

LOUISIANA Agriculture

Vol. 65, No. 3, Summer 2022
Published Since 1957

Ensuring Our Future Through Scientific
Research and Education



TEA RESEARCH

*Yan Chen and other AgCenter researchers
help growing Louisiana tea industry.
SEE PAGE 14*

INTRODUCING MATT LEE

INTERIM VICE PRESIDENT FOR AGRICULTURE

Dear readers,

I am pleased to welcome you to this issue of Louisiana Agriculture and to have the opportunity to introduce myself. On Aug. 1, I began my appointment as the interim vice president for agriculture and dean of the College of Agriculture at LSU. This appointment comes after earning two graduate degrees from LSU and spending 18 years in various faculty and administrative positions here. It is a privilege to serve the statewide agricultural community in this capacity, and I look forward to listening, learning and leading.

The LSU AgCenter and the College of Agriculture together constitute the lion's share of agricultural research, extension and teaching functions conducted through the LSU System. Agriculture is one of the largest industries in the state and is, accordingly, one of the most significant parts of LSU's overall mission. LSU President William F. Tate IV recently announced the Scholarship First pentagon of priorities, and agriculture is front and center in the plan. The agricultural enterprise is critical to the state, and it is an essential part of LSU's impact on the state, nation and world.

Our top-flight faculty relentlessly engage in scientific innovation to develop new crop varieties, understand and manage soil and water quality, limit the detrimental impacts of invasive plants and animals, and ensure maximum, healthy yields. As importantly, our cooperative extension work serves as a vehicle to translate scientific innovations to the producers who provide us with food security and grow our economy. This system is robust, efficient and impactful. We have a longstanding tradition of serving our constituents, and this year we seek to amplify that impact for the betterment of our great state. If there are ways we can better serve you, please do not hesitate to reach out and let us know.

Sincerely,
Matt Lee

Matt Lee is the interim vice president for agriculture and interim dean of the LSU College of Agriculture.



MATT LEE

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Ensuring Our Future Through Scientific Research and Education

ON THE COVER: At a research plot at the LSU AgCenter Hammond Research Station, researcher Yan Chen and a team of horticulturists are studying the best ways to grow tea in Louisiana. Photo by Olivia McClure

2 INTRODUCING MATT LEE Interim Vice President for Agriculture

Matt Lee

4 AgCenter News

5 From Our Social Media

6 College of Ag News

7 New Faculty Profile: Carol Friedland Brings a Fresh Perspective to LaHouse

V. Todd Miller

8 Natchitoches 4-H Forestry Teams Succeed at State and National Contests

Randall Mallette

9 'Camp the Way It Should Be': 4-H Campgrounds Welcome Youth Back in Time for 100th Anniversary

Olivia McClure

12 4-H is a Family Affair

Kimberly Deville

14 Researching Tea in Louisiana

Yan Chen, Zhijun Liu and Javen Little

16 Can Tea Production Be 'Sweet' for Southern Growers?

V. Todd Miller

18 Farm to School Programs in Public School Districts: A Growing Interest With Challenges

Whitney R. McKinzie and Maria Bampasidou

19 Nondestructive Analysis on Agricultural Products Using Near-Infrared Spectroscopy

Kun-Jun Han, Buddy Pitman and Wink Alison

20 Fresh Ideas for Fresh Produce in the Local Food System

Cecilia Stevens and Ruthie Losavio

22 Growing Farmers, Growing Communities: LSU AgCenter Extension Programs Support Local Food Systems

Maria Bampasidou, Carl Motsenbocker, Marcus Coleman, Kathryn Fontenot and Sydney Melhado

25 Fighting Hurricanes and Pests, New Farmers Find Help in AgCenter Program

Kyle Peveto

26 'It Opened My Eyes': AgCenter Program Instills Confidence in New Farmer

Kyle Peveto

28 Transforming the Combine From a Weed Seed Spreader to a Weed Seed Predator

Lauren Lazaro

30 Applying Modern Technologies to Map Elevation Changes in Specialty Crop Fields

Phillip Lanza, Stacia Davis Conger, Jeffrey Beasley, Thanos Gentimis and Don La Bonte

32 Raising Pumpkins and Future Farmers

Kathryn K. Fontenot and Beth B. Putnam

34 Q&A: Violet Stockton

Kyle Peveto

35 Q&A: Benjamin Brock

Kyle Peveto



LSU AgCenter, Mendel University Reunite After COVID-19 Interrupts Partnership

After two and a half years of not being able to travel internationally, faculty, staff and students with the LSU AgCenter and Mendel University in the Czech Republic finally were able to reunite at an International Summer School in Baton Rouge in July.

The two institutions have had a strategic partnership since 2014 for a variety of initiatives, including student exchanges, internships, research projects, publications and events. Participants in the collaboration have kept in touch since the onset of the coronavirus pandemic via virtual meetings. **Olivia McClure**



Participants in the International Summer School visit a greenhouse at the New Orleans Botanical Garden. Photo by Annabelle Lang

Strahan Named LSU AgCenter Northwest Region Director

The LSU AgCenter has named Ron Strahan as the Northwest Region director. Strahan replaces Tara Smith, who was serving on an interim basis.

Strahan, an associate professor in the AgCenter School of Plant, Environmental and Soil Sciences, will oversee AgCenter personnel and programs in 12 parishes and three research stations. "I look forward to the opportunity to work with scientists and extension agents to improve the lives of our stakeholders in the Northwest Region," he said.

V. Todd Miller



LSU AgCenter weed specialist Ron Strahan has been named Northwest Region director. His appointment began Aug. 1. Photo by Anna Ribbeck

AgCenter, La. Sea Grant Unveil Seafood Processing Lab

The LSU AgCenter and Louisiana Sea Grant showcased a new Seafood Processing Demonstration Laboratory at the AgCenter Iberia Research Station.

On July 19, the organizations hosted a ribbon cutting for the facility located at 603 LSU Bridge Road in Jeanerette, Louisiana. The facility will offer seafood processors hands-on training with equipment that can be used to create value-added seafood products and add marketability to what is being caught in Louisiana's coastal and inland waters. **Derek Albert**



LSU AgCenter and Louisiana Sea Grant seafood specialists Tom Hymel and Evelyn Watts (center) cut the ceremonial ribbon at the new Seafood Processing Demonstration Laboratory located at the AgCenter's Iberia Research Station in Jeanerette. Photo by Derek Albert

AgCenter to Expand Bioproducts, Bioprocessing Research With New Grant

The Louisiana Board of Regents has awarded the LSU AgCenter Louisiana Institute for Bioproducts and Bioprocessing (LIBBi) a grant of nearly \$1 million to upgrade equipment for the institute. LIBBi and the scientists that work with it are dedicated to expanding and strengthening Louisiana's role in developing novel bioproducts and new technologies from the state's forestry and agricultural industries.

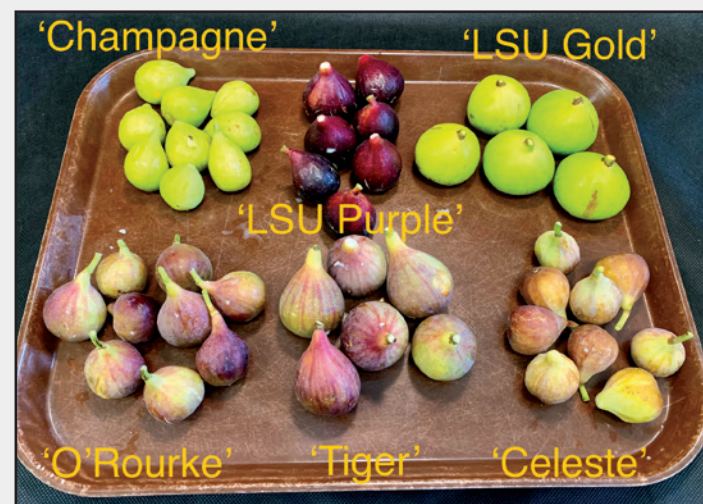
The long-term goal for this project is to develop LIBBi as a centralized facility within the LSU AgCenter and LSU Baton Rouge campus for coordinating research, teaching and technology transfer efforts in biocompounds, biopolymers, functional foods and nanomaterials from sustainable resources in Louisiana. **Tobie Blanchard**

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, Twitter, Instagram and LinkedIn. **Join the conversation by following the LSU AgCenter.**

INSTAGRAM | Follow the AgCenter at [instagram.com/LSUAgCenter](https://www.instagram.com/LSUAgCenter)

JULY 13 | It's fig season in Louisiana! The LSU AgCenter has a history in fig breeding that dates back to the 1950s. Five fig varieties have been released: Tiger, Champagne, LSU Purple, LSU Gold and O'Rourke.



TWITTER | Follow the AgCenter at twitter.com/LSUAgCenter

JULY 7 | Congratulations to our Louisiana 4-H Shooting Sports Team! They placed second in the nation at the National 4-H Shooting Sports Competition. 🍀

JULY 28 | Coach @KIMMULKEY and crew stopped by the LSU AgCenter Dairy Store for a sweet treat! Thank y'all for supporting the AgCenter!



FACEBOOK | Follow the AgCenter at [facebook.com/LSUAgCenter](https://www.facebook.com/LSUAgCenter)

JUNE 22 | Louisiana 4-H University is back at LSU this week! Some of the 4-H'ers chose to learn about turf management! Activities included learning how to paint Mike the Tiger on the field!



JUNE 23 | The Limelight hydrangeas (*Hydrangea paniculata*) are showcasing beautiful blooms this time of year. This is a Louisiana Super Plant that thrives in full sun to part shade. Learn how to grow them on the LSU AgCenter website (tinyurl.com/2p8cn78b).



YOUTUBE | View this video and our extensive archive at [youtube.com/user/LSUAgCenter](https://www.youtube.com/user/LSUAgCenter)

JUNE 22 | June is Healthy Homes Month, and to ensure that your home is less hazardous, homeowners need to take a critical look at their surroundings. LSU AgCenter correspondent Craig Gautreaux shows us ways to make our houses a safer space.

LSU Ag Econ Quiz Bowl Team Wins Back-To-Back National Championships

LSU won the 2022 Academic Bowl competition at the Agricultural and Applied Economics Association (AAEA) Annual Meeting.

The winning team members were Daniel Harris, Mimi Rivette and Michael Younis.

"It came down to sudden death, a single question to determine the winner, and we pulled through," said Jerrod Penn, assistant professor in the Department of Agricultural Economics and coach for the quiz bowl team.

Other teammates participating in the AAEA Academic Bowl competition were Livie Broussard, Janie Chapin and Westin Cobb. In addition to the quiz bowl victory, LSU students gained additional honors in AAEA competitions.

Cobb placed first in the spreadsheet competition based on his undergraduate research project. Mimi Rivette placed first in the student paper competition. **Annabelle Lang**



The LSU AAEA champion quiz bowl team included, from left, Michael Younis, Mimi Rivette and Daniel Harris. Rivette also placed first in the undergraduate paper competition. Photo by Westin Cobb

LSU Dietetics Program Receives Perfect Internship Match Rate for Third Consecutive Year

Each year, thousands of applicants apply for dietetics internships across the country, but the match rate average is around 60%.

Erin McKinley, director of the Didactic Program in Dietetics for LSU, did not doubt that the LSU dietetic class of 2022 would receive a 100% match rate to internships, and for the third consecutive year the class did.

Twenty-one spring graduates and one alumnus of the LSU dietetics concentration successfully matched to dietetics internships as a pathway to becoming a registered dietitian.

"The class of 2022 was my first class from start to finish," McKinley said. "I've been watching them grow as not only students of dietetics but as young, well-rounded professionals and leaders."

The advanced training and development students undergo in the dietetics concentration makes them competitive applicants and highly sought out by internship programs. **Annabelle Lang**



Spring graduates of the School of Nutrition and Food Sciences pose with faculty members. Program director Erin McKinley stands on the center of the bottom row. The LSU College of Agriculture School of Nutrition and Food Sciences houses the nutrition and food sciences major and dietetics concentration. Photo by Annabelle Lang

Agricultural and Extension Education Student Receives the K.C. Toups Memorial Les Voyageurs Award

Zachary Mayfield, an agricultural and extension education with a concentration in leadership, received the 2022 K.C. Toups Memorial Les Voyageurs Award.

Mayfield said being surrounded by a support team with the shared goal of advancing agriculture through research, education and service makes him proud to be in the College of Agriculture.

In addition to being a member of Les Voyageurs, Mayfield is heavily involved in other LSU campus student organizations and activities. He is the president of the national honor society Omicron Delta Kappa, a student worker for the dean's office and served as vice president of the Agriculture Student Association. **Annabelle Lang**



Zachary Mayfield received the 2022 K.C. Toups Memorial Les Voyageurs Award. Photo by Annabelle Lang

New Faculty PROFILE

Carol Friedland Brings a Fresh Perspective to LAHOUSE

V. Todd Miller

While Wyoming and Louisiana are separated by more than 1,000 miles and don't share much in terms of climate or severe weather occurrences, Carol Friedland, a Wyoming native, learned lessons from an early age that shape her current life's work in the Bayou State.

As a child, Friedland's parents were frugal and lived off what the land provided. This idea of stretching a dollar combined with sustainability helped pave the way for Friedland's appointment in April as director of the LSU AgCenter LaHouse Home and Landscape Resource Center, replacing retired director Claudette Reichel.

"My parents were hunters, so they would get elk, deer and antelope every year," she said. "We rarely ate beef because it was more expensive, and we grew a lot of our own vegetables and canned or froze them."

The idea behind LaHouse is to use research to help provide homeowners with solutions for more comfort, durability, value, convenience, environmental quality, safety and better health in their homes while also using less energy and water and minimizing pollution, waste, damage and loss.

LaHouse offers research-based solutions for resilient, sustainable and healthy homes and communities.

Friedland said sometimes her family would drive two and a half hours to the nearest large city because supermarkets there would have double coupons.

"My early life informs how I approach my research," she said. "We watched our budget and tried to get the best quality for the best price."

While pursuing her master's degree and doctorate in civil engineering from LSU, Friedland began modeling the impacts of hurricanes and asking questions that directly related to homeowners' concerns — like if the damage was caused by wind or flood, and if insurance will pay for repairs or rebuilding.

"I wanted to better understand the types of damage that were occurring and how we could move forward with our prediction models to anticipate and understand these types of damage," she said.

This brought Friedland to her current project, which is funded by Louisiana Sea Grant, and is meant to help homeowners understand the incentives and barriers to freeboard for new homes. Freeboard is elevating a house above the regulatory standard or the base flood elevation. Additional information can be found at floodsafehome.lsu.edu, a web-based

tool that is being developed for homeowners in Jefferson, St. Tammany and Terrebonne parishes.

Friedland says it is often difficult to convince people to spend more on a home during the building process to avoid costs later, but the benefits are worth it.

"While the initial cost to build a home at a higher elevation is greater, most people don't pay for their homes outright, so with a mortgage it's only about \$30 to \$50 more a month," she said. "When you pay your mortgage payment each month, your principal and interest are higher, but what's taken out in escrow for your flood insurance is lower. So, in fact, you have more money at the end of the month."

Friedland is working to improve and update online resources. Her ongoing project in collaboration with LSU and the University of New Orleans is to expand the Flood Safe Home site beyond the three parishes it currently serves to 20 coastal parishes and, in the future, to the entire state.

"Flood hazards do not only impact coastal parishes," Friedland said. "Soon, all of Louisiana will be able to put in their address, their home's details and receive personalized results and recommendations to prevent flood damage and ultimately save money."

Friedland emphasized that she hopes to shift the focus of LaHouse from being a destination where people travel to learn about saving and sustainability to more of a research-based example of how to do things for people back home. She sees online resources as being the key to that evolution.

"Research and outreach are the missions of LaHouse," she said. "We hope to collaborate with other researchers to develop tools and solutions to help all families have a resilient, sustainable and healthy home."

V. Todd Miller is an assistant communications specialist in AgCenter Communications.



Carol Friedland has been named the new director for LaHouse, which offers research-based solutions for resilient, sustainable and healthy homes and communities. Photo courtesy of LSU University Relations

NATCHITOCHES 4-H FORESTRY TEAMS SUCCEED

at State and National Contests

Randall Mallette

With an economic value of more than \$900 million, the Louisiana forestry industry is the state's highest valued agricultural commodity. Because of its role in the economy, it is important for youth to appreciate and understand the industry. The forestry contest at 4-H University is a great way to cultivate interest.

Natchitoches Parish 4-H has been well represented over the years at the state and national forestry contests. Since 2015, 11 youth from the parish have competed in the state contest, and all of them advanced to the National 4-H Forestry Invitational.

In April of 2021, Natchitoches Parish 4-H members Chance Fontenot, Josie Fontenot, Teegan McKnight and Gunner Nash began training for the state forestry contest at 4-H University. They had to be able to identify 50 native trees, 15 insects and 14 diseases. Additionally, they learned to measure diameter at breast height and merchantable height of 10 trees, take accurate compass readings, and estimate distance between two points by pacing. Lastly, they took a general knowledge test.

The team won first place at the state contest held in June 2021 at Camp Grant Walker in Pollock, Louisiana. Individual awards included the top four highest individual scores in the state with Teegan McKnight ranking at the top followed in order by Josie Fontenot, Gunner Nash and Chance Fontenot. The win qualified them for the National 4-H Forestry Invitational held in July 2021.

To prepare for the national contest, the team had one month to learn additional trees, insects and diseases from



The 2021 Natchitoches 4-H Forestry Team won first place at the state contest held at Camp Grant Walker in June 2021. Shown from left, coach Randall Mallette, Teegan McKnight, Josie Fontenot, Gunner Nash and Chance Fontenot. Photo by Coree McKnight

other areas of the country, as well as topographical maps, site evaluation and forestry information. The team placed third in the country with two top 10 individual scores: Josie Fontenot in eighth place and Teegan McKnight in ninth place.

The competitions also let McKnight and Nash carry on family traditions. They are both second-generation state winners and national competitors.

This past June, a new Natchitoches Parish team took first place in the state at 4-H University. The 2022 team and their individual rankings included Caden Conley, first place; Roman Armstrong, fourth place; Brynn Landry, fifth place; and Sawyer Anderson, seventh place.

The team competed at the national contest held July 24-28 in West Virginia. There they not only placed second in the Forestry Quiz Bowl event but were also the second overall team in the nation. Additionally, Brynn Landry was the top individual in the Forest Health event. Individually they placed as follows: Caden Conley, third; Brynn Landry, fourth; and Sawyer Anderson, tenth.

The competitions foster learning about the industry and can provide a spark for youth to pursue a career in forestry. It is important for youth to continue to learn and develop an appreciation of the importance of this commodity, and the contests offer an excellent opportunity for youth to compete and travel the state and nation.

Randall Mallette is an LSU AgCenter extension agent for Natchitoches and Red River parishes.



The second-place team at the 2022 National 4-H Forestry Invitational includes Natchitoches 4-H members, from left, Caden Conley, Sawyer Anderson, Roman Armstrong and Brynn Landry. Photo by Veronica Conley

'CAMP THE WAY IT SHOULD BE':

4-H campgrounds welcome youth
back in time for

100th anniversary

Whether in Big Creek or in a modern pool, swimming has been a preferred pastime at camp for a century.

LSU AgCenter file photo

Olivia McClure

Charles Hebert is among thousands of people who have memories of spending a week at Camp Grant Walker during childhood summers.

Making the trek to the Pollock campgrounds for a few days of doing outdoor activities, making new friends and sleeping in cabins has long been a highlight of the Louisiana 4-H experience. Hebert had such a good time that he went on to become a camp counselor and volunteer — and ultimately, a 4-H agent with the LSU AgCenter.

He still gets excited when camping season rolls around.

"This is the best and most fun time

of the year," said Hebert, who has been with the AgCenter for 28 years and is based in Lafayette Parish. "We get to recruit kids to come to camp. Many of them have never left their parishes, so this is a new experience."

Camp Grant Walker holds a special place in the hearts of generations of Louisiana 4-H'ers. This year, the facility — named for the parish where it is located and for local businessman Rufus Walker, who donated the land — is celebrating its 100th anniversary. And this summer's camping season, which wrapped up at the end of July, marked the first time since 2019 that 4-H'ers

from across the state have converged on the campgrounds.

"We're just glad to be back in person," said camp director Christine Bergeron. "The last two years, we've had a lot of struggles — not only being closed for COVID, but also the damage we suffered from hurricanes Laura and Delta and from the ice storm."

4-H staff put on a virtual camp in 2020 and organized a traveling day camp program last year. This year, participants were back to doing quintessential summer camp activities — swimming, canoeing, riding four-wheelers and fishing as well as arts and crafts,

games, dances and educational endeavors — beneath towering pine trees.

“Everything we do is outdoors, and it’s important for the kids,” Bergeron said. “It’s important for us to be back where we’re supposed to be and have camp the way it should be.”

The campers are in fourth to sixth grades. Camp sessions are held each week throughout the summer, with a few parishes participating in each session.

“Camp is really fun, and unlike school, they give out learning in more of a fun way than a boring way,” said Mana Salehi, a camper from Lafayette Parish who was attending with her twin sister, Nikki. “And I really like all of the activities we get to do.”

Her favorites were swimming and canoeing.

Does she want to come back next year? “Yes, definitely.”

Winston Lambert, a 9-year-old camper, was fascinated by a science exercise in which campers put different materials in a water bottle to model pollution and filtration in wetlands environments. “It was pretty cool,” he said.

Most of all, Winston said, he was enjoying the freedom that came with being away from home.

Camp helps young people develop independence and other important life skills, Hebert said. For example, campers are responsible for working together to keep their cabins clean. And because they come from communities across Louisiana, campers learn to respect differences.

“You have kids from the south and kids from the north that learn that kids speak differently. Language is a little different — our dialects,” Hebert said. “But ultimately, our kids come together as a great team.”

The experience also opens participants’ eyes to the many opportunities available to them in 4-H, said Colton Dupre, who came to Camp Grant Walker as

a youngster in 4-H and is now a staff member there.

“I think this is a good place to build those connections with other people and start to see 4-H is bigger than just your small clubs,” he said. As 4-H’ers get older, they can participate in state and national competitions, return to camp as counselors and more.

Camp Grant Walker opened in 1922. Back then, the cost to attend summer camp was one live chicken.

Many things have changed in the past century.

When Wanda Zeringue camped as a 4-H’er in the 1960s, “it was a little different” than the modern-day experience. She recalled staying in cabins that didn’t have air conditioning and cooling off during the day by swimming in a creek.

Years later, Zeringue sent her children to camp, and more recently, her grandchildren have attended. She said she has been pleased to see new activities added and facility improvements made over the years.

These days, she comes to camp as a volunteer with Lafayette Parish 4-H. She was joined this summer by one of her granddaughters, who was at camp for the first time.

“I thoroughly enjoy it — watching the kids learn and interact,” Zeringue said. “They’re very quiet the first day, but by the last day, they don’t want to leave.”

She has fond memories of her time at Camp Grant Walker and is glad the tradition is continuing.

“4-H camp was a week away from home. You got to learn new things. You got to see people from all over the state,” she said. “And it was really a fun time, and it’s been the same for my daughter and for my granddaughters.”

Olivia McClure, an associate communications specialist, is a writer, photographer and videographer for the AgCenter.



Campers at Camp Grant Walker play games together in the 1940s. LSU AgCenter file photo



LSU AgCenter 4-H agents Chris Pearce, left, and André Brock, right, help 4-H’ers get accustomed to the controls of four-wheelers at Camp Grant Walker. Photo by Olivia McClure



Campers in the mid-1900s receive an education on wildlife with examples of birds preserved through taxidermy. LSU AgCenter file photo



■ 4-H’ers, including Lafayette Parish’s Nikki Salehi, right, paddle canoes around a pond at Camp Grant Walker.

Photo by Olivia McClure

4-H IS A FAMILY AFFAIR

Kimberly Deville

4-H is a youth development program that allows kids ages 9 to 19 to explore and learn about their own strengths and weaknesses while empowering them with the skills to lead for a lifetime. For all of these to be successful, youth and adults must be willing to work as a team to get it all done. One great example of this is happening in a small parish right in the middle of Louisiana.

Evangeline Parish has around a thousand 4-H members, and they have so much support that it spans generations. Bob and Katy Marcantel live in a rural area near Mamou, Louisiana, on a farm that has been teeming with sheep

and kids and now grandkids who are all involved in 4-H.

The Marcantels have been active in 4-H since the beginning. They met at Camp Grant Walker as kids themselves dancing under that old pavilion. It was there that the seed was planted that grew their relationship with 4-H and each other.

They entered parish cooking contests, showed sheep, competed in public speaking and attended Short Course, the forerunner to today's 4-H University, and later they showed their kids what 4-H was all about.

The Marcantels have eight children that are now grown, with 21 grandkids

and four great grandkids between them. Every one of them began showing sheep at the age of 9, attended workshops, competed in 4-H contests and have become junior leaders that went on to volunteer in their community. Each of them has a favorite story from 4-H that helped them to realize they were members for life.

Katy remembers being the leader at Vidrine School where she taught. She did it all. She helped her members with record books, chauffeured them around the parish to contests and activities, and worked at 4-H Achievement Day every year and still does today.

Her husband, Bob, served as one of

the original members of the Evangeline Parish 4-H Foundation, helping to form the governing body for Evangeline. He also served on district and state livestock advisories throughout his career and was inducted into the Southwest District Livestock Show Hall of Fame.

Their kids, Ben, Beth, Jacob, Robbie, Amy, Sarah, Caroline and Seth, continue to support 4-H. Amy Deshotel, one of the four girls in the family, remembers fondly going on the Louisville, Kentucky, reward trip for livestock.

Amy said she will never forget all the new breeds of sheep and cattle that they saw there along with the size of the facilities. She was truly amazed, and they even went back as a family several times after winning this state-sponsored livestock trip.

By eighth grade Amy's brother Ben had built his flock of sheep to 30 head and was not only a very competitive exhibitor, but he was also helping his siblings to get in on the action. Ben is now the owner of Marcantel Club Lambs. He sells lambs to 4-H members around the country and buys market animals from 4-H members across the state in support of their projects.

It was nothing for Jacob and Robbie to get out of school and leave with their

dad to drive to Wichita Falls, Texas, or to Oklahoma to pick up new sheep. Sarah said they even showed pigs for a while. These chores, washing and grooming animals, and even doing a demonstration on how to bake something made them who they are today.

Beth, Caroline and Seth, while not in agricultural careers, buy animals from the sale, donate to the Junior Leader Club and have even assisted with the Trash Bash clean up at Chicot State Park. 4-H taught them how to be responsible adults, and they are passing that down to not only their own kids, but to all of those they touch in the community when they help with 4-H.

The grandchildren have also gotten in on the action and are very active 4-H members or graduates of the program. All three of Amy's kids, Jose, Javier and Briseyda, are in the Junior Leader Club that does volunteer work around the parish. Jose is a licensed auctioneer at the age of 20 and volunteers in surrounding parishes as well as Evangeline to help with their 4-H animal sale, while he is working his way through college.

Sarah has four kids: Eli, Ana, Sebastian and Nadia, who compete in parish contests and attend camps and clinics all year long. Eli, while still in high

school, is building his own flock and plans to major in veterinary medicine. Caroline's three, William, Nick, and Isabella, not only showed sheep, but won buckles, banners, and went on the same trip to Louisville their parents went on before them.

Their cousin Ancil, Jacob's son, has already begun a program for veterinary medicine for high school members at Texas A&M University. The rest of the grandkids range in age from 2 to 15 and are being brought up right alongside their siblings in the world of 4-H.

Whether the kids attend a cooking workshop, electric workshop, fishing clinic or a citywide cleanup, they have a goal. Even though all their goals may be different, 4-H is helping them to build the skills they need to become well-rounded, hardworking, self-motivated leaders. It has also helped them to make many connections that have turned into business partners, lifelong friends and even family.

4-H welcomes young people of all beliefs and backgrounds, giving kids a voice to express who they are and how they make their lives and communities better. It "makes the best better!"

Kimberly Deville is an AgCenter 4-H and Youth Development agent in Evangeline Parish.



Multiple generations of the Marcantel family from Evangeline Parish have been involved in Louisiana 4-H. Photo by Marie Soileau



A new generation of Marcantel family 4-H'ers. From right to left, Isabella, Ana, Izzy, Sebastian and Nadia pose with the winning entry in the Evangeline Parish Livestock Show. Photo by Caroline Manual



Marcantel grandson Eli poses with his family after winning at the district livestock show. Photo by Sarah Thomas



Bob and Katy Marcantel's grandson Javier shoots at a 4-H State Shooting Sports match. Photo by Amy Deshotel



Tea plants and fields at the LSU AgCenter Hammond Research Station. LSU AgCenter plant specialist Yan Chen and her team have been studying how shading affects tea production in the state during summer months. Photo by Olivia McClure

RESEARCHING TEA IN LOUISIANA

Yan Chen, Zhijun Liu and Javen Little

The United States is the second largest importer of tea, with a market value at \$13.1 billion in 2021, according to the Tea Association of the U.S.A Inc. The tea plant, *Camellia sinensis*, can be grown in many areas of North America, especially the southeastern region of the U.S.

According to a recent online tea industry survey conducted by a group of university researchers, currently, there are about 60 tea growers in 15 states, of which 80% are family-owned small farms that are fewer than 5 acres, and 56% were established in the last 10 years.

Specialty tea, or loose-leaf tea, is the most profitable category for domestic tea production, compared with the super-market, ready-to-go and food service categories. Though the number of growers and total production have seen significant increases, U.S.-grown, loose-leaf tea only is a negligible fraction of the specialty tea market, accounting for \$3.1 billion in 2021.

For the next several years, the demand for tea in every category mentioned above is projected to continue their trend of increase, especially loose-leaf tea, according to a 2021 study by the Tea Association of the U.S.A Inc. It seems that now is the best time ever for prospective producers to consider adding the tea plant to their production. However, there are still many challenges, concerns and barriers for the domestic tea industry to further develop and build its production base. Extreme climate events and a lack of regionally specific recommendations on variety, soil fertility and nutrient

management practices are among the top prioritized industry needs.

Full-sun radiation and heat during the Gulf Coast summer months may adversely impact the quality of tea leaves. Shade treatments may effectively improve tea quality through suppression of flavonoid and lignin compounds that are associated with bitterness in tea leaves grown in full sun. In 2021, AgCenter researchers conducted a temporary shading study to evaluate how 40 days of shading during the unfavorable summer growing season would affect the content of desirable chemicals, such as caffeine and the antioxidant epigallocatechin-3-gallate (EGCG), in harvested and processed tea products.

A full-sun tea field at the LSU AgCenter Hammond Research Station with the variety Georgian Tea was used in this study. Treatments were applied from mid-June to end of July and included 0%, 40% and 80% black shade cloths. There were four 10-foot-by-30-foot plots used for each treatment, with seven to 10 tea plants in each plot. Actual levels of shade were measured by a photosynthetically active radiation (PAR) sensor.

Actual PAR intensity under 40% shade cloths ranged from 29% to 55% of the PAR level under full sun, so the 40% shade cloth reduced about 45% to 71% of the light in the PAR range. Actual PAR intensity under 80% shade cloths ranged from 20% to 36% of what was measured under full sun; therefore, this shade cloth provided a reduction of 64% to 80%

of the light in the PAR range. Air and soil temperature under the shade treatments were monitored and were lower in the shaded treatments.

Tender tips, including one leaf bud and one unfolding leaf, were harvested at 15 days before the shade treatments began. These samples were named "pre-treatment" samples. Tea plants were then trimmed the day before shade treatments began. Tender tips from new shoots grown during the 40-day shade treatments were harvested three days before the removal of the shade cloth and these samples were named "during treatment." All tea plants were grown under full sun once the shade cloths were removed. Plants were trimmed again and harvested at 35 days after they were back to full sun. These samples were named "post-treatment."

At each harvest, fresh tender shoots were processed into white tea and green tea following the methodologies growers are using. A total of 36 samples each of white tea and green tea were stored in a refrigerator for a month before being analyzed for caffeine and epigallocatechin-3-gallate (EGCG) levels with high-performance liquid chromatography (HPLC).

Results indicated that concentrations of the antioxidant EGCG in green tea samples were reduced by the shade treatments but returned to pre-treatment levels at 35 days after the removal of shade cloths. This shade effect on EGCG was unexpected because biosynthesis of catechins is mediated by photosynthesis, and reduced photosynthesis under full sun was expected. Thus, there is a lower EGCG concentration



LSU School of Plant, Environmental and Soil Sciences undergraduate student Javen Little prepares for a temporary shading tea study. LSU AgCenter researcher Yan Chen's team conducted a temporary shading study to evaluate how 40 days of temporary shading during the unfavorable summer growing season would affect the content of desirable health benefitting chemicals, such as caffeine and the antioxidant EGCG, in harvested and processed tea products. Photo by Olivia McClure

under full sun and an improved (higher) concentration when some shade is provided. EGCG is one of the chemical compounds that will give green tea its unique gentle flavor and is highly desired for both flavor and health benefits.

During the shading treatments, white tea samples from shaded plants had lower caffeine concentrations regardless of shade levels. And in general, caffeine concentrations in white tea samples were higher in those harvested before shading treatments began than those harvested 35 days after shade cloth removal. These results were expected and similar to previous findings in other studies. Caffeine concentrations in tea are in general much lower than coffee (20% to 25%) after brewing; however knowing how manipulating light may affect its levels is important for labeling and marketing.

From this preliminary study, temporary shading affected EGCG and caffeine concentrations differently, and further study is needed to elucidate the comprehensive impact of light levels including PAR and other light ranges on these key compounds. We are working on the analyses on the flavor and aroma of these samples and plan to repeat this study to have more conclusive results on how shading can be used to manipulate tea leaf quality.

Yan Chen is a professor at the LSU AgCenter School of Plant, Environmental and Soil Sciences. Zhijun Liu is a professor at LSU AgCenter School of Renewable Resources, and Javen Little is an undergraduate student in the LSU School of Plant, Environmental and Soil Sciences.

CAN TEA PRODUCTION BE 'SWEET' for Southern Growers?

V. Todd Miller

In the 1989 classic film "Steel Magnolias," hairstylist Truvy Jones, played by Dolly Parton, refers to iced tea as the "house wine of the South." But is tea also on the cusp of becoming a lucrative Southern crop? LSU AgCenter researchers and one local grower see potential in the emerging market.

LSU AgCenter plant specialist Yan Chen and her team conducted two tea research studies at the Hammond Research Station over the past year, both funded by the LSU College of Agriculture Discover undergraduate research program. She calls the results "preliminary but interesting," and says the students involved have presented them at two horticulture academia conferences.

Chen cites labor as one of the top challenges for commercial tea production in the U.S. because hand harvest is a labor-intensive endeavor, yet it is essential for making high quality specialty tea.

According to Chen, a new selective harvester, released by Williames Tea last year, has assisted growers in making quality specialty tea at a much lower labor cost.

"As indicated by trials conducted at a Mississippi tea farm, the quality of tea leaves harvested using this harvester was very close to hand plucking," Chen said. "Operated by two people, it takes only 10 minutes to harvest a field that would have taken a day if harvested by hand."

"We have ordered the selected harvester and expect it to be delivered later this year," she said. "We are likely to schedule a spring tea workshop once the machine is delivered."

Chen went on to say that her team has grown a significant number of tea plants that are available for interested growers for trial.

"We need to have a larger production base to leverage USDA support," she said.

AgCenter economist Michael Deliberto agreed that harvesting tea can be labor intensive and the overall process takes time.

"The harvest process involves withering, rolling and drying," he said. "However, tea plants cannot be harvested until they are 4 to 5 years old."

Deliberto said that his research showed a single acre can produce about a ton of tea.

Hans Marchese, tea production manager at the Fleur de Lis Tea Co. in Amite, says that the past year has been an eventful one for the producer and distributor.

"This is our first year commercially producing tea," he said. "Our first black tea, Big Easy, was designed by Beverly Wainwright of the Scottish Tea Factory who has made half a dozen award-winning teas from plants grown in Sri Lanka, Myanmar and Scotland."

Marchese said that in 2023 the farm will be developing a green tea as well as a white tea. In addition, there are plans in the works for an immersive tea-making course.

"We will teach people how to make tea," he said. "They will have the chance to see the whole process from plucking, to withering, to rolling, to oxidizing and into the dryer."

V. Todd Miller is an assistant communications specialist in AgCenter Communications.

■ LSU AgCenter horticulturist Yan Chen pours samples of black tea for attendees of the July 22 field day at the Hammond Research Station. Chen studies growing tea plants, which are a type of camellia.

Photo by Olivia McClure



FARM TO SCHOOL PROGRAMS IN PUBLIC SCHOOL DISTRICTS: A Growing Interest With Challenges

Whitney R. McKinzie and Maria Bampasidou

Farm to school programs are initiatives that connect communities and schools with local food producers through food procurement and active learning opportunities, bringing awareness to the importance of agricultural activities. Core components of farm to school programs include procurement, or local purchases of agricultural products; education in the form of farm trips, food tastings and other activities; and school gardens. Farm to school programs increase student access to healthy food, integrate nutrition and agricultural education, and offer enriched learning opportunities that can lead to changes in lifestyle. Moreover, the programs bring awareness of production activities at the local level and create economic opportunities for farmers.

Louisiana is one of the states that promotes farm to school programs through legislative activity. Currently, the farm to school program is a partnership between the Louisiana Department of Education and the LSU AgCenter. The U.S. Department of Agriculture Census records farm to school program participation, interests, activity implementation, related challenges and future directions of the program. The latest farm to school census conducted in 2019 was answered by 153 school food authorities, which include public school districts and private and charter schools that represent about 747,000 students. Results reported a total of 981 schools participating in farm to school activities, with 69.4% of schools serving local food and 53% of participating schools providing food, nutrition and agricultural education. This report presents results from public school districts based on the census.

The farm to school program has gained popularity in Louisiana in recent years as more schools are integrating farm to school activities into their es-

tablished curricula. During the 2011-12 school year, 59 Louisiana schools conducted farm to school activities on their campuses. This number increased to 152 Louisiana schools during the 2013-14 school year and increased again to 606 Louisiana schools documenting the implementation of farm to school activities during the 2018-19 school year. Many farm to school programs are in the southern region of the state, with fewer programs located in northern Louisiana.

School officials reported on barriers for offering farm to school activities, with program implementation challenges being one of the most indicated barriers to program participation. Implementation challenges include lack of year-round availability of locally sourced products, high prices of locally sourced products and unavailability of locally sourced items from primary vendors.

The key challenges to programs were placed into categories for an analysis. Category 1 represents availability-related challenges, category 2 denotes producer- and vendor-related challenges, category 3 represents sourcing-related challenges and category 4 denotes kitchen-related challenges. In this analysis, we examined which challenges influence a public-school district's decision to participate in farm to school programs. To view figures and charts from the analysis, visit <https://bit.ly/F2Sstudy>. We looked at two main components. Component 1 combines category 1, 2 and 3, as these are main challenges reported in the literature, and component 2 is the kitchen-related challenges. Our analysis shows that these two components decrease the likelihood of a school district participating in farm to school by about 43%. As shown, the main barriers relate to local food procurement, and to that we can add seasonality of food production and location of the school district as

challenges that can influence participation.

Agricultural production is seasonal, so availability year-round is one of the main reported challenges that may impede local procurement. Looking more closely at agricultural production and local procurement, there is a misconception that school districts located in areas with high agricultural production may request a specific crop. However, this is not always the case. For example, rice is one of the top crops in Louisiana and is grown primarily in the southwestern, central and northeastern regions of the state. Some school districts, such as those in Lafayette and Avoyelles parishes, requested local rice for their farm to school programs and are in regions of the state with significant rice production. However, St. Helena Parish and St. Bernard Parish requested rice as a part of their local procurement activities and are not located in areas with prominent rice production. This raises the question of how we define local and how producers, school officials and nutrition directors, and students perceive local foods.

Understanding what affects Louisiana school district farm to school program participation and implementation has various implications for members of the community. This information can aid policymakers in creating legislation that will help to ensure the success and longevity of farm to school programs in Louisiana. This research also provides valuable information to farmers in the community about the challenges that schools face and what may deter them when it comes to participating in farm to school programs.

Whitney R. McKinzie is a graduate student and Maria Bampasidou is an associate professor, both in the Department of Agricultural Economics and Agribusiness.

NONDESTRUCTIVE ANALYSIS ON AGRICULTURAL PRODUCTS Using Near-Infrared Spectroscopy

Kun-Jun Han, Buddy Pitman and Wink Alison

Conventional sample analysis is accomplished through laboratory-based chemical analysis procedures that quantify target constituents. However, these procedures involve hazardous chemicals, labor and long processing times. A non-destructive analysis using near infrared spectroscopy (NIRS) realizes rapid and chemical-free assessment on a broad spectrum of samples. The NIRS calibration procedure and analytic application has great potential for agricultural researchers and stakeholders.

Near-infrared light was first found in the 1800s, but it was not until the development of its application in agricultural quality assessment in 1954 that NIRS technology became widely used in industry and academia. Light with wavelengths between 780 and 2,500 nanometers can penetrate an object further than mid-infrared light, which causes various types of vibrations from molecular bonds. These vibrations can be processed by computer software into spectral data unique to each product sample. The recent development of new mathematical algorithms further assisted prediction model development for target chemical constituents. Additionally, with an improved computer interface and optical technology, NIRS instruments are more sophisticated with enhanced analytical accuracy and precision.

PROCEDURE FOR NIRS CALIBRATION DEVELOPMENT

Determining the quality of agricultural commodities using NIRS is advantageous compared to conventional chemical analysis because it reduces cumbersome and time-consuming chemical analysis procedures. However, NIRS analysis still requires chemical analysis at the initial calibration stage in order to efficiently conduct routine sample analysis. The calibration procedure provides reference samples with known constituent values to the NIRS device to train it.

The calibration procedure begins with collecting at least 150 representative samples covering a product population of interest. The collected samples are then scanned with NIRS to collect the spectral data of samples.

The collected spectral data is processed using a mathematical algorithm to categorize samples into the subgroups of reference, validation, redundancy and outlier. The redundant samples are eliminated from the calibration model development because of their similarity to the reference samples. This step of identifying redundant samples is another significant advantage of using NIRS to avoid unnecessary chemical analysis. The samples in the outlier group are also eliminated from the calibration model development, but

those samples are valuable for later expansion of the calibration model. The reference samples are subject to conventional chemical analysis at a lab and are to be used for calibration model development. The spectral data of reference samples are regressed against the chemical analysis results as the last step in developing a calibration model. Finally, the validation samples are saved to check the calibration models' robustness and potential overfitting.

Any NIRS device installed with a calibration model can then conduct routine analysis of samples at a rate of one sample in less than a minute. While third-party-developed calibration models are available for common nutrient constituents of major agricultural commodities on a subscription or license basis, they often do not include the more specific constituents or characteristics required by research and plant breeding programs. Therefore, calibration models must be developed by researchers. Developing a custom calibration model requires substantial effort at the calibration model development stage; however, it can provide more control to researchers for target constituent settings and flexibility for future refinement of developed calibration models.

CURRENT AND FUTURE EXTENDED APPLICATIONS AT THE LSU AGCENTER

At the LSU AgCenter, NIRS has been used for the assessment of nutrient value, digestibility, and potential intake of forage and feed samples. This function has enabled the LSU AgCenter Forage Analysis Lab to serve Louisiana forage and livestock producers by recommending ways to optimize forage feeding and fertilization to boost hay sales and livestock management.

At the LSU AgCenter School of Plant, Environmental and Soil Sciences, expansions of NIRS to row crop and specialty crop analysis are planned through collaborative efforts with researchers so that tailored calibration models can be custom-made for less common analytes, which are the substances that are being analyzed. The NIRS analysis has great potential value to developers of food and feed products, particularly where new products or processes may require product quality or safety verification.

Kun-Jun Han is an associate professor in the LSU AgCenter School of Plant, Environmental and Soil Sciences in Baton Rouge; William "Buddy" Pitman is a professor at Hill Farm Research Station in Homer; and Montgomery "Wink" Alison is an associate professor at the Macon Ridge Research Station in Winnsboro.

FRESH IDEAS FOR FRESH PRODUCE

in the Local Food System

Cecilia Stevens and Ruthie Losavio

Food access and food insecurity are old problems getting new solutions in Morehouse Parish thanks to a partnership between the LSU AgCenter and the Robinson/Williams Restoration of Hope Community Center (RWROHCC). The community center is in a low-income neighborhood with limited food access. There are negative health consequences associated with low access to fresh produce. Morehouse Parish ranks 62nd out of 64 parishes in overall health outcomes — 43% of the parish's residents are obese, 14% have diabetes, 28% are food insecure and 15% have limited access to healthy food. The partnership is a model for food system policy, systems and environmental changes in other rural parishes.

The LSU AgCenter Healthy Communities program administers a Centers for Disease Control and Prevention High Obesity Program grant in six parishes, including Morehouse. The grant supports food system initiatives at RWROHCC that aim to improve health outcomes in the parish.

The partnership began in November 2020 when the AgCenter helped the center apply to become a food pantry through the regional food bank. The food pantry has grown to serve more than 90 families per month. In spring 2021, RWROHCC received an LSU AgCenter Healthy Communities/ Farm Fresh Meals for Louisiana miniature grant, which provided training on cooking with local produce and supplied cooling equipment to increase the site's food storage capacity. An average of 15 students per week taste test vegetables and enjoy healthy after-school snacks due to this intervention. A community garden was also built that spring and provides donations to food pantry clients.

With the new knowledge, status, garden and equipment, the center enrolled in the AgCenter's Grow a Row to Share program this spring as both a garden and food distribution site. The program provided training on safely harvesting and distributing produce. Now, the community center has the

tools and infrastructure needed to function as a mini food system within the community. From May to July 2022, the center distributed 295 servings of fresh produce and had a produce booth at the July farmers market.

The possibilities do not end there. The combination of community center, food pantry and garden provide unique opportunities for local youth. Denise Guyewski, 4-H associate extension agent for Morehouse Parish, designed and built the garden with assistance from the center's director Randy Williams and Morehouse Healthy Communities Coalition members. Local 4-H members help maintain the garden and are critical to its sustainability.

"The community garden offers 4-H members the opportunity to participate in activities that positively impact their community. The members put their knowledge to use by planting, maintaining, harvesting and donating produce to the RWROHCC food pantry. They get to see firsthand how their hard work pays off for the community," said Guyewski. Youth participating in summer and after-school programs at the center are looking forward to cooking with ingredients grown in the garden.

With these successes in place, the group turned to another piece of the food access puzzle: economic development. The newly formed Morehouse Food Systems Workgroup identified an opportunity to launch a monthly farmers market at RWROHCC. In July, the center began hosting the Second Saturday Farmers Market as an outlet for community

members to sell fresh produce, canned goods, crafts and other homemade products such as baked goods. The center is also applying to accept Supplemental Nutrition Assistance Program (SNAP) benefits to make it easier for families with limited income to shop. Extra produce from the community garden will also be sold at the market and reinvested into the program. This will have an immediate impact on the 90 SNAP-eligible families who receive food pantry boxes on the day of the farmers market and are built-in customers for that day's market.

"The garden will support the farmers market, which will allow people in the community to purchase fresh vegetables that are grown locally," said Williams. "Hopefully, this will encourage our clients to adopt a garden box and sell produce here at the market, which will offer another source of income to our community."

The collaborative nature of the center's community garden and food pantry can be a model for others seeking local solutions to food access issues.

"We're showing our community and other communities like ours that policy, systems and environmental changes can help communities gain access to fresh produce," said Jocinda Jackson-Jones, Morehouse Parish Healthy Communities agent.

Cecilia Stevens is the northeast local food systems coordinator for LSU AgCenter Healthy Communities based at the Scott Research and Extension Center. Ruthie Losavio is the communications coordinator for LSU AgCenter Healthy Communities in Baton Rouge.



Radishes, peppers and lettuce were part of the first harvest from the Robinson/Williams Restoration of Hope Community Center in May 2022. Photo by Cecilia Stevens

Jocinda Jackson-Jones, Morehouse Parish Healthy Communities agent, picks lettuce from the garden at the Robinson/Williams Restoration of Hope Community Center. Photo by Cecilia Stevens



Lettuce grows in the garden at the Robinson/Williams Restoration of Hope Community Center. Photo by Cecilia Stevens



The Robinson/Williams Restoration of Hope Community Center's garden was installed in the fall of 2021. Photo by Cecilia Stevens

GROWING FARMERS, GROWING COMMUNITIES:

LSU AgCenter Extension Programs Support Local Food Systems

Maria Bampasidou, Carl Motsenbocker, Marcus Coleman, Kathryn Fontenot and Sydney Melhado

Local food systems, which are primarily defined by food that is locally produced, marketed and consumed, are not a new concept in the broader U.S. food system. Because of its growing popularity among consumers, local food is a growing share of the U.S. food system; however, its overall market share is small, as it constitutes less than 4% of total U.S. farm sales. Local food, as defined by the U.S. Department of Agriculture (USDA), is food that has traveled fewer than 400 miles from its origin or within the state in which it is produced. Popular markets for local food include restaurants; grocery stores; institutions such as schools and hospitals; wholesalers; food hubs; and direct sales to consumers, which include farmers markets, on-farm stores, farm stands and community supported agriculture programs.

Resilient and sustainable local food systems can play an instrumental role in fostering community economic and social development by improving the well-being of producers, consumers and those in between. Benefits of a community-based approach to local foods include increased economic activity through local procurement, better health and nutrition outcomes for consumers, and awareness of agricultural production and enriched social capital — the ability of people to work together with a common purpose. Farm to school programs and farmers markets are prime examples of synergies between communities, producers and government programs to ensure access to healthy food.

The National Farm to School Network, based on 2019 data, reports increased consumption of fruits and vegetables from 0.99 to 1.3 servings per day. The network also found an increased willingness to try new and healthy food and a minimized risk of childhood obesity. In addition, farm to school programs have been found to reduce health and educational inequities especially among low-income communities.

In Louisiana, a growing interest in local foods has been observed over several years with producers seeking more information and training related to food production, accessing local markets, and managing the various risks associated with producing and marketing food locally and sustainably. LSU AgCenter researchers and extension faculty have collaborated with community-based nonprofit organizations in southeastern Louisiana to provide training programs for new and beginning horticulture farmers. In this context, new and beginning farmers refers to individuals with fewer than 10 years of farming experience. These training initiatives, Grow Louisiana and Growing Farmers, have increased the ability

of the LSU AgCenter to connect with and train new and beginning farmers. These programs are designed to support small-to-medium-scale farm enterprises through technical production and basic farm business education and farmer-to-farmer networking. These programs are designed to provide farm business entrepreneurs training and resources to assist in increasing farm business revenue.

Grow Louisiana, which started in 2019, was funded through the USDA National Institute of Food and Agriculture Beginning Farmer and Rancher Development Program. The program offered educational and hands-on training to fruit and vegetable farmers with an interest in sustainable production practices. The program was designed as an academic-community collaboration with three community-based organizations: SPROUT NOLA and Market Umbrella, which are based in New Orleans, and the Acadiana Food Alliance in Lafayette. Such collaborations have been instrumental to the success of the program, said Chris Adams of the Acadiana Food Alliance, a key partner in Grow Louisiana. “Our local farmers of vegetables, fruits, livestock and other small-scale food producers are a relatively small and underserved community,” he said. Adams added that “bringing community and extension together offers benefits to all local food system players and ultimately results in a stronger local food system.”

From 2019 to 2021, Grow Louisiana trained three cohorts of new and beginning farmers with cohorts based in New Orleans in 2019, Lafayette in 2020 and Baton Rouge in 2021. In its year-long curriculum, participants were able to attend a regional sustainable agriculture conference and participate in 16 classroom-based training classes that took place in the spring and fall. Participants also took part in practical farm experiences, such as hands-on activities and field days at local farms, which were designed to reinforce the classroom-based sessions. The program also included various farmer-to-farmer networking opportunities organized through the Collaborative Regional Alliance for Farmer Training (CRAFT), which was led by program partners and mentor farmers. Evaluations of program participants over the three years indicated that the program was successful in increasing the participants’ overall farm business knowledge and their knowledge of horticulture, which includes the study of fruits, vegetables and soil.

Growing Farmers, funded by the Southern Risk Management Education Center, emphasizes financial and marketing risk management. The program offers webinars and in-person workshops throughout the year and concludes its activities in

summer 2022. The program is a collaboration with First South Farm Credit, the Natural Resources Conservation Service, the Louisiana Department of Agriculture and Forestry, LSU AgCenter Annie’s Project, Compostella Farm and Fullness Farm. Trainings include grant writing, financial record keeping, taxes, online platforms, and direct marketing and were complemented with presentations from LSU AgCenter faculty on food safety, financial literacy, and MarketReady, which is a better business training series. So far close to 200 people have attended the webinars and workshops.

Maria Bampasidou is an associate professor in the Department of Agricultural Economics and Agribusiness. Carl Motsenbocker is a professor in the School of Plant, Environmental and Soil Sciences and is the team leader for Grow Louisiana Beginning Farmer Training Program. Marcus Coleman is a visiting assistant professor in the School of Liberal Arts at Tulane University. He previously served as program director for the AgCenter Grow Louisiana Beginning Farmer Training Program. Kathryn Fontenot is an associate professor and extension specialist, and Sydney Melhado is an extension associate in the Department of Agricultural Economics and Agribusiness.



The Grow Louisiana training cohort attends a field day hosted by Grow Dat Youth Farm in New Orleans. Photo provided by Marcus Coleman



Grass-fed pork is the top product at T. Moise Farms in Sunset, Louisiana. Monica Hernandez, who helps run the farm with her husband, attended the Grow Louisiana program. Photo by Kyle Peveto

Tara Sanchez and Eddie Cortez produce honey, garlic and other items while waiting for their olive trees to reach maturity. They plan to market a locally produced olive oil.

Photo by Kyle Peveto

FIGHTING HURRICANES AND PESTS, New Farmers Find Help in AgCenter Program

Kyle Peveto

Three years ago, Tara Sanchez and Eddie Cortez bought an abandoned trailer park outside New Orleans.

The weed-choked shells of old mobile homes remained on the overgrown acreage, a 100-foot-wide parcel that stretched more than a mile to a bayou.

When they saw the overgrown property in northern Plaquemines Parish, they envisioned a farm with beehives, berry bushes, olive trees and a greenhouse full of cucumbers.

"We're trying to be balanced out here," Sanchez said. "We can't just do one thing because we work with the land, not against the land."

After buying the land, they removed the old trailers and built an office and additional structures. They also fought pests and rebuilt after the floods and winds of tropical storms and hurricanes. Now named Z Farm and Orchard, the farm produces several crops, but there were times when Sanchez was unsure their gamble would pay off.

She gained confidence after joining the first cohort of the Grow Louisiana program from the LSU AgCenter in 2019. Based in nearby New Orleans, the program's seminars, classes, farm tours and mentoring sessions helped convince her that their dreams could succeed.

Cortez and Sanchez have varied backgrounds. She earned a doctorate in sociolinguistics from the University of Pennsylvania and has taught at five universities. She now teaches Spanish and Japanese at Chalmette High School. Cortez, her partner in business and life,

had been a carpenter and woodworker, but he was confident he could learn to farm.

Grow Louisiana contributed to Sanchez's understanding of the business of agriculture, she said. She met like-minded growers from south Louisiana who had made the small-farm model work, so she knew it was possible.

"I've done a lot of different things in my life," Sanchez said. "I've had a lot of jobs, but a business understanding was not a part of them, so that aspect really helped. I think people who like to grow things like to go into farming, but not all the people who like to grow things know how to actually do that as a business."

At the end of the program, Sanchez developed a business plan and presented it to her class. Their main goal for the farm was to produce olive oil from trees they planted on their property. Knowing the trees needed years to mature, they chose to sell honey at farmers markets, cut firewood from the trees they had to cut from the overgrown property and grow cucumbers to make pickles. This past year they also raised garlic. By braiding the garlic stems in an aesthetically pleasing manner, they added value to the crop.

While they have not followed it exactly, the business plan provided a road map for their young farm.

"That really helped me pull all the pieces together," she said. "I knew this is how it's going to work."

Kyle Peveto is an assistant communications specialist for AgCenter Communications and editor of Louisiana Agriculture.

■ At T. Moise Farms, Tim Melancon and Monica Hernandez raise lambs and other animals. They process the meat themselves in an on-farm facility and sell directly to customers.

Photo by Kyle Peveto



'IT OPENED MY EYES': AgCenter Program Instills Confidence in New Farmer

Kyle Peveto

At T. Moise Farms in Sunset, Louisiana, Tim Melancon and Monica Hernandez raise grass-fed lambs, Berkshire pigs and Angus cattle, processing the meat themselves and selling directly to a growing customer base.

While Melancon feels farming is "in his blood," Hernandez's previous work history includes years of management and selling real estate. Running a 50-acre farm presented her with a new challenge.

A one-year LSU AgCenter program for new and beginning farmers, Grow Louisiana, helped her realize the possibilities of a life in agriculture.

"It made me see farming from a different perspective. It could be a real business, rather than just a hobby," Hernandez said. "It depends on how you plan for yourself and your farm, but you can be profitable."

After growing up in Peru, Hernandez moved to San Francisco at 16 and lived in New Orleans until marrying Melancon three years ago. Melancon

grew up in a farming family and always dreamed of owning his own acreage, but the economics of agriculture at the time led him to other jobs driving trucks, working oil rigs and piloting tugboats.

When he first bought the land in St. Landry Parish, Melancon kept horses. He started the farm six years ago when he bought pigs because he wanted fresh grass-fed meat like his father raised. After selling some pork to friends, he began selling at farmers markets, and the farm kept growing.

Hernandez joined the second cohort of Grow Louisiana in 2020, attending seminars in Lafayette and meeting other beginning farmers.

"The program opened my eyes, and I learned more about the soil — the importance of soil for the future and also for the animals and the growing of the pastures," she said.

Hernandez has continued her education in the business of agriculture, earning certifications and becoming

familiar with state and federal agencies that assist producers. Two years ago, they received a grant from the U.S. Department of Agriculture to build a 1,700-square-foot meat processing plant on the farm.

Today they process and smoke their own meat, and they are building a farm store near the front gate. They also have five employees helping in the pastures and the processing plant.

Farm life isn't easy, Hernandez said, but it is gratifying.

"When I open the freezer and I see all those meats we raised, and they taste so good and I can cook anything I want, that's rewarding," she said. "When I make cakes and use our eggs and they taste better because of that, that's rewarding. When I hear people telling us that they made wonderful meals and they taste delicious because of our meats, that's awesome."

Kyle Peveto is an assistant communications specialist for AgCenter Communications and editor of Louisiana Agriculture.



■ Monica Hernandez of T. Moise Farms earned much of her farm knowledge while working on the 50-acre farm she and her husband own. The Grow Louisiana program from the LSU AgCenter helped her develop added confidence for their business.

Photo by Kyle Peveto



■ Pasture-raised pork is one of T. Moise Farms' most popular products. Tim Melancon and Monica Hernandez raise pigs and process their meat to sell directly to consumers.

Photo by Kyle Peveto

TRANSFORMING THE COMBINE

From a Weed Seed Spreader to a Weed Seed Predator

Lauren Lazaro

Several of our most damaging weeds, such as Palmer amaranth, are annuals that complete their life cycle in one growing season and reproduce by seed, thereby potentially establishing large viable seedbanks in the soil because of prolific seed production. If allowed to produce seed, the inevitable consequences will be competition in subsequent cropping years and increased populations of herbicide-resistant species. Reduction of both consequences is the primary goal of any effective weed management program.

For generations of farmers, herbicides have been the most effective tool to control weeds in crops because of ease of application, high efficacy and lower cost. Unfortunately, heavy reliance on herbicides has resulted in the evolution of herbicide-resistant weeds throughout the U.S. with six confirmed in Louisiana today. With reduced options to control herbicide-resistant weeds, adoption of integrated weed management practices that utilize multiple strategies are urgently needed.

Harvest weed seed control techniques use nonchemical practices to allow growers to target weed seed during harvest. This involves the collection and/or destruction of weed seed during grain harvest, thus minimizing or eliminating seed rain from the mature plant, which contributes to the soil weed seedbank. These various techniques can ultimately turn harvest equipment such as combines from weed seed spreaders into weed seed predators.

During harvest, the combine collects seeds retained by weeds above the harvest height along with crop grain but distributes the weed seed back across the field with crop plant residue. With harvest weed seed control techniques, the weed seed are intercepted by the combine, separated from the grain and crop residue, and either removed from the field, concentrated in a narrow band behind the combine on the ground or destroyed.

Harvest weed seed control practices should aim to supplement other measures, such as the use of herbicides, so that problematic weeds can be further minimized in a long-term approach. There are currently six approaches for producers to consider: chaff lining, chaff tramlining, chaff carts, bale direct system, narrow windrow burning and seed impact mills. LSU AgCenter weed science research is focusing on the viability of the seed impact mills and their incorporation into modern grain harvest equipment.

CHAFF LINING AND CHAFF TRAMLINING

The confinement of just the chaff material, which is plant material separated from the crop grain, into narrow rows

during harvest relies on a mulch effect to prevent weed seed germination and emergence. These narrow rows can be either on dedicated wheel tracks (chaff tramlining) or between stubble rows consisting of straw or the crown of the crop left in the ground after harvest (chaff lining). This is accomplished by attachments on the rear of the harvester that collect and place chaff into narrow rows.

The concentration of the chaff material places weed seeds in an environment unsuitable for germination and emergence. For this approach to be effective, the chaff lines need to remain undisturbed by tillage or other field operations as any disruption of the chaff layer creates opportunities for weed seedlings to emerge. Often, a banded herbicide application, which is an application directed to a given row area instead of the entire row width, a technique that can reduce the overall amount of herbicide used, is needed in the spring as the weed seed that do contact the ground are concentrated in a much smaller area.

A noncrop simulated chaff lining trial was conducted by the LSU AgCenter in Louisiana in 2021. Palmer amaranth was

seeded inside and outside of the chaff line. Additionally, seed packets that contained Palmer amaranth seed were placed inside and outside of the chaff line. Seed viability showed an average difference of 12% between inside and outside of the chaff line across retrieval timings. Weed emergence was not significantly different.

CHAFF CARTS

This relatively simple system consists of a chaff collection and transfer mechanism attached to a combine that delivers the weed seed-bearing chaff fraction into a bulk collection bin, usually a trailing cart. Once the carts are filled, they are moved outside the field, emptied and often burned to destroy seed viability. The management of the large volumes of collected chaff material is difficult and has been a primary reason for the low adoption and use of this approach.

BALE DIRECT SYSTEM

The bale direct system consists of a large square baler directly attached to the harvester that constructs bales from the chaff and straw residues exiting the grain harvester (similar to baling hay). This system serves a dual purpose of capturing weed seed and baling harvest residues that can be used for livestock feed. There does not appear to be a large market for this method, which has limited the adoption of this system.

NARROW WINDROW BURNING

Narrow windrow burning involves depositing all field residues, including weed seed, into narrow rows using a chute mounted behind the combine. These windrows are later

burned to destroy the weed seed. The chutes used for this technique are relatively inexpensive and can be fabricated and assembled on-farm. A three-year AgCenter trial funded by the Louisiana Soybean and Grain Research and Promotion Board showed no shifts in weed populations or seed shattering time were observed. However, there was a significant reduction in weed density and the weed seed present in the soil seedbank when harvest weed seed control and robust herbicide programs were used in combination.

SEED IMPACT MILLS

Seed impact mills are commercial units that are integrated into the combine. All these units utilize metal parts at high velocity to crack the seeds as they move through the mill, thereby greatly reducing their viability. The constraints to this system are the requirement of a combine with significant horsepower and being cost prohibitive for most producers with small to medium acreage. Previous research has shown these mills to greatly reduce seed viability, upwards of a 70% to 90% reduction, but the effectiveness of the system is incumbent on getting all weed seed into the seed mill.

So, which system is best? The answer is dependent on the individual producer's farming operation due to each having distinctive pros and cons. Their individual effectiveness, when combined with that of herbicides, has the potential to greatly reduce the soil weed seedbank and ensure longevity of effective herbicide usage by reducing herbicide-resistant weed seed viability.

Lauren Lazaro is a senior agronomist at Blue River Technology and an adjunct professor in the LSU AgCenter School of Plant, Environmental and Soil Sciences.



■ **A combine harvests a wheat field, leaving behind a narrow windrow.**

Photo by Lauren Lazaro

APPLYING MODERN TECHNOLOGIES

to Map Elevation Changes in Specialty Crop Fields

Phillip Lanza, Stacia Davis Conger, Jeffrey Beasley, Thanos Gentimis and Don La Bonte

Changing agroclimatic conditions and the increasing world population present various challenges to maintaining long-term food security. As such, improvements to agricultural production efficiencies achieved through technological advancements have become valuable. Studies have shown precision agriculture techniques reduce pesticide applications by 8%-10%, improve nitrogen use efficiency by 51%-97%, increase yields by 10% and improve farm profitability for various commodity crops.

Spatial analysis of field topography is an area showing tremendous potential for agricultural applications under Louisiana's agroclimatic conditions. Even minimal changes in field elevations have been found to affect both soil hydrology and nutrient mobility and availability, both of which strongly influence crop yields. Better hydrological and fertility perspectives can lead to improved management decisions that decrease production costs. Continued advancements in spatial measurement and data integration are expected to lead to further increases in resource use efficiency.

Field elevations were traditionally measured manually using surveying equipment or ground-based technologies, such as vehicle-mounted global

navigation satellite system receivers. More recently, remote sensing technologies, such as Laser Imaging Detection and Ranging (LIDAR) have become more readily available. Aerially collected LIDAR shows tremendous potential for surface elevation measurement compared to other technologies because of its ability to provide accurate, high precision and high-resolution data. It also eliminates the need to navigate terrestrial obstacles, such as vegetation and bodies of water, while collecting data.

Statewide elevation data is collected by LIDAR-equipped airplanes as part of Louisiana's frequent natural disaster response needs; however, this is cost-prohibitive for farmers needing field level accuracy. Data resolution is also limited by high aircraft speeds.

The combination of LIDAR sensor miniaturization and improvements to unmanned aerial vehicle (UAV) technology have allowed UAVs, which are commonly known as drones, to collect high resolution LIDAR elevation data. UAVs are less expensive to operate and maintain than airplanes and are capable of producing data with increased resolution because they can operate at much lower speeds and elevations. This has greatly reduced operation costs and provided increased data

collection flexibility. Greater use of this technology is expected to occur over time, empowering more stakeholders to obtain high-resolution elevation maps for their areas of interest.

The power of high-resolution LIDAR elevation data becomes clear in relatively flat areas subject to variable rainfall, irrigation or intermittent flooding issues. Small changes in elevation affect how water flows across agricultural fields, making gravity-fed irrigation methods less efficient due to poor uniformity. Employing UAV-mounted LIDAR sensors to collect elevation data within and adjacent to fields provides a more complete picture of topographical feature effects and helps to maximize water use management. This information can allow more efficient selection and placement of best management practices (BMP). For example, buffer strips that filter surface runoff to improve water quality and minimize erosion can be installed in key locations where drainage naturally occurs rather than surrounding the entire field.

LSU AgCenter scientists conducted a study in 2021 to determine the optimum UAV flight altitudes for mapping specialty crop fields in north-eastern Louisiana. Data were collected over two fields using UAV-mounted LIDAR sensors at 40-, 50- and 60-meter altitudes, with lower

altitudes producing higher resolution LIDAR datasets. A higher altitude is advantageous given a faster flight time and lower computing and labor expenses if resolution is nearly the same.

Elevation data were spatially analyzed to determine statistical significance between digital elevation models (DEMs) generated from data collected at each altitude. It was determined that no significant differences existed between digital elevation models. Therefore, flying at an altitude of 60 meters provides greater efficiency with lower operational costs for UAV LIDAR data collection. The figures on the next page show color enhanced side-by-side digital elevation models of two specialty crop fields collected at each elevation.

The two site maps clearly identify low lying areas within the fields and where each field drains to the natural environment. Figure 1 indicates westward movement of water due to the leveed bayou on the eastern field border. There are four to five areas of dark color on the western border where drainage is already being channeled; the implementation of best management practices should be focused in those areas. Similarly, Figure 2 indicates that most drainage occurs in the southeast portion of the field where a naturally occurring

bayou exists. Implementation of best management practices should be focused on the two southeastern corners where drainage naturally occurs.

The elevation maps provide valuable information to stakeholders when making decisions involving irrigation and drainage and when strategizing implementation designs of various best management practices. Use of this technology will likely increase as sensor and UAV costs decrease and greater education occurs regarding applicability. Determining optimized flight characteristics during data collection, which was done in this study, will further reduce associated costs. This will likely lead to more continuous, more complete high-resolution elevation data coverage as more people use this technology.

Phillip Lanza is a doctoral student at Cornell University. He completed a Master of Science degree in precision agriculture in 2021. Stacia Davis Conger is an assistant professor and irrigation specialist at the AgCenter Red River Research Station. Jeffrey Beasley is a professor in the AgCenter School of Plant, Environmental and Soil Sciences. Thanos Gentimis is an assistant professor in the AgCenter Experimental Statistics Department and Don La Bonte is a professor in and director of the School of Plant, Environmental and Soil Sciences.

Figure 1

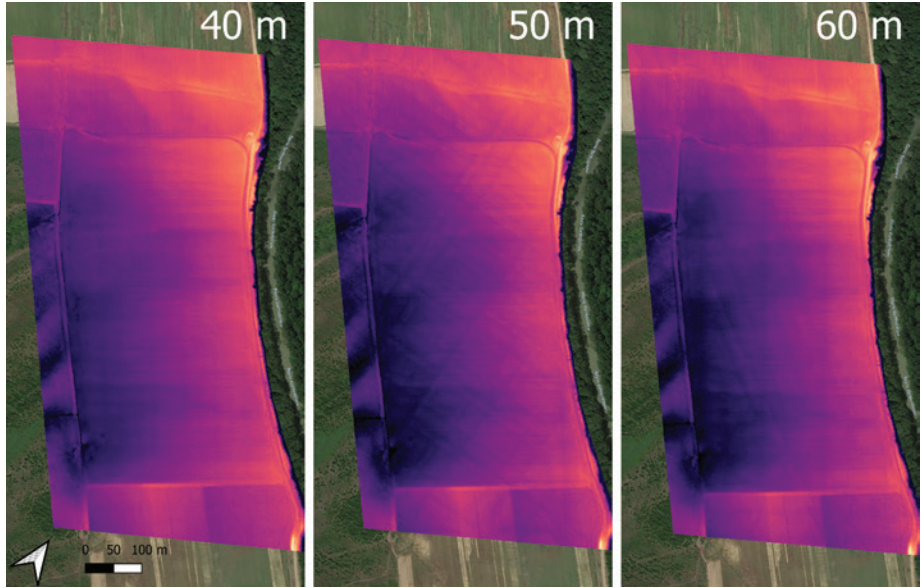
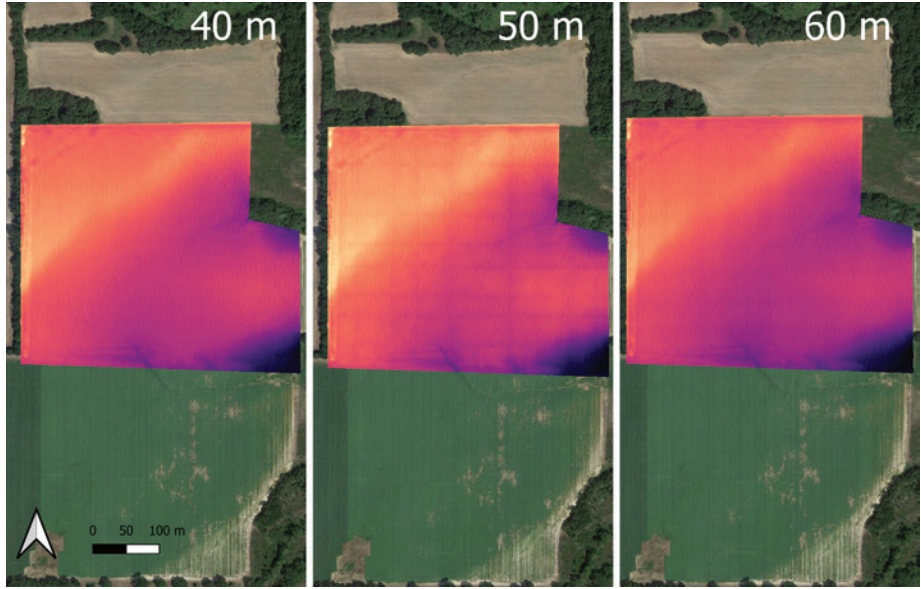


Figure 2



■ Digital elevation maps of a specialty crop field were created from Laser Imaging Detection and Ranging (LIDAR) point cloud data collected at 40 meters, 50 meters and 60 meters. Darker colors are lower elevations. Because no significant differences exist between digital elevation models, flying at an altitude of 60 meters provides greater efficiency with lower operational costs for unmanned aerial vehicle LIDAR data collection.

Figures by Phillip Lanza

RAISING PUMPKINS and FUTURE FARMERS

Kathryn K. Fontenot and Beth B. Putnam

In 2020, while summer activities across the state were slowly canceled due to COVID-19 restrictions, LSU AgCenter employees were determined to keep youths engaged in agricultural endeavors. They developed a pumpkin growing contest with the goal of providing children with an activity they could do at home that would teach them about farming. Many young people were stuck at home, so the extra time could easily be spent in the garden.

Participants were recruited by 4-H agents throughout the state. Approximately 600 4-H members from 46 parishes participated in 2020, and 236 4-H members in 30 parishes participated in 2021. Each registered child received packets of Cinderella and Atlantic Giant pumpkin seeds and a planting guide. Growing pumpkins is no easy task in Louisiana. Participants battled cucumber beetles, worms, squash vine borers, fungi, wildlife, livestock, humidity, rain, weeds and two hurricanes in 2020 and very similar conditions in 2021. They competed in five categories: heaviest pumpkin, smallest (pollinated) pumpkin, most uniform pumpkin, most unique pumpkin, and best kept records. In mid-October of both years, 4-H'ers turned in their pumpkins for official weights and judging. Certified scales were provided by the Louisiana Department of Agriculture and Forestry Division of Weights and Measures to ensure all entries were treated fairly.

Overall, youth participating in this contest did a wonderful job. We were impressed by every entry. Each participant should be proud. Pumpkins are not an easy crop to grow as they are susceptible to worm, slug and snail damage as well as many diseases and viruses. We hope these students continue gardening throughout their lives, and our fingers are crossed that a few of them may even consider agriculture as a future career path. Great job 4-H'ers! Keep gardening!

Kathryn K. Fontenot is an associate professor in the LSU AgCenter School of Plant, Environmental and Soil Sciences, and Beth B. Putnam is a 4-H Youth Development agent in Washington Parish.



CARLISLE TOMLINSON
East Carroll Parish



ALEX PATIN
West Feliciana Parish



ANDREW GODKE
West Feliciana Parish

WINNERS

MOST UNIQUE PUMPKIN

Unique pumpkins were those that had interesting ripening patterns and atypical shapes.

2020:

Collin Nortman — Beauregard Parish

2021:

Carter Ryan — Concordia Parish

MOST UNIFORM PUMPKIN

Uniform pumpkins are those with perfect shape and consistent color on all sides of the fruit. The fruit must be a perfect circle from overhead and even width all around from the bottom of the pumpkin (blossom-end) to the shoulders. Cinderella pumpkins are not jack-o'-lantern types. This variety is actually a winter squash and has a squat shape rather than round. Interestingly, it was this very pumpkin variety that cartoonists used to draw and imagine Cinderella's pumpkin carriage.

2020:

Amanda Croxton — Lincoln Parish

2021:

Andrew Devillier — Pointe Coupee Parish

BEST RECORDS

Record books that excelled included detailed notes from seeding through harvest and photographs to accompany. Winners included weekly observations detailing items such as first female flower appearance and charting leaf measurements. Winners also discussed methods they used to ward off pests.

2020:

Isabella Sims — Caddo Parish

2021:

Benjamin Brock — St. John the Baptist Parish

LARGEST PUMPKIN

Violet's pumpkin weighed a whopping 68.5 pounds. This growth is stunning, as Cinderella pumpkins often average between 25 and 35 pounds each. Violet was able to double it. We want your fertilizer secrets, Violet!

2020:

Violet Stockton — Lincoln Parish
68.5 pounds

2021:

Lily Darch — Caddo Parish
42.42 pounds

SMALLEST PUMPKIN

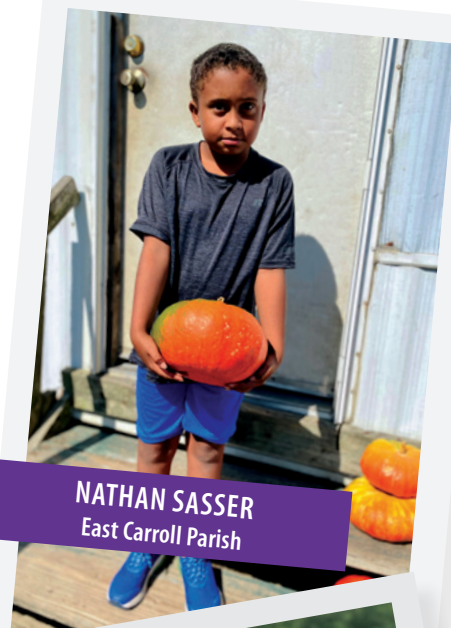
To be eligible for the smallest pumpkin category, the pumpkin had to be fertilized. Students could not turn in an unfertilized ovary.

2020:

Carlisle Tomlinson — East Carroll Parish
1.4 pounds

2021:

Andrew Godke — West Feliciana Parish
1.6 pounds



NATHAN SASSER
East Carroll Parish



LANDRY BROUILLETTE
West Feliciana Parish



WYATT CONLEAY
Tangipahoa Parish

VIOLET STOCKTON



During the COVID-19 pandemic in 2020, Violet Stockton had too much free time on her hands. So, the Lincoln Parish 4-H'er grew a prize-winning pumpkin.

"I was very bored," she said. "And I was just like, 'I might as well grow something.' And they were doing a vegetable growing contest, so I grew a pumpkin."

The pumpkin was of the Cinderella variety, which usually grows to 25 to 35 pounds, according to Kathryn "Kiki" Fontenot, an LSU AgCenter extension horticulturist and researcher. Violet's was 68.5 pounds.

Violet, who is now 13, discussed the gigantic pumpkin.

HOW DID YOUR PUMPKIN GET SO BIG?

I honestly don't know. It just kept on growing and growing. I watered it and took care of it like a regular pumpkin and fertilized it, and it just kept on growing. I couldn't pick it up. I was shocked. And I didn't know it could get to be that big.

WHAT WAS THE COOLEST PART OF GROWING PUMPKINS?

It was really cool to watch it grow and how quick it grew. And it's just so fascinating because I didn't realize how quick plants grew.

WHAT WERE THE MOST IMPORTANT LESSONS YOU LEARNED FROM GROWING PUMPKINS?

Patience and responsibility. I had to be really patient because I had to wait for it to grow. And it kind of went quickly, but I had to remember to water it every day.

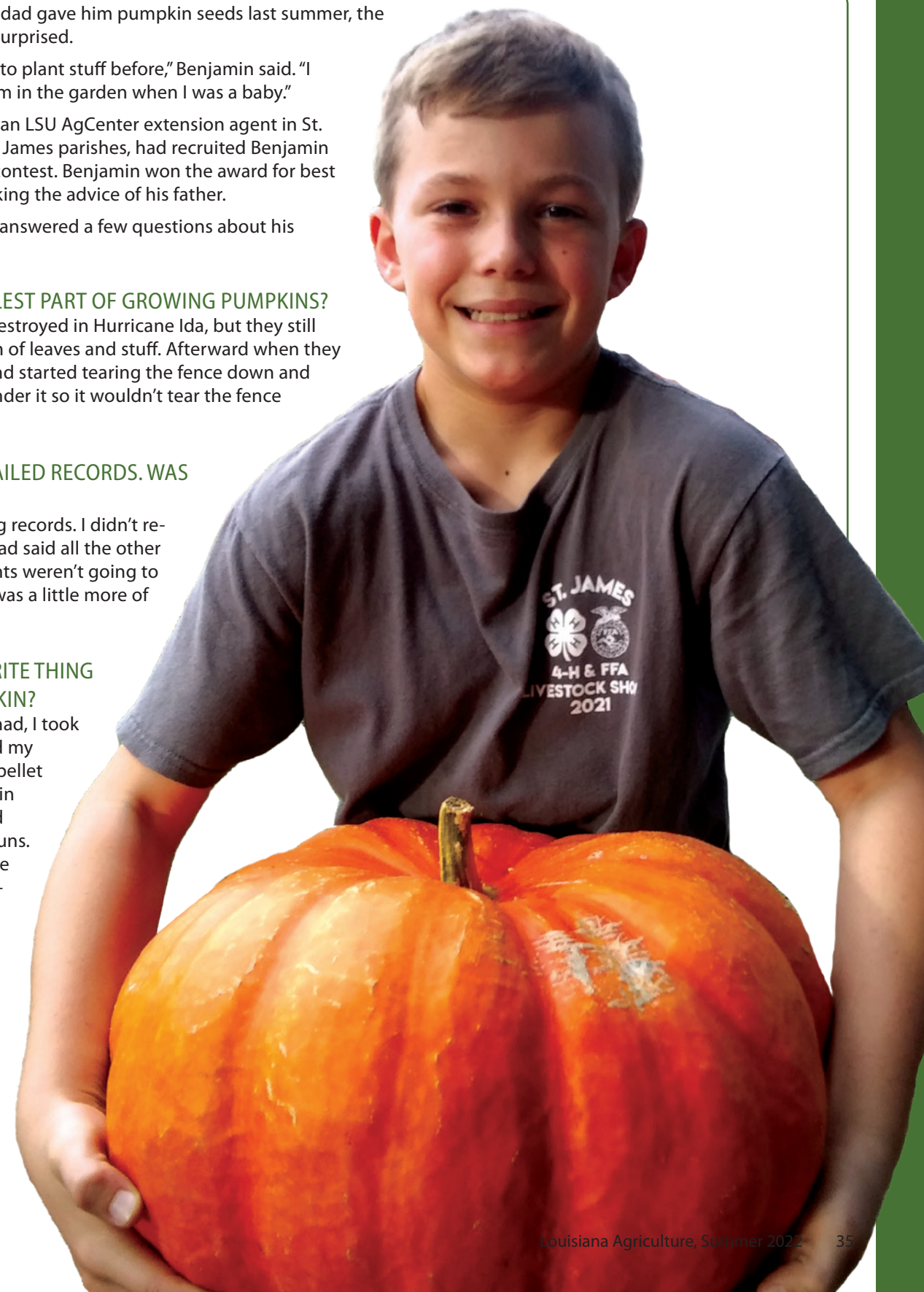
WHAT IS YOUR FAVORITE THING TO DO WITH A PUMPKIN?

Carve it. Carving pumpkins for Halloween — it's so fun. I did a cat once, and that was extremely fun to do.

- Kyle Peveto



BENJAMIN BROCK



When Benjamin Brock's dad gave him pumpkin seeds last summer, the 11-year-old wasn't too surprised.

"My dad has gotten me to plant stuff before," Benjamin said. "I started working with him in the garden when I was a baby."

His father, Andre Brock, an LSU AgCenter extension agent in St. John the Baptist and St. James parishes, had recruited Benjamin to a pumpkin growing contest. Benjamin won the award for best record-keeping after taking the advice of his father.

This summer, Benjamin answered a few questions about his pumpkin patch.

WHAT WAS THE COOLEST PART OF GROWING PUMPKINS?

The fact that they got destroyed in Hurricane Ida, but they still came back with a bunch of leaves and stuff. Afterward when they climbed up the fence and started tearing the fence down and we had to put a chair under it so it wouldn't tear the fence down.

YOU TOOK VERY DETAILED RECORDS. WAS THAT YOUR IDEA?

So, I was fine with taking records. I didn't really feel like it, but my dad said all the other kids, most of their parents weren't going to make them do it. So, it was a little more of an incentive.

WHAT IS YOUR FAVORITE THING TO DO WITH A PUMPKIN?

The pumpkins that we had, I took a small one, and me and my brother, we each had a pellet gun. We put the pumpkin maybe 10 feet away and shot it with our pellet guns. On the Fourth of July, we got those dynamite firecrackers and put it in a pumpkin and blew off a piece of it.

- Kyle Peveto

ST. JAMES
4-H & FFA
LIVESTOCK SHOW
2021

Inside:

Camp Grant Walker, the 4-H camp in central Louisiana, is turning 100. For a century, 4-H'ers have been making memories and friendships at the campground. This summer campers returned for in-person sessions for the first time since the COVID-19 pandemic began in 2020.
See Page 9

The LSU AgCenter Grow Louisiana program helps new farmers learn what they need to succeed in the business of agriculture. Two women who took part in the program say that Grow Louisiana opened their eyes to the possibilities of a farm-based business.
See Page 22

For years agricultural producers have relied on herbicides to fight weeds. Other effective weed control methods are being researched, including harvest weed seed control techniques, some of which use a combine to destroy weed seeds.
See Page 28

In 2020, when many summer activities were canceled, 4-H'ers from across Louisiana began growing pumpkins. The competition, which continued into 2021, helped these young people learn about the basics of farming in a firsthand manner.
See Page 32



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