of high maintenance needs from pest and disease pressure. Apples are mostly self-infertile, an adaptation in flowering plants to prevent inbreeding. To produce fruit, plant two varieties that flower at the same time for cross-pollination. Also, apples don't breed true. Apple seeds will germinate and produce trees that eventually bear fruit, but the chances of the fruit being the same variety the seeds came from — much less a desirable variety — are about 1 in 10,000. To ensure pure genetics, apple trees are propagated by grafting, which involves joining a 1-year-old piece of the desired variety (the scion) to a root system (the rootstock) of another variety. Most grafted apple trees will take two to five years to produce fruit once planted.

Many of the modern commercial varieties available in grocery stores will not produce in Louisiana because they are adapted to more northern climates. To produce fruit, varieties like Honeycrisp and Cosmic Crisp require more chill hours, which are hours with a temperature below 45 F, than most areas of Louisiana get in an average winter. Chill requirements are not known for most heirloom apple varieties that commonly grew in the state 120 years ago. Nursery catalogs of the time didn't mention chill hours, nor were they mentioned in early Louisiana State Horticulture Society meetings where apples

were discussed by leading nurserymen of the day like John DeLee of East Feliciana Parish and Arthur K. Clingman of Claiborne and Caddo parishes.

So, which apples should Louisiana growers try? LSU AgCenter agents are trying to answer this question. Scion wood has been collected from old trees in Jackson, Ouachita and Union parishes and grafts have been made of these “old soldiers.” Other apples with origins in the Deep South — including Shell of Alabama, a Mississippi apple called Sam

Hunt and an apple from the Houston area called Reverend Morgan — are being tested. The old Horse apple, which was likely the single most commonly grown apple throughout the South at one time, has shown to do well in northern Louisiana in previous years as has Summer Banana, an apple from South Carolina. During the late 1800s, an old Russian apple called Red Astrachan was reported as productive at the North Louisiana Experiment Station in Calhoun, which was later named the AgCenter Calhoun Research Station. Three familiar supermarket apples, Fuji, Gala and Granny Smith, all require the same number of chill hours that many areas of northern and central Louisiana may receive but have not garnered much attention in the state.

Apples still have promise in today’s Louisiana home orchard. As nursery owner John DeLee told us in 1904, variety selection, soil type, site selection and proper pruning and cultivation are all key factors. This is still true in the 21st century. Nursery owner Arthur Clingman emphasized the value of apples in 1905, stating, “I believe that apples are one of the best paying crops that can be grown — not from a commercial standpoint — but they are a valuable crop.” Historical evidence and ongoing research demonstrate that apples can thrive in Louisiana home orchards once again.



THE OLD HORSE APPLE WAS COMMON THROUGHOUT THE SOUTH AT ONE TIME. HORSE IS A TART SUMMER APPLE.

Photo by Kerry Heafner

Kerry Heafner, an LSU AgCenter Extension agent focused on horticulture, is based in Ouachita Parish. Michael Polozola is the state fruit and nut specialist, and Kyle Peveto is the editor of Louisiana Agriculture.

MCMULLEN: NORTH LOUISIANA’S LOST APPLE

■ KERRY HEAFNER

SEVERAL SOUTHERN APPLE VARIETIES have origins in Louisiana. Apples such as Bossier Greening, Felt’s Strawberry, Louisiana, McMullen, Pride of the South, Terral and Woodland are all extinct, according to C. Lee Calhoun in his magnificent book, “Old Southern Apples.” If even one stands a chance of being rediscovered, it is the McMullen apple. It left a blazed trail for us to follow.

Joseph Cullen “Joe” McMullen was born in Kimble County, Texas, in 1844. He eventually married and settled his family in DeSoto Parish near Stonewall. At age 19, McMullen was wounded in the Battle of Mansfield fighting for the Confederate Army. His wounds troubled him for the rest of his life. McMullen was a cotton farmer in his postwar years. And he grew apples.

In 1888, McMullen purchased a bundle of fruit tree whips from a nursery salesman, and some of the whips were apple trees. Seven years later, six of the surviving trees produced a crop of quality apples. McMullen said he thought he had initially purchased seedlings. However, apples rarely breed true from seeds, and all his trees produced the same apple. McMullen had most likely

purchased root sprouts taken from a single, nongrafted tree.

In 1904, Major Jordan G. Lee Sr., then commissioner of the Louisiana Bureau of Agriculture and Immigration, which would become Louisiana Department of Agriculture and Forestry, encouraged McMullen to exhibit his apples in the Louisiana Purchase Exposition, the 1904 St. Louis World's Fair. By this time, McMullen's health would not allow long-distance travel, but he arranged to ship his apples to St. Louis. His efforts didn't go unrewarded. McMullen apples were exhibited along with other fruits from Louisiana and won a bronze medal.

Also in 1904, the McMullen apple was selected by the U.S. Department of Agriculture for inclusion in its collection of watercolor paintings by renowned botanical artist Deborah Griscom Passmore, who contributed more than half of the 7,500 pomological watercolor paintings commissioned by the USDA in 1887. Artist Bertha Heiges contributed a second painting of the McMullen apple in 1905. So, we know exactly what the McMullen apple looked like.

In January 1905, when the Louisiana State Horticultural Society met in Shreveport, John Massengale Nelson Sr., the county agent in DeSoto Parish, gave a presentation on this new Louisiana apple on Joe McMullen's behalf. In his question-and-answer session, Nelson was asked if the apple may be of commercial value in Louisiana. He reported that McMullen "gathered from five to nine bushels to the tree off six trees and sold them in Shreveport at \$1.35 per bushel." Nurseryman Arthur Clingman of Keithville, just north of Stonewall, spoke highly of McMullen and agreed that while apples may not be a commercial crop in Louisiana, they were certainly a valuable crop for home orchards. Interestingly, Joe McMullen's apple doesn't appear in any of Clingman's catalogs, which were published well into the 1920s.

McMullen died on Feb. 17, 1906, aged 61. Nelson took over propagating the apple for the McMullen family and is

listed in an advertisement printed in a Shreveport newspaper as the point of contact for McMullen apple trees: \$1 each or \$10 per dozen. On Feb. 21, 1908, one of McMullen's daughters, Harriette Belle "Hettie" McMullen, gave another presentation on the McMullen apple to the Louisiana State Horticultural Society. Hettie McMullen, not quite 18 years old, said a lot that day. She reread Nelson's paper from three years prior, but also said the original six McMullen apple trees were still healthy and productive and stood about 15 feet tall. Hettie McMullen also reported that 1,000 trees had been grafted in 1906 and, in November of that year, an orchard of 450 of those trees had been established, presumably by Nelson. Finally, she said 2,500 McMullen apple trees were grafted in

1907 and 6,000 trees in 1908. Several trees evidently wound up in LSU's trial orchard at the Baton Rouge State Experiment Station but had not produced fruit by the time the 1908 orchard report was published as Louisiana Bulletin No. 112, October 1908. Fruit for the photograph in the report was likely obtained from either Nelson or the McMullen Family.

Nelson died on April 30, 1924, aged 77. Hettie McMullen Fincher lived 99 years. When she died on Feb. 2, 1990, so did the location of the orchard and the fates of all those grafted trees. There may still be an old McMullen apple tree hanging on somewhere, if only by root sprouts.

Kerry Heafner, an LSU AgCenter Extension agent focused on horticulture, is based in Ouachita Parish.



**THIS 1904
PASSMORE
PAINTING OF
THE MCMULLEN
APPLE APPEARED
IN THE USDA
POMOLOGICAL
WATERCOLOR
COLLECTION.**

Photo courtesy of the Library of Congress

SEE INSIDE

Growers have long sought the most productive pecan tree for Louisiana. For many, two Louisiana varieties are the best trees, according to fruit and nut specialist Michael Polozola.

SEE PAGE 12.

Citrus has thrived in south Louisiana for centuries. However, most of the state lies in an area that is susceptible to citrus-damaging freezes. AgCenter specialists are working on growing systems that can allow almost anyone to grow satsumas and other citrus fruits.

SEE PAGE 20.

Many Louisiana home fruit producers have given up on growing apples. AgCenter Extension agent Kerry Heafner has found varieties that can produce in many areas of the state, and he is searching for a historically great apple tree that prospered a century ago.

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