



LOUISIANA Agriculture

VOL. 66, NO. 2, SPRING 2023
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ENSURING OUR FUTURE THROUGH SCIENTIFIC RESEARCH AND EDUCATION

**THE REBIRTH OF LOCAL
FOOD SYSTEMS**

**SEEDS TO SUCCESS:
THE LOUISIANA FARM TO
SCHOOL PROGRAM**

FOOD IS LIFE

■ CARL MOTSENBOCKER

It is a pleasure to introduce the spring edition of Louisiana Agriculture focused on Seeds to Success: The Louisiana Farm to School Program and our local food systems efforts. The LSU AgCenter's farm to school program was established in 2016 with U.S. Department of Agriculture funding from the Louisiana Department of Education.

The farm to school movement fills a demand from the public to know where our food comes from and to learn life-long skills and habits, such as eating healthily and gardening. It also promotes community health and happiness and economic development in our rural and urban communities while supporting small- to medium-scale sustainable farms. The COVID-19 pandemic demonstrated that the industrial food system, with food produced at long distances and purchased from markets, is not sustainable. We need to reinvigorate our food system to support local and regional food systems and support local farms that grow nutritious, locally produced food.

As a lifelong gardener, 4-H member and son of a regional commercial vegetable extension educator, I learned early the practice, skill and art of gardening. Having a garden and fruit trees and berry brambles for us was a chore at times, but we welcomed the harvest and the home-cooked meals. Local produce was prized for its fresh flavors, and we learned how to preserve bountiful harvests to enjoy fruits and vegetables throughout the year. My first school garden was four decades ago in northeast Thailand, and I still remember the joy of elementary school children harvesting their own vegetables and consuming them on the school grounds. My LSU students have supported many gardens and enjoyed interaction with students and the community. Gardening and growing



Carl Motsenbocker, the executive director of Seeds to Success: The Louisiana Farm to School Program, picks Swiss chard from a garden he established to grow donations for the LSU Food Pantry at the Hill Farm on the LSU campus in Baton Rouge. Photo by Olivia McClure

food is a passionate affair and one that deserves to be nurtured and supported. Farm to school programming is often a part of the journey.

There are many engaged in farm to school in Louisiana who are at the forefront of changing people's lives. The teacher who has an indoor classroom growing system so that their class can fully engage in learning about plants and growth. The school nutrition director who actively seeks local products and modifies recipes to provide a fun and wholesome meal in the cafeteria. The farmer who is willing to bring strawberries to a school district so students can participate in a Louisiana Harvest of the Month taste test. The community member who volunteers weekly and assists with the school garden and integrating classroom lessons into farm to school activities. The 4-H agent who uses gardening and seasonality while teaching the impor-

tance of eating healthy. All of these are just a few examples of "heroes" of farm to school and local food systems.

Farm to school is an opportunity to benefit the economic, social and educational fabric here in Louisiana. Seeds to Success: The Louisiana Farm to School Program has a great team that continually develops resources to support and implement farm to school programs, providing trainings and consultations and engaging the community while collaborating with local partners to nurture this growing movement. We invite everyone to unite with us to sustain a more resilient food system through education and collaboration and to increase economic opportunity and build a just, equitable food system in Louisiana.

Carl Motsenbocker is a professor in the LSU AgCenter School of Plant, Environmental and Soil Sciences and is the executive director of Seeds to Success: The Louisiana Farm to School Program.

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ON THE COVER:

Carl Motsenbocker, the executive director of Seeds to Success: The Louisiana Farm to School Program, picks strawberries at a garden plot at Hill Farm on the LSU campus.

Photo by Olivia McClure

- 4** AgCenter News
- 5** From Our Social media
- 6** College of Ag News
- 7** Faculty Profile: Farm to School Program Combines Besse's Expertise in Public Health, Extension
KYLE PEVETO
- 8** Back to Basics: The Rebirth of Local Food Systems
CARL MOTSENBOCKER AND CRYSTAL BESSE
- 10** Cultivating Change: Louisiana Farm to School Program Connects Students to Full Plates and Healthy Habits
CRYSTAL BESSE AND CELESTE FINNEY
- 12** Celebrating Fresh Flavors of Louisiana Farms
CELESTE FINNEY AND CRYSTAL BESSE
- 14** Seeds to Success Spotlight: Armstrong Farms
TYNE BANKESTER
- 16** The Economic Benefit to Louisiana When Schools Purchase Local Foods
WHITNEY MCKINZIE, MARIA BAMPASIDOU, CRYSTAL BESSE AND CELESTE FINNEY
- 18** Seeds to Success Spotlight: Leadership Workshops
JACEY WESLEY

- 20** Expanding Producer Markets: A Relationship for Success
CRYSTAL BESSE, CARL MOTSENBOCKER AND PAMELA HODSON
- 22** Seeds to Success Extension Spotlight: Jessica Randazzo
CRYSTAL BESSE
- 24** Seeds to Success Spotlight: Showcasing Model Programs, Diverse Speakers at Annual Conference
JACEY WESLEY, TYNE BANKESTER AND PAM HODSON
- 26** School Gardening With Purpose: Supporting Educators With Seeding LA
TYNE BANKESTER AND JACEY WESLEY
- 28** Encouraging Schoolchildren to Explore Nutritious Foods
KYLE PEVETO
- 30** Seeds to Success Teacher Spotlight: Melissa Starks
TYNE BANKESTER

RESEARCH REPORTS

- 32** Stratified Substrates: A Synergistic Substrate System to Improve Resource-Efficient Crop Production
JEB S. FIELDS AND KRISTOPHER CRISCIONE
- 34** Container Grown Vegetables for Home Gardeners
HEATHER KIRK-BALLARD, KATHRYN FONTENOT AND EDWARD BUSH

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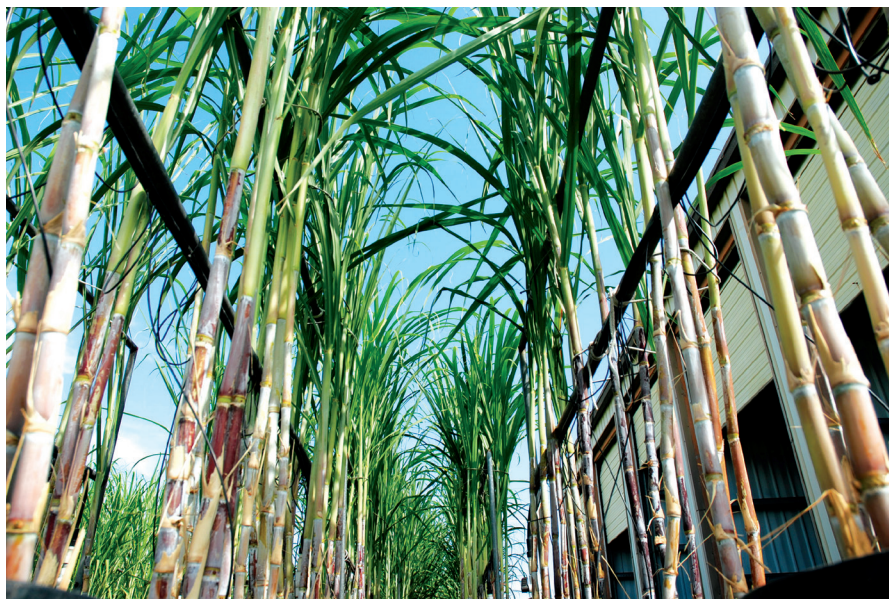
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Harry L. Laws & Company donated \$250,000 to the LSU AgCenter to help genetic research. LSU AgCenter file photo

VARIETY DEVELOPMENT IS CRUCIAL TO THE LOUISIANA SUGARCANE INDUSTRY.

“It’s been the major driver for doubling yields between 1930 and 1970, and then, again, we doubled yields from 1970 to today,” said AgCenter sugarcane specialist Kenneth Gravois.

Crop breeders say it generally takes 12 years for a new variety to be released.

To help the Louisiana sugarcane variety development program, Harry L. Laws & Company donated \$250,000 to the LSU AgCenter to help genetic research. The company is a majority owner in the Catherine Sugar Company in West Baton Rouge Parish and an owner of agriculture and recreation-related land. This donation is expected to improve sugarcane genetic research and help with selecting new varieties.

■ CRAIG GAUTREAUX

HORTICULTURE RESEARCHER, STUDENT RECOGNIZED

Two horticulture associations have recognized Jeb Fields, the AgCenter consumer horticulture extension specialist, and a graduate student working with Fields’ lab for their work on ornamental plant production and resources efficiency.

Fields was awarded the Distinguished Service Award from the Louisiana Nursery and Landscape Association. He was also awarded the John E. Hutchison Extension Award from the Southern Region American Society of Horticulture Science, which is given to a young extension horticulturist to recognize valuable contributions to horticulture.

Kristopher Criscione, a doctoral student working with Fields, was awarded the Childers Graduate Student of the Year Award and the Outstanding Graduate Student of the Year from the Southern Region American Society of Horticulture Science

“These four awards all in a short time are very exciting for my lab and the forward direction of our program,” said Fields, who is stationed at the Hammond Research Station.

■ KYLE PEVETO

AGCENTER SCIENTIST WINS NATIONAL PUBLIC RELATIONS HONOR FOR NEMATODE WORK

As a nematologist with the LSU AgCenter, Tristan Watson is accustomed to his work earning the recognition of scientific organizations. Now he can add a public relations accolade to his résumé, too.

The Public Relations Society of America recently presented its Silver Anvil Award in Issues Management to Watson and other members of The SCN Coalition, which developed a national campaign to educate soybean farmers about nematode issues. The group is composed of university scientists from 28 states and a Canadian province, grower checkoff programs, corporate partners and the MorganMyers marketing and public relations agency.

The soybean cyst nematode, or SCN, is a parasitic roundworm that feeds on soybean roots and can decrease yields by nearly 25%. It is a major concern in many states, but not in Louisiana, where other nematode species are bigger issues. The SCN Coalition aimed to educate growers on diagnosis and management of all major nematode pests of soybeans in the United States.

■ OLIVIA MCCLURE

TRISTAN WATSON

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, LinkedIn and TikTok.

Join the conversation by following the LSU AgCenter.



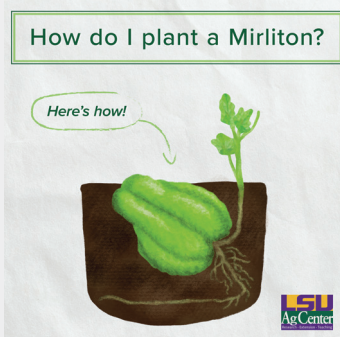
FACEBOOK

FOLLOW THE AGCENTER AT

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MARCH 28 | The vegetable pear, also called mirliton, chayote or mango squash, is usually planted in the spring after the danger of frost is over. View the AgCenter's publication to learn how to grow them:

tinyurl.com/GrowingMirlitons



INSTAGRAM

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INSTAGRAM.COM/LSUAGCENTER

MARCH 27 | Apple snails are an invasive species in Louisiana. They lay bright pink egg masses on structures and plants emerging from the water.



YOUTUBE

VIEW THIS VIDEO AND OUR EXTENSIVE ARCHIVE AT

YOUTUBE.COM/USER/LSUAGCENTER

MARCH 10 | An exceptionally warm February has helped kickstart Louisiana's crawfish season. While the catch has improved, high production costs are making it difficult for farmers and consumers. LSU AgCenter correspondent Craig Gautreaux has this report from southwest Louisiana.



TWITTER

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TWITTER.COM/LSUAGCENTER

MARCH 31 | Wishing @KIMMULKEY and the Lady Tigers good luck today in the Final Four! Geaux Tigers!



LINKEDIN

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FEB 13 | Prasanta Subudhi, LSU AgCenter crop geneticist, received a \$10 million grant from the U.S. Department of Agriculture to develop climate-resilient rice. #RESEARCH #LSUAGCENTER



TIKTOK

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MARCH 13 | Bull thistle, *Cirsium horridulum*, also known as yellow thistle or chadrons, is an edible weed. LSU AgCenter research associate David Sexton demonstrates how to forage for thistle and how to prepare it!



■ ANNABELLE LANG

LSU STUDENTS ARE BACK ABROAD

LSU College of Agriculture had nine students spend their spring break in the Czech Republic as part of a 10-day study abroad program. The students spent the week visiting Mendel University (MendelU), a longtime partner with LSU, in Brno and Prague.

Facility tours of MendelU introduced students to the academic offerings of the university and the higher education model in the Czech Republic. Students participated in farm tours highlighting precision agriculture and alternative animal husbandry facilities, including visits to

a fully automated dairy farm and Mendel's horticulture facility in Lednice.

In Prague, students toured Old Town and explored prominent landmarks, including Charles Bridge and the Prague Castle, to deepen their understanding of the city's history.

Students enrolled in an elective course offered through the LSU College of Agriculture to prepare them for international travel while creating a baseline knowledge of Czech agriculture, history, culture and Czech vocabulary.



Nine LSU College of Agriculture students spent their spring break in the Czech Republic, and one of their stops included the Lednice Castle. Photo by Henry Hebert

STUDENTS EXPAND LSU COMMUNITY GARDEN DURING NATIONAL AG WEEK

LSU College of Agriculture student volunteers completed a service project to install six new raised garden beds at the Hill Farm Community Garden on campus. The service project, which aimed to expand the garden and provide more opportunities for students to learn about agriculture and gardening, was completed with the help of volunteers who assembled the beds, moved dirt and ran irrigation lines.

The new garden beds will allow more students to engage with agriculture by growing vegetables and herbs on campus. Volunteers were asked to wear comfortable clothing that they could work in and meet at the Hill Farm, where Ag Student Association (ASA) representatives were available to guide them.

The project was part of LSU's annual Ag Week celebrations, which have always included a service component. LSU Student Government funded the project, and LSU horticulturist Kiki Fontenot played a pivotal role in helping plan and execute the addition of the six new garden beds.

"Service has always been a component of our annual Ag Week celebrations. I was thrilled when our Ag Student Association officer team pitched the idea of working with the Hill Farm Community Garden right here on campus," said Ashley Grant, adviser for ASA.

The success of the project is a testament to the hard work and dedication of the LSU College of Agriculture students and their collaborative efforts with volunteers and community partners.

VICE PRESIDENT'S DIVERSITY GRADUATE ASSISTANTSHIP SPOTLIGHT: DOCTORAL STUDENT TIA SANDERS

Tia Sanders is a doctoral student in the School of Nutrition and Food Sciences and a recipient of the Vice President's Diversity Graduate Assistantship.

Originally from Pensacola, Florida, Sanders received her bachelor's degree in biology and nutrition and a master's in biotechnology from Alcorn State University. She decided to pursue the area of nutrition and food sciences after her mother became ill. This motivated her to start paying more attention to the nutritional value of the foods around her.

"There are certain foods that are more cancer-related than others. Certain foods help benefit your body to help get you better, which influenced me to investigate what could speed up the recovery process," said Sanders.

Sanders is also a recipient of the prestigious National Science Foundation Louis Stokes Alliances for Minority Participation (LSAMP) Bridge to Doctorate Fellowship. She is the first student in an agriculture-related program to receive this fellowship.

With funding allocated by her fellowship, Sanders is researching the health benefits of proteins found in hemp plants. She plans to utilize the soy protein present in hemp to make cheese.



TIA SANDERS

FARM TO SCHOOL PROGRAM COMBINES BESSE'S EXPERTISE IN PUBLIC HEALTH, EXTENSION

■ KYLE PEVETO

The face of the Harvest of the Month series on Louisiana Public Broadcasting, Crystal Besse does her homework to ensure she nails the history and culture of her adopted home.

Besse followed a career in public health from her native Tennessee to Louisiana, and five years ago she became director of Seeds to Success: The Louisiana Farm to School Program.

For the most visible aspect of her role, Besse researches the history of beloved Louisiana foods before writing scripts for the well-received series, which takes her to crawfish farms, rice fields and other agricultural sites across the state.

"I want to make sure that I honor the history of Louisiana," she said. "I want to still cover the horticulture side, but I also want to cover the meaningfulness of it to the citizens of Louisiana."

Away from the camera, Besse works to connect Louisiana schools to local foods and the people who grow them. Seeds to Success works to educate students and school staff about nutrition, agriculture and local foods. The program also helps schools purchase more locally grown foods and helps teachers and students grow gardens.

Growing up in east Tennessee, Besse's father raised pointing breed dogs for hunting and kept Tennessee walking horses, and Besse participated in 4-H, joining cooking contests and baking biscuits at the local fair. She spent a great deal of time on the tobacco farm owned by the family of her longtime babysitter, Bonnie, where she would help set tobacco.

"I understood how essential the success of those plants was, how your family's livelihood would depend on them," she said.

Bonnie became like a grandmother to Besse, introducing the once-picky child to new foods and taking her along as she sold Avon around town.

"She taught me to really care for people," Besse said. "And she taught me to be a focused person and to go for your dreams."

Her dream of working in fashion led her to major in family and consumer sciences at East Tennessee State University. However, after managing a retail clothing store, she wanted a career change. She found a job she loved as a family and consumer science and 4-H agent with the University of Tennessee Institute of Agriculture.

While teaching canning and cooking and working with 4-H'ers, Besse also joined forces with other agencies including the Department of Public Health, which led her to study epidemiology in graduate school.

"I like working with people, and I didn't want to work in a clinical setting," she said. "Public health opened that door for me to do both."

After earning a master's of public health, she was hired by the Northeast Tennessee Regional Health Office to investigate foodborne outbreaks, and served on the board of examiners for the Tennessee Center for Performance Excellence. A fellowship with the Louisiana Department of Health led her to Baton Rouge.

When Besse joined the AgCenter Louisiana Farm to School Program in 2017, she was excited to dive back into extension work.

"It just was the perfect fit because I can bring my public health background and my extension and family and consumer sciences background," she said. "It all came back together again. I'm back in extension doing things that I love to do."

Besse's love of local foods and horticulture extends to the home, where she keeps a garden year-round. She and her husband love spending time with their 3-year-old, Gemma, as well as exploring the outdoors and tending to their vegetables.

The Louisiana Farm to School Program has great potential to help children and agricultural producers, Besse said.

"I feel like this program is still growing," she said. "I want to continue that growth. There's a lot of people out there that use our resources and love it, but there are many who haven't heard of us. We just want to be spreading the word and continuously trying to improve."

Kyle Peveto is the editor of Louisiana Agriculture.



Crystal Besse, director of Seeds to Success: The Louisiana Farm to School Program, takes Louisianians on a tour of farms each month in the Harvest of the Month video series. Photo courtesy of Louisiana Public Broadcasting



*Photo by Brooke DeCubellis, U.S.
Department of Agriculture Natural
Resources Conservation Service*

BACK TO BASICS:

THE REBIRTH OF LOCAL FOOD SYSTEMS

■ CARL MOTSENBOCKER AND CRYSTAL BESSE

In the early part of the 20th century, almost 40% of Americans lived on farms, and most food was locally grown and marketed in the community. Consumers relied on their local community and seasonal products as well as preserving foods. After World War II, transportation networks and national chain grocery stores were developed, and refrigeration allowed food products to be stored and shipped long distances. Production concentrated in centralized areas of the country, such as growing areas in California, with products shipped to distant markets and grocery stores. Today, this is the predominant food system, or

conventional food system, that supplies food throughout the country and the world. A majority of food is grown a long distance from where it is consumed and travels down long supply chains.

Consumers are increasingly interested in purchasing local foods as many consider the perceived benefits of freshness, higher quality and better flavor for locally grown products, such as fruits, vegetables and meat products. Locally grown foods are full of flavor, as crops are picked fully ripe rather than being harvested early in order to be shipped and distributed long distances. Many times, produce at local markets has been

picked within 24 hours of purchase. Consumers also consider the impact of purchasing locally on local or regional economic development, health and environmental quality. Local foods represent a small but growing share (less than 4%) of the U.S. agricultural food system. The term “local food” generally refers to food produced near to where it is consumed, but there is no consensus on what actually constitutes local. For many, local may refer to production within a certain distance, such as 50 to 100 miles, or in a geographic region or state.

Local food producers sell their goods directly to consumers through farmers

markets, on-farm stores or pick-your-own operations. They also sell to retailers, such as restaurants or grocery stores; institutions, such as schools, universities, or hospitals; and intermediaries, which include processors or wholesalers. An example of increased demand for local farm products is consumer purchases directly from producers at farmers markets; the number of U.S. farmers markets increased from 1,755 markets in 1994 to over 8,700 in 2019. Local and regional food systems provide significant income for many farmers, which supports rural businesses and communities, beginning and small-scale farmers, and intermediaries (those that purchase directly from farmers) involved in the local food system.

The COVID-19 pandemic demonstrated the issues with the conventional food system and mass food production, highlighting extensive food insecurity and lack of food access throughout the country. The current system utilizing centralized growing areas and then shipping food products long distances to markets was under stress with disruptions in supply, leading to access issues.

To better understand the complexity of food systems, they are often represented as having six stages (Figure 1). A healthy food system begins with the producer and production of food products, followed by processing and packaging, and then distribution. Next is access to food and subsequently consumption. The last stage, waste, is actually exhibited in all stages, and it is estimated that as much as 30% to 40% of food is wasted in the United States. Above all, these stages are inter-related, and all are directly impacted by the political system and policies, natural resources, the social system and, perhaps most importantly, the economy.

An alternative to the conventional food system's long supply chains is more local and regional-based food production. This shift can lead to shorter, more direct supply chains, which are less prone to the pressures seen recently

causing disruptions in distribution and access for millions of consumers. Examples of more direct models of food distribution and consumption are farmers markets, community supported agriculture (CSA), pick-your-own operations, selling directly to grocery stores and restaurants, and direct sales to institutions, such as hospitals and schools. These direct marketing options, known as short food supply chains, are attracting interest for their potential to bring about social, environmental and economic benefits.

The social benefits include an enhanced cohesion of social and community networks, higher farmer autonomy and bargaining power, more transparency and mutual trust, and greater consumer awareness and knowledge of local food. Environmental benefits include reduced food waste, minimal use of packaging, shortened distances between production and consumption, improved animal welfare conditions and promotion of organically or sustainably grown food. The economic benefits include supporting the local economy; fairer prices for farmers; better access to fresh, seasonal and nutrient-dense foods for consumers; improved market access for small-scale producers; and higher profit margins for intermediaries.

Seeds to Success: The Louisiana Farm to School Program provides support for Louisiana schools to purchase directly or through intermediaries from local farmers and leads the signature Louisiana Harvest of the Month initiative, a celebration of local foods, creating increased demand for local and regional products in schools. In addition, the U.S. Department of Agriculture's Agricultural Marketing Service recently awarded over \$64 million for 185 grant projects to expand and strengthen local and regional food systems and increase the availability of locally grown agricultural products, thereby highlighting many great opportunities for sourcing local products from our Louisiana producers, ranchers and fishers. The benefits of local food systems are endless, with the greatest benefit being the connection the systems bring, both on a personal level in the food we eat, as well as the impact it can have on Louisiana communities and shortening food supply chains.

Carl Motsenbocker is a professor in the School of Plant, Environmental and Soil Sciences and is the executive director of Seeds to Success: The Louisiana Farm to School Program. Crystal Besse is the program director of Seeds to Success.



Figure 1: The six stages of a healthy food system are depicted in this illustration. Illustration by Jacey Wesley

**CHILDREN LEARN TO COOK
FRESH LOCAL FOODS AT A
GARDEN TO TABLE EVENT.**

Photo by Crystal Besse

CULTIVATING CHANGE: LOUISIANA FARM TO SCHOOL PROGRAM CONNECTS STUDENTS TO FULL PLATES AND HEALTHY HABITS

■ CRYSTAL BESSE AND CELESTE FINNEY

An elementary school implements a gardening and culinary program to teach students how to prepare recipes using produce grown in their own school garden through the help of a local farmer.

A school district makes changes to its nutrition policy and introduces a life skills course that includes using a vocational kitchen and raising a school garden whose produce is sold at the local farmers market and included in cooking demonstrations for the community.

An urban middle school holds a ceremony to celebrate students' engineering and science achievements through the use of an aquaculture system to raise fish and grow lettuce, which are in turn

sold to the school cafeteria and other markets.

What do these three scenarios have in common? They all utilize the three main components of the nationwide movement termed "farm to school." Through the three pillars — hands-on gardening experience; opportunities to try local, seasonal produce; and participating in educational activities related to agriculture, food, health or nutrition — farm to school not only enhances the learning environment but can also lead to improved eating habits for students throughout the state. Farm to school activities like growing a garden, taste tests and learning where our food comes from encourage students to expand their

food experiences by encouraging them to try and like new foods.

When a child grows a carrot or grows kale, the resistance to try it fades away. Suddenly, they are not only willing to eat it, but there's a sense of pride and accomplishment as well. And it's contagious. The number of schools and districts that work with the Louisiana Farm to School Program is growing. Rising support from communities provide a substantial boost to schools, creating more robust farm to school activities and school gardens.

The Louisiana Farm to School Program began in 2016 with U.S. Department of Agriculture funding made possible through an interagency agreement



Educator Lori Long Watkins uses a Seeds to Success lesson to teach preschool students in Winnsboro. Photo by Lois Jordan

between the LSU AgCenter and the Louisiana Department of Education. Since 2021, the Louisiana Farm to School Program has been rebranded as Seeds to Success: The Louisiana Farm to School Program to better capture the potential and full scope of how farm to school impacts local food systems in our state. The goal for Seeds to Success is to empower communities to transform food systems through local food sourcing and nutrition and agriculture education in Louisiana school systems and beyond. Over the past three years Seeds to Success has created a resource-rich website; expanded the Louisiana Harvest of the Month portfolio to 20 Louisiana products; and produced crop-specific, field-to-fork videos, taking viewers on a virtual farm tour. All the while, Seeds to Success sustains the effort to connect Louisiana farmers and producers with school systems to provide fresh food for their hungry and often food-insecure students through the program's materials, resources and producer database.

This hands-on approach to learning about food encourages students to make healthy choices, an approach

that has directly impacted nearly 56,000 Louisiana students through the Seeding Louisiana initiative alone. Seeding Louisiana began as a promotional campaign funded by a 2019 USDA Farm to School grant. Promotional seed packets were distributed to over 1,600 Louisiana schools, and over 1,000 seed starter kits were distributed to teachers to expand farm to school programming in the classroom. In support of the physical materials, the Seeds to Success website provides unlimited access to growing guides and engaging lessons, all designed to integrate gardening into classroom and at-home learning. The website, [SEEDSTOSUCCESS.COM](https://seedstosuccess.com), houses targeted information on how to grow fruits and vegetables in Louisiana at your school or home, how to apply those skills into learning, and then how to turn those interests into a budding career. Additional materials on the website include Louisiana Harvest of the Month, recipes, tips for purchasing locally and a wealth of resources to support local food and farm to school efforts.

Training and technical assistance are integral to Seeds to Success. The

pandemic forced many school nutrition directors to reassess where their food is coming from and how to better source the ingredients they need locally. The Seeds to Success team is constantly working to connect producers with each other, community partners and potential buyers through farmer marketing training, local procurement technical assistance, and marketing materials to educate stakeholders.

To further enhance programs like Seeding Louisiana, summer workshops like the School Garden Leadership series offer over 20 hours of hands-on gardening and educational sessions for classroom teachers. The Seeds to Success: Louisiana Farm to School Program, developed and managed by the LSU AgCenter, is the only statewide comprehensive program supporting farm to school and the three pillars of farm to school.

Crystal Besse is the program director for Seeds to Success: The Farm to School Program, and Celeste Finney is the manager of school nutrition and procurement for the program.

CELEBRATING FRESH FLAVORS *OF* LOUISIANA FARMS

■ CELESTE FINNEY AND CRYSTAL BESSE

If the phrase, “**HI FRIENDS, I’M CRYSTAL BESSE!**” sounds familiar to you, then you have probably seen one of many Louisiana Harvest of the Month videos currently produced by Louisiana Public Broadcasting (LPB) and Seeds to Success: The Louisiana Farm to School Program. In 2015, Harvest of the Month began as a pilot project in three Louisiana schools. The purpose of the initiative was to introduce local produce to students by incorporating Louisiana-grown fruits and vegetables into the school menus on a monthly basis.

Louisiana HARVEST *of the* MONTH

Harvest of the Month tastings in the cafeterias were supported with educational materials and “I tried it!” stickers. From this pilot project, a robust educational and Louisiana Harvest of the Month marketing campaign has grown. Twenty Louisiana-grown items ranging from blueberries to shrimp have all been featured, each boasting a portfolio that includes a Harvest of the Month poster, recipes, lesson plans and sustainable planting guides.

Any educator, parent or school child nutrition professional can sign up for the Louisiana Harvest of the Month program by visiting the Louisiana Farm to School Program website, **SEEDSTOSUCCESS.COM**. Participants of the Harvest of the Month program receive access to the online suite of resources and a supply kit with a Harvest of the Month guide, posters, “I tried it!” stickers, a seasonality chart and other educational materials.

The Harvest of the Month program is completely customizable to suit a classroom’s needs and can be scaled up for widespread use at a district level. Teachers or child nutrition professionals can choose a Harvest of the Month item to feature and use supporting materials provided through either the supply kit they receive or by accessing the website. The Harvest of the Month Getting Started Guide walks new participants through the process of how to create an educational movement centered around seasonal and local foods. Participants will find that seedstosuccess.com provides an

organized system of resources catalogued by each Harvest of the Month. For each Harvest of the Month crop, participants will find comprehensive gardening guides, activity and coloring sheets, social media images, menu templates, recipes and cooking tutorial videos. The Seeds to Know section of the website allows teachers to scroll lesson plans organized by grade level and crop that have all been vetted by Louisiana teachers and matched to Louisiana state curriculum standards.

While the Harvest of the Month collection contains many resources, by far one of the popular components is the Harvest of the Month video series. To date, the Seeds to Success team has created 14 Harvest of the Month videos through a collaboration with LPB. Each Harvest of the Month video takes viewers to a Louisiana farm to meet a producer, shows how the item is grown and harvested and brings everyone into the kitchen to watch a recipe demonstration by Judy Myhand, LSU senior nutrition instructor. The segments are typically about 10 minutes long, making them a perfect classroom resource. The Seeds to Success team and LPB plan to continue their partnership by creating more videos as the Harvest of the Month campaign continues to expand. Videos are released at the beginning of each month on the Louisiana Farm to School Program and Louisiana Public Broadcasting Facebook pages.

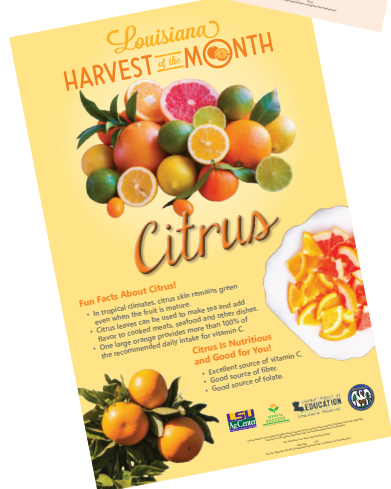
Celeste Finney is the manager of school nutrition and procurement for Seeds to Success: The Farm to School Program, and Crystal Besse is the program director.



LSU nutrition instructor Judy Myhand speaks with a citrus producer about Meyer lemons during a Harvest of the Month video on citrus. Photo courtesy of Louisiana Public Broadcasting



Allison Guidroz of Fullness Farms and Crystal Besse of the Louisiana Farm to School program demonstrate how to successfully grow and harvest different varieties of beet greens in a Harvest of the Month video. Photo courtesy of Louisiana Public Broadcasting



TWO STUDENTS TRY SWEET POTATOES AS PART OF HARVEST OF THE MONTH TASTINGS IN LAFAYETTE PARISH.

Photo by Allison Richard



SEEDS TO SUCCESS SPOTLIGHT: ARMSTRONG FARMS

■ TYNE BANKESTER

A major goal of the Louisiana Farm to School Act is to promote the use of locally grown and raised foods in school nutrition programs. One avenue to achieve this is for school food service personnel to source ingredients for school cafeteria meals within the state. In doing this, school districts directly support their local economies and community members who grow these products.

In recent years, school districts have shown interest in procurement of Louisiana-grown commodities, such as sweet potatoes, rice, satsumas, lettuce, greens, seafood and tomatoes. It is important that Louisiana residents recognize and celebrate the producers who are doing the work to provide the children of this state with nutritious meals throughout the school year. Armstrong Farms is just one example of a community grower selling their products to Louisiana schools.

Armstrong Farms is a third-generation farming operation in Bastrop led by 34-year-old Ashley and her 78-year-old father, Harper. Their motto, “We are each other’s harvest,” drives

them to serve their community in several ways. This farming duo actively sells their harvest at several farmers markets within northeast Louisiana. Beyond traveling to meet these customers and provide healthy produce in food deserts, the Armstrongs also provide opportunities for customers to pick their own greens.

The Armstrongs grow 100 acres of vegetables that they sell locally in addition to nearly 1,000 acres of commercial row crops, including soybeans, wheat and cotton.

“I’ve been farming all my life,” Harper said. “We always grew enough food to take care of the family, and that’s been my purpose. We always sell food to other people at the same time.”

Understanding the importance of connecting students to where their food comes from, Armstrong Farms has also expanded to sell their produce to schools in their area. When asked how this connection was established, Ashley said, “Dad spoke with someone who he knew on the school board and that got the ball rolling.” Over the years, they have sold



a variety of produce to local schools: watermelon, purple hull peas, butter beans and even sweet corn.

“We’re actually selling to Morehouse and Ouachita parish schools this year!” said Ashley, showcasing how their partnerships with school districts have expanded over recent years.

The Farm to School Program is committed to helping producers connect to school districts much like Armstrong Farms. When local produce is purchased and served to children in the community, everyone benefits

Tyne Bankester is the program manager for curriculum integration and MarketMaker for Seeds to Success: The Louisiana Farm to School Program.

Vegetables grow in a field at the Armstrong Farms fields near Bastrop. The Armstrongs plant around 100 acres of produce and supply schools in the area with vegetables.
Photo by Kyle Peveto

Harper and Ashley Armstrong show off their vegetables in the field at their farm near Bastrop. Photo by Kyle Peveto



THE ECONOMIC BENEFIT TO LOUISIANA WHEN SCHOOLS PURCHASE LOCAL FOODS

■ WHITNEY MCKINZIE, MARIA BAMPASIDOU, CRYSTAL BESSE AND CELESTE FINNEY

Each school day in the United States, approximately 29.6 million children eat lunch at school. The food necessary to prepare these meals on a daily basis makes K-12 sales a unique opportunity for farmers and ranchers to service their local institutions. This venture into local food systems is part of a nationwide farm to school movement.

Farm to school involves three pillars: education, school gardening and local procurement. Students benefit from farm to school activities by gaining familiarity with local production, increased consumption of fresh fruits and vegetables and improving their understanding of local agriculture. The U.S. Department of Agriculture (USDA) conducts an annual voluntary Farm to School Census among school food authorities who operate federal meal programs such as the National School Lunch Program.

In Louisiana, the 2018-19 census documented farm to school activities in

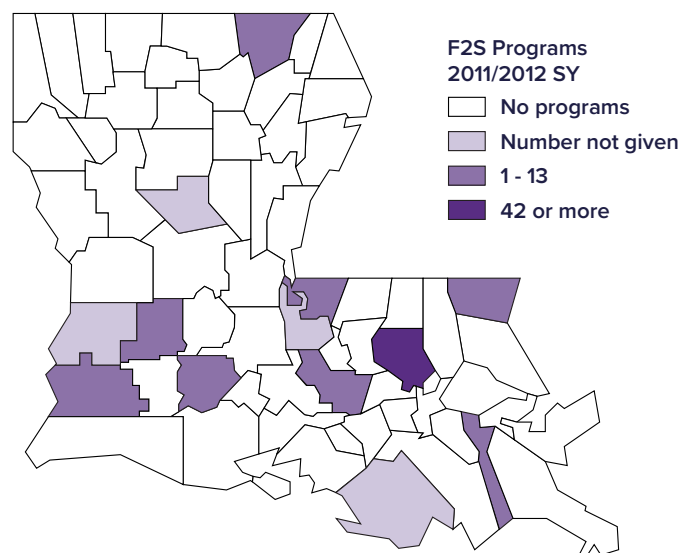
1,447 schools, reaching approximately 747,000 students. Eighty-five, or 55.6% of Louisiana school food authorities responded, and, of those, about 69.4% of the participating schools served local products in their cafeterias.

There is no dispute that purchasing local items and using local vendors can keep money in the regional economy. Seeds to Success: The Louisiana Farm to School Program teamed up with the LSU Department of Agricultural Economics to find the answer to the question, “What is the potential impact of dollars that are kept in the Louisiana economy through local purchasing practices?” IMPLAN software was used to develop an input-output analysis framework to measure Louisiana school districts’ economic impact from purchasing local foods. Six Louisiana district-level child nutrition programs’ requests for proposals and bid tabulations were analyzed for the 2019-20 school year, representing

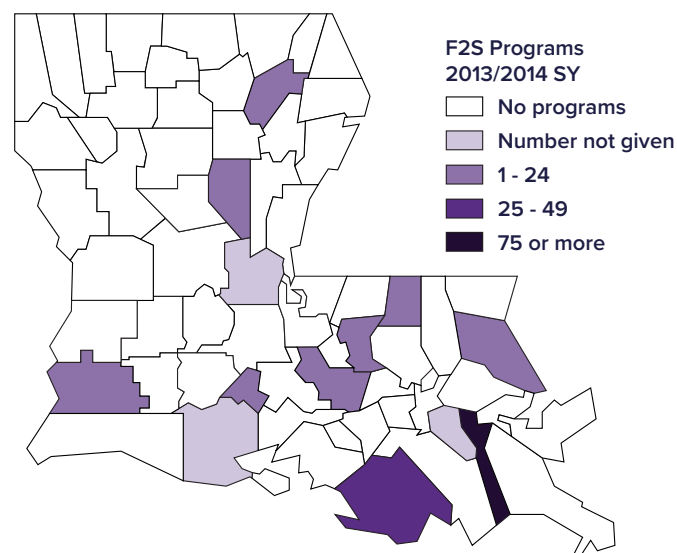
typical purchasing practices prior to the COVID-19 pandemic. Child nutrition directors were asked about their interest in purchasing local food while exploring the substitution effect of several local cultivars and Louisiana items that could be added to their menu cycle. For example, if a school district has oranges on its menu and decides to purchase a local variety of citrus instead, what is the potential economic impact of this line-item switch? The local items used in this study as potential menu alternatives included strawberries, rice, sweet potatoes, smoked sausage, oranges, Cajun seasoning, cabbage and lettuce.

The school districts interviewed were from different metropolitan areas in Louisiana; each district served 30,000 to 45,000 students per day and spent approximately \$4 to \$6 million on its annual primary food expenditure budget. Details from the child nutrition director interviews were analyzed

2011/2012 SY



2013/2014 SY



for potential substitution effects for local items in established quantities of food already being purchased for their respective districts' menus. This information was instrumental in understanding the procurement process and local procurement practices within each school district. The interviews revealed challenges faced by public school districts in procurement of food items, including dietary or nutritional value, budget constraints, kitchen equipment and processing challenges, food safety compliance and year-round availability of products.

USDA Farm to School Census data was also analyzed to identify major barriers that would potentially prevent schools in Louisiana from participating in farm to school activities. Data from the 2013, 2015 and 2019 USDA Farm to School censuses were used for the purpose of her study and mirrored the information provided in the child nutri-

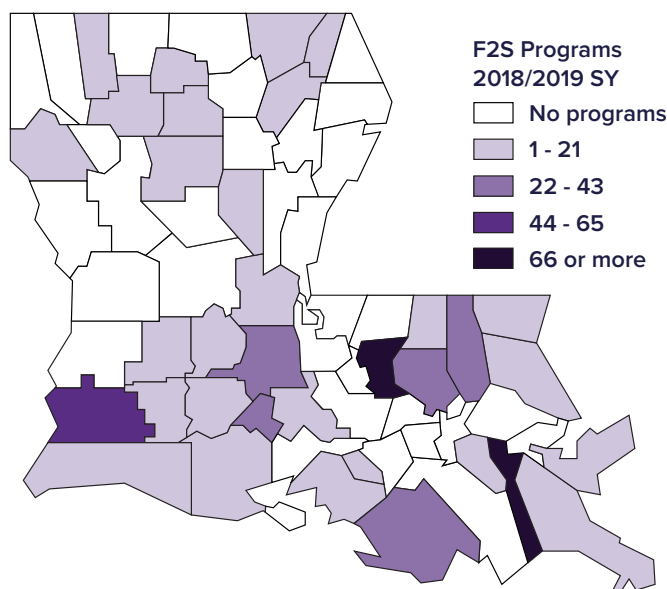
tion director interviews. Through careful analysis and calculation of self-reported census data, significant differences were found in farm to school participation in schools that reported staffing issues and school district issues. Staffing issues at the school level, including a lack of staff and time to prepare local foods, were correlated with a 40% decrease in farm to school activities. School district issues, such as difficulty in coordinating local purchasing with regular procurement, were tied to a 48% decrease in farm to school participation.

Although there are barriers to purchasing local items as identified by child nutrition directors, the effort to shift line-item purchases within a geographical preference can have a positive effect on the Louisiana economy. The analysis indicated that for every dollar spent on local food purchases, an additional 26 cents to 48 cents of output can be generated in economic benefits. This

theoretical monetary gain would then be spread across different Louisiana industries that would include agriculture as well as transportation and other ancillary fields. The analysis was definitive, showing that there was a positive economic impact of substituting available local items on Louisiana school menus. This study also reveals that the economic impact of institutionalized local purchases is worthwhile and further analyses could prove advantageous for Louisiana's bottom line.

Whitney McKinzie was a graduate assistant in the Department of Agricultural Economics and Agribusiness and graduated in August 2022. Maria Bampasidou is an assistant professor in the department. Crystal Besse is the Seeds for Success: The Louisiana Farm to School Program director, and Celeste Finney is the manager of school nutrition and procurement for the program.

2018/2019 SY



DESPITE BARRIERS TO PURCHASING LOCAL FOODS, FARM TO SCHOOL PARTICIPATION SAW A SIGNIFICANT INCREASE SINCE THE LOUISIANA FARM TO SCHOOL PROGRAM WAS ESTABLISHED IN 2016.

Graphic by Whitney McKinzie

Source: 2013, 2015 and 2019 U.S. Department of Agriculture Farm to School censuses

farmtoschoolcensus.fns.usda.gov

SEEDS TO SUCCESS SPOTLIGHT: LEADERSHIP WORKSHOPS

■ JACEY WESLEY

In 2018, the Seeds to Success Program held its inaugural School Garden Leadership Workshop. The workshop takes place each summer over several days and consists of hands-on learning and lectures to help educators learn how to build and sustain a school garden while incorporating farm to school programming into their curriculum.

In 2022, the fourth-annual training was held from June 20-23, at the LSU AgCenter's Hill Farm Teaching Facility in Baton Rouge. Thirty-eight teachers registered for the workshop, 26 of which completed the attendance and participation requirements. Participating teachers completed 24 hours of educational sessions during the four-day workshop.

Topics covered included crop basics, composting and fertility management, raised bed construction and how to incorporate the garden into school curriculum.

Hosting the workshop at the Hill Farm Teaching Facility allowed the participants to view fruit, vegetable and herb crops in an actual garden setting.

School garden integration in the classroom was covered for several subjects, including art, reading, science, engineering, history and social studies, math, agriculture, health, physical education and nutrition.

Each participant went home with resources from the Seeds to Success team, including a set of Harvest of the Month posters, a seasonality chart, a container garden growing system, a window-sill greenhouse kit, seeds and many other resources exclusively offered to training participants.

The reviews of the training from previous participants have been overwhelmingly positive; the team received a lot of supportive feedback including: "Very informative and supportive. I learned so much and feel more confident about teaching gardening," and "I enjoyed being able to learn how to practically incorporate gardening at school. Everything we learned seemed like something we can do at school. Well done!"

In 2023, the Seeds to Success team will be providing two School Garden Leadership Workshops in Baton Rouge and in Alexandria in order to reach more educators from across the state.

If you know someone that would benefit from this opportunity for professional development, please email LOUISIANAFARMTOSCHOOL@AGCENTER.LSU.EDU.

Jacey Wesley is the communications director for Seeds for Success: The Louisiana Farm to School Program.

Educators from across the state work together to learn the basics of creating and sustaining compost piles at LSU AgCenter's Hill Farm Teaching Facility in Baton Rouge during the 2022 School Garden Leadership Workshop. Photo by Carl Motsenbocker





DENYSE CUMMINS, AN LSU AGCENTER EXTENSION HORTICULTURIST, WALKS PARTICIPANTS THROUGH SETUP AND MAINTENANCE OF CONTAINER GROWING KITS AT LSU AGCENTER HILL FARM TEACHING FACILITY IN BATON ROUGE DURING THE 2022 SCHOOL GARDEN LEADERSHIP WORKSHOP.

Photo by Carl Motsenbocker

EXPANDING PRODUCER MARKETS: A RELATIONSHIP FOR SUCCESS

■ CRYSTAL BESSE, CARL MOTSENBOCKER AND PAMELA HODSON

Farm to school in Louisiana has grown by leaps and bounds with nearly 53% of school districts offering some type of farm to school programming to more than 505,000 students, according to the U.S. Department of Agriculture Farm to School Census. Additionally, 69% of participating districts are serving local foods.

This growth did not happen on its own, however. Support from the state and federal government and nonprofit organizations has been key to the development and expansion of Seeds to Success: The Louisiana Farm to School Program, with the passing of the Louisiana Farm to School Program Act in 2016. One such example, **LOUISIANA MARKETMAKER**, has been forging local purchasing initiatives in partnership with LSU AgCenter since 2010. The program that began as a means to help Louisiana Gulf Coast seafood producers is now utilized to access the most extensive collection of Louisiana-based food producers and distributors. Louisiana MarketMaker is directly managed by Seeds to Success, and the farm to school program promotes its use as the primary means for schools to locate local farms and producers.

This powerful partnership connects food producers, distributors and suppliers to consumers and proved especially beneficial in recent years due to weaknesses in conventional long-distance supply chains, exacerbated by the coronavirus pandemic. According to the USDA Food and Nutrition Services, supply chain disruptions have posed many challenges for child nutrition directors and purchasing agents since 2020. These challenges, including limited product availability, orders arriving with missing or substituted items, and labor shortages, are just a few of the many barriers cited to delivering healthy and nutritious meals to students. The COVID-19 pandemic forced many to reassess where their food comes from and how to better source the ingredients they need locally to shorten the supply chain. There has been a notable increase in school districts requesting assistance to identify local producers in their communities and throughout the state to help close these gaps for a more resilient food system.

A main goal of the Seeds to Success team has always been to connect producers with potential buyers, community partners and each other, be it digitally or physically. Louisiana MarketMaker became the premier digital database and partner of Seeds to Success to connect farmers and fishermen with school districts looking for local food. It provides simple yet powerful search tools to connect with others across the production and food distribution chain. Exclusively relying on

digital meetings, however, is rarely sufficient, so the Seeds to Success team developed a networking event series to encourage a clear and direct exchange of information between agricultural producers, fishers and commercial buyers. Named after its purpose, these Meet the Buyer networking events bring commercial aggregators, school districts, grocers and other greater-capacity buyers to the farms and fields of those registered on Louisiana MarketMaker and allow for a more detailed discussion beyond simple price and quantity negotiations. Other in-person events, such as the annual Louisiana Farm to School Conference, provide farmers, community partners, school personnel and child nutrition directors a chance to meet and connect on what their needs are and discover previously unknown small or minority-owned farms and operations.

According to the co-founder of the National Food Market-Maker Program, Darlene Knipe, "Louisiana Farm to School is a marquee program that MarketMaker looks to as the model

**TYNE BANKESTER,
RIGHT, DISCUSSES THE
SEARCH FEATURES OF THE
LOUISIANA MARKETMAKER
WEBSITE AT THE 2022
LOUISIANA FARM TO
SCHOOL GATHERING.**

Photo by Carl Motsenbocker

for other partner states to follow and has earned three Farm Credit Innovation awards to show for it. We are thrilled to be working with this team. They lead by example.”

Louisiana agribusinesses, such as food producers and distributors, can register and set up a MarketMaker profile for free, which allows the user to enter their own business information, appear in search results for markets and post product needs and availability. The platform is freely available for the public to use in their search for fresh farm products and agritourism venues. Simple search features help to facilitate connections along the food supply chain, from farm input suppliers to wholesalers, from pumpkin patches to public institutions, and allow agribusinesses to indicate affiliations such as Certified Louisiana, Certified Cajun and Southern Shrimp Alliance to name a few.

Through these efforts, several small- to mid-size producers have successfully established relationships with local schools. From cantaloupes and watermelon to smoked sausage and

sweet potatoes, local is on the plate. The Seeds to Success team continuously offers procurement training and technical assistance; the MarketReady program and the Bringing the Farm to School training for farmers includes best practices on farmer readiness for selling products to schools.

In all situations, the connections that the Seeds to Success team facilitates ultimately improves the health and well-being of Louisiana citizens on multiple fronts. Through the program’s community partnerships, education and outreach, students gain access to healthy, local foods and producers are expanding their markets while school nutrition directors are closing supply chain gaps.

Crystal Besse is the program director of Seeds to Success: The Louisiana Farm to School Program. Carl Motsenbocker is the program’s executive director and a professor in the School of Plant, Environmental and Soil Sciences; and Pamela Hodson is a program adviser.



SEEDS TO SUCCESS EXTENSION SPOTLIGHT: JESSICA RANDAZZO

■ CRYSTAL BESSE

The pandemic may have slowed down school garden production in St. Mary Parish, but extension agent Jessica Randazzo is full steam ahead, helping get the gardens back into full operation.

“We’ve been working on building back our garden to what it once was before COVID. Jessica has been tremendous. She is always looking for new experiences and resources for our garden club,” said principal Shantell Toups, of J.S. Aucoin Elementary in Amelia, Louisiana.

Randazzo serves as the area nutrition agent for St. Mary Parish and is leading a successful example of farm to school work in action using garden-based nutrition education. Teachers who participate in Supplemental Nutrition Assistance Program Education (SNAP-Ed) programming are offered activities ranging from novice to advanced including seed germination, preparing recipes using fresh fruits and vegetables or installing a raised bed garden. Food-based gardening is a beneficial activity that leads to the economical production and consumption of healthy and fresh foods. SNAP-Ed providers promote the value of gardening for nutrition and play an instrumental role in improving access to healthy foods by supporting community and school gardens in limited-resource communities.

“I’ve been able to combine the strategies offered through the Smarter Lunchroom Movement with samplings of local products featured in Louisiana Harvest of the Month to increase consumption of fruits and vegetables,” Randazzo said. “Students tried all the produce they grew during the cooking demonstration portion of our lessons. In some instances, the school garden produced enough to include garden-grown vegetables on the school lunch menu. The school principal signed up for the Harvest of the Month program and received posters and ‘I tried it’ stickers. Having the Harvest of the Month posters up reinforced the topics taught during the lessons. From the looks on the students’ faces, it was evident that they were proud of themselves for producing and trying new foods.”

SNAP-Ed supports food related gardening by allowing purchases of seeds, plants, small gardening tools and soil. For more information and resources about LSU AgCenter SNAP-Ed nutrition education and gardening, visit WWW.LSUAGCENTER.COM/SNAPed.

Crystal Besse is the program director of Seeds to Success: The Louisiana Farm to School Program.

Jessica Randazzo, St. Mary Parish extension agent, prepares pan-fried cauliflower that was grown and prepared by the J.S. Aucoin School Garden Club.
Photo by Bruce Schultz





ST. MARY PARISH EXTENSION AGENT JESSICA RANDAZZO POSES WITH RAISED GARDEN BEDS GROWING BRUSSELS SPROUTS, LETTUCE AND OTHER CROPS GROWN BY STUDENTS AT J.S. AUCOIN ELEMENTARY SCHOOL.

Photo by Bobbie Mitchell

SEEDS TO SUCCESS SPOTLIGHT: SHOWCASING MODEL PROGRAMS, DIVERSE SPEAKERS AT ANNUAL CONFERENCE

■ JACEY WESLEY, TYNE BANKESTER AND PAMELA HODSON

The Seeds to Success team coordinates the annual Louisiana Farm to School Conference and looks forward to providing a venue to exchange successes, farm to school information and networking opportunities each year.

Through the years, the Louisiana Farm to School Conference has extended the reach of farm to school programming statewide, facilitating opportunities to share success stories and to expand networks, leading to long-term growth in the movement.

The farm to school movement in Louisiana had its first meeting of practitioners in 2015 through a Farm to School Conference grant from the U.S. Department of Agriculture Community Food Programs. The grant provided funds for a statewide meeting in Baton Rouge and regional meetings in New Orleans and Alexandria.

The initial meetings provided a forum for the exchange of information on successful programs in the state, as well as networking both regionally and statewide. In 2017, an agreement with the Louisiana Department of Education was reached to fund support for a statewide farm to school initiative, and an annual gathering was established. In successive years, the meeting highlights have been the keynote address, success stories from around the state and networking. Throughout the years, the keynote has addressed all aspects of farm to school, featuring producer and

James Beard winner Ben Burkett, chef and restaurateur Dickie Brennan, and retired school nutrition director Beverly Girard.

The Farm to School Program sponsored a virtual conference in 2020 during the pandemic. The conference occurred in two-hour sessions for two consecutive weeks with 219 attendees from across the state. In addition, the virtual conference reached outside Louisiana with attendees from 20 other states and two countries (Bahamas and Haiti).

Sessions included farm to school during COVID-19, local success stories, garden sustainability, Louisiana food heritage and discovering your role in the food system. The conference also included the first ever Harvest of the Month taste tests with Louisiana sweet potatoes and broccoli.

One attendee said, “The taste test sessions were so much fun. I thought they were a great way to invite people into farm to school with something they could do at home and functioned as a lesson within itself.”

All sessions from 2020 were recorded and are available for viewing on the Louisiana Farm to School Program YouTube channel.

The most recent conference in 2022 brought together more than 200 attendees from 39 Louisiana parishes, including 28 local farmers and representatives

of various organizations and businesses.

Attendees included industry partners, state agencies, producers, school administrators, extension personnel and teachers. Topics discussed at the meeting included best practices on growing a farm to school program, connecting with students through agritourism and conducting classroom taste tests — all presented by farm to school champions found throughout Louisiana.

One attendee commented, “This was my first time attending the conference. It was an awesome experience, and I will utilize the information I gathered from this conference.”

In addition to breakout sessions and a keynote address, the gathering provided a venue for face-to-face networking between exhibitors and attendees. Exhibitors present at the 2022 conference included private businesses, state agencies, agricultural organizations, farms, nonprofits, commodity groups and volunteer organizations. They provided valuable educational resources to participants while gaining exposure and connecting with the farm to school community.

One exhibitor commented, “We were able to reach our intended audience and provided an outreach to people we otherwise wouldn't have been able to reach without the conference.”

The 2023 Louisiana Farm to School Conference will be Oct. 11 at Pennington Biomedical Research Center in Baton Rouge.

“THE TASTE TEST SESSIONS WERE SO MUCH FUN. I THOUGHT THEY WERE A GREAT WAY TO INVITE PEOPLE INTO FARM TO SCHOOL WITH SOMETHING THEY COULD DO AT HOME AND FUNCTIONED AS A LESSON WITHIN ITSELF.”

Jacey Wesley is the communications director for Seeds to Success: The Louisiana Farm to School Program. Tyne Bankester is the program manager for curriculum integration and Market Maker for the program. Pamela Hodson is a program adviser.



THE 2022 FARM TO SCHOOL GATHERING ATTENDEES PARTICIPATED IN A CHEER CELEBRATING THE LOUISIANA FARM TO SCHOOL MOVEMENT LED BY KEYNOTE SPEAKER BEVERLY GIRARD OF CULINARY SOLUTIONS CENTERS LLC.

Photo by Carl Motsenbocker



SCHOOL GARDENING WITH PURPOSE: SUPPORTING EDUCATORS WITH SEEDING LA

■ TYNE BAKESTER AND JACEY WESLEY

Establishing a farm to school program in this day and age seems like a daunting task at first glance. There are so many things to consider: How can I get administrative buy-in for my idea? Where will we put a garden? What will we grow? Who should we include to best support our program? How can I tie what's happening in the garden into my curriculum? Not knowing the answers can be a barrier for educators who want to integrate a farm to school initiative into their school programs. The uncertainties can stop them from even starting. Recognizing these challenges, the Seeds to Success team launched the Seeding LA project in 2019 as a promotional campaign funded by a U.S. Department of Agriculture Farm to School grant. Seeding LA has become a key component to answering those initial questions and supporting educators' farm to school programming.

Seeding LA is an extensive digital collection filled with fun, educational materials related to agriculture and nutrition. These resources are designed to be used by educators, parents and students, from the school garden to the home kitchen. Seeding LA consists of three branches:

- **SEEDS TO GROW** provides basic gardening information to help establish and run a successful garden including sustainable planting guides, gardening resource links and a beginner's growing guide.
- **SEEDS TO SOW** provides crop-specific growing guides to help take you from seed to harvest. Each growing guide details the history, seasonality information and plant varieties that grow best in Louisiana.
- **SEEDS TO KNOW** houses lessons and activities that can be used to bring the growing process to life for students either in the classroom or at home.

Striving to provide a variety of resources that can be enjoyed by the youngest and oldest of students, Seeding LA offers lesson ideas for pre-K to 12th grade. The lessons are grouped by grade level, focused on a specific type of Louisiana produce and aligned to Louisiana state curriculum standards. Other resources include book suggestions and video links to educate students not only on the crops themselves, but also the agricultural industry that makes their growth possible. Additionally, teachers can join a very active Seeds to Success Facebook group that allows them to share their successes and ask for advice when things might not be going how they expected. Through the Seeds to Success



Nurse Kacie Smith and students at Winnfield Primary School prepared for the spring growing season by setting up their container growing kit during the 2021-22 school year. Photo courtesy of Winnfield Primary School



Mia Whisonant, left, and Raelynn Walker, students from Winnfield Primary School, pick strawberries in their school garden. Photo by Kyle Peveto

website and Facebook group, the teachers' toolbox for implementing Farm to School programming is expansive and dynamic.

In addition to providing extensive digital support, Seeding LA has also funded several mailed resources to teachers. Since August 2021, Seeding LA has facilitated the distribution of more than 1,000 windowsill greenhouse kits, nearly 600 ready-to-grow container gardens and more than 5,000 seed packets to schools throughout the state. Windowsill greenhouse kits and seeds were also distributed in December 2022 to LSU AgCenter and Southern University Ag Center agents for use in extension outreach activities. In total, it is estimated that 55,908 students have been directly impacted by Seeding LA and that number continues to grow every day. While this extensive outreach is worth celebrating on its own, it is worth noting some of the specific impacts teachers across the state reported after their involvement with Seeding LA. Surveys show that 92% of teachers reported an increase in students' awareness of seasonality and local foods, and 88% reported an increase in students' interest in healthy eating. The feedback collected from teachers across the state strongly demonstrates the positive impact Seeding LA and Farm to School programming is having with youth.

While this quantitative data demonstrates the impact this program is having on schools, the anecdotal feedback received from teachers helps to paint an even clearer picture of the effects Seeding LA is having within school districts. Anna Barras, a nutrition educator from Vermilion Parish, perfectly summarized the sentiment many teachers shared about Seeding LA through their survey responses, writing "Kids are excited to learn about what they are eating and where it comes from, to try new and different things, and to learn about what grows right here in their own home state. The activities are fantastic, and the recipes are good. They love the videos and learn something new from them!"

When asked how Seeding LA has supported their farm to school initiatives, Kacie Smith, garden sponsor and school nurse of Winnfield Primary School, reported "Seeds to Know has really bridged the gap in connecting our school garden to the classroom curriculum." Smith shares the Seeds to Success website with the school staff each year and encourages teachers to use Seeds to Know to integrate the school garden into their curricula. This year the school's Garden Club was able to establish a school garden, and the third and fourth grade members are using the Seeds to Sow information to plan for spring plantings.

Just as gardens are amended from season to season, the Seeds to Success team is constantly curating new materials and updating the Seeding LA programming to ensure educators have access to the "freshest" resources possible, whether it is seeds, lessons plans or growing guides. The Seeds to Success team is excited to continue furthering the farm to school movement throughout Louisiana, using Seeding LA as a major support for the state's educators.

Tyne Bankester is the program manager for curriculum integration and MarketMaker for Seeds to Success: The Louisiana Farm to School Program, and Jacey Wesley is the communications director for the program.

ENCOURAGING SCHOOLCHILDREN TO EXPLORE NUTRITIOUS FOODS

■ KYLE PEVETO

In her hands-on college nutrition classes as well as cooking segments in monthly Harvest of the Month videos, Judy Myhand is an advocate for nutritious food.

She is known for gently encouraging the children and young adults she works with to explore the benefits of eating more fruits and vegetables.

"Try it. You just might like it," she tells them with a smile.

A nutrition instructor in the LSU College of Agriculture School of Nutri-

tion and Food Sciences and a part of the Seeds to Success team, Myhand has worked with children, teens and college students for decades.

Myhand answered a few questions recently about how farm to school programs can change the way children think about food.

WHAT ARE THE NUTRITIONAL NEEDS OF SCHOOLCHILDREN?

Children don't necessarily have radically different nutrition requirements than adults, except that they are growing. So, they do have a little more essentiality to ensure that they get the nutrients that they need for optimum health. Once a human is fully grown, it's still important for good health, but it's not as crucial as it is for that growing child.

They need to eat fruits, vegetables, whole grains, dairy and proteins, but what shouldn't they be eating? What is going to interfere with good health, metabolic processes and mental development? Not just mental but emotional development, the ability to handle stress and the ability to learn — are all impaired by a diet that's high in salt, saturated fat and added sugars.

HOW DO SCHOOLS TRY TO ENSURE CHILDREN HAVE ACCESS TO PROPER NUTRITION WHILE THEY ARE ON CAMPUS?

The National School Lunch Program and School Breakfast Program were created to offer foods that supply about two-thirds of the nutritional requirements for a growing child. It's important for schools to ensure that they're following the recommendations, which means serving lots of fruits and vegetables. The challenge they run into is that they might serve it, but it isn't necessarily eaten if the children have never been exposed to it. That plate waste is a problem, and school gardens can be part of the solution.

SO, HOW DO YOU INTRODUCE CHILDREN TO FRUITS AND VEGETABLES IN A POSITIVE WAY?

Research documented that children in a school garden program who were given an iPad to pick the foods that they wanted on their school tray were more likely to pick vegetables and fruit than children who didn't have a school garden



JUDY MYHAND IS A NUTRITION INSTRUCTOR IN THE LSU COLLEGE OF AGRICULTURE SCHOOL OF NUTRITION AND FOOD SCIENCES AND A PART OF THE SEEDS TO SUCCESS TEAM.

AgCenter file photo

program. Additional research determined that children who participated in a school garden program consumed up to three times as much fruits and vegetables as children who didn't participate in a school garden program and even ended up eating more of them at home. Participation in the school garden was correlated with increased consumption.

HOW DO SCHOOL GARDENS TEACH CHILDREN ABOUT NUTRITION?

The students go into the school garden every day. They see the tomato forming, and they get an almost an emotional attachment. Watching the vegetable grow and change, seeing the possibilities. It's just a cool thing, taking pride in what they've accomplished. A plant wilts. You water it, and it pops right back up. Then the teacher can say, just like that plant, "You need to drink more water."

Master Gardeners who participate in school gardens give sneaky nutrition lessons to the kids. It's not like there's a teacher standing there lecturing them about nutrition. It's just planting the idea, if you will, of the value of eating nutritious fruits and vegetables by comparing the growth of a seed into a plant that bears fruit. If it is fed the right nutrients, it stays healthy as compared to one that isn't. Then the students can connect that to their own nutrient needs and growth and development.

Kyle Peveto is editor of Louisiana Agriculture magazine.

A BOY SMILES WHILE SAMPLING STRAWBERRIES AT A HARVEST OF THE MONTH TASTE TEST AT THE KNOCK KNOCK MUSEUM IN BATON ROUGE IN 2019.

Photo by Olivia McClure



Two girls sample fresh strawberries during a Louisiana Farm to School event at the Knock Knock Museum in Baton Rouge in 2019. Photo by Olivia McClure



SEEDS TO SUCCESS TEACHER SPOTLIGHT: MELISSA STARKS

■ TYNE BANKESTER

In the four years since Melissa Starks began teaching in Winn Parish, she has seen a major impact from Seeds to Success: The Louisiana Farm to School Program.

Born and raised in Winnfield, Starks, a self-described “home-town girl,” works at Winnfield Primary School, teaching science and social studies to fourth graders. She has established her career educating the children of her community, describing her decision to teach in her hometown as a “no-brainer.”

“I love the people and culture here in rural Louisiana,” she said. “Everyone knows each other and there is always someone you can call for help. There are always local volunteers who are willing to help our school kids.”

When asked how Seeds to Success has impacted the farm to school activities of her school and students, she said that the program has taken their garden club to the next level with the Seeding LA materials.

“We enjoyed participating in the Louisiana Harvest of the Month program and thoroughly enjoyed the Great Louisiana Satsuma Peel as a school-wide activity,” she said.

Starks went on to say that the program has brought gardening awareness and exposure to many students who would not get this opportunity without it, and that spotlighting a harvest of the month makes it easy for her to squeeze in short lessons that expose students to more science-related items.

Teachers like Starks are integrating multiple facets of farm to school programming into students’ daily activities — from lesson plans to taste tests, to physically working the gardens and growing food — and the work is paying off.

Students are more knowledgeable about agriculture, have an appreciation of where their food comes from, are willing to try healthy foods that they previously avoided and are learning life skills that will help them live longer, healthier lives.

As one school year ends and a new one prepares to begin, the Seeds to Success team looks forward to seeing how the Farm to School program will help bring communities closer together by connecting students to their food.

Tyne Bankester is the program manager for curriculum integration and MarketMaker for Seeds to Success: The Louisiana Farm to School Program.

Melissa Starks, center, checks the Winnfield Primary School garden with students Raelynn Walker, left, and Parker Vines, right.
Photo by Kyle Peveto



**MELISSA STARKS, A FOURTH-GRADE
TEACHER AT WINNFIELD PRIMARY SCHOOL,
STARTED A GARDEN WITH HER STUDENTS.**

Photo by Kyle Peveto



STRATIFIED SUBSTRATES: A SYNERGISTIC SUBSTRATE SYSTEM TO IMPROVE RESOURCE-EFFICIENT CROP PRODUCTION

■ JEB S. FIELDS AND KRISTOPHER CRISCIONE

Over the past several decades, soilless culture, the practice of producing growing plants and crops in containers instead of in the field, has revolutionized global horticultural production practices through introducing new opportunities to produce crops in individual containers, offering growers complete control and increased resource use efficiency.

For the longest time, the nursery and ornamental industry relied on soilless culture, as the entire plant was the commodity, and the whole plant needed to be transplanted after sale. As time progressed, the production of many vegetable and small fruit crops began to transition to soilless culture for the increased control, particularly the enhanced environmental control that growing in a greenhouse provides.

However, throughout the globe we are witnessing a soilless substrate renaissance of sorts, where a variety of crops, ranging from the traditional ornamental and environmental plants to food crops encompassing vegetables, small fruit and large tree fruit are transitioning to soilless culture for the added benefits of precision control of environment, reduced disease pressure, more efficient resource use and indifference to arable soil.

Moreover, growers in some parts of the world are beginning to explore production of staple agricultural crops, like potato and soybean, in soilless culture systems. Not only do soilless systems allow for more control and efficiency in producing crops, they also remove the need for arable land from the equation. Thus, food can be produced near urban areas, mitigating food deserts and improving production sustainability, particularly with regards to timely transportation of harvested crops. In view of this transition, recent global modeling efforts have projected soilless substrate use and reliance to grow four-fold over the next 30 years.

While growing crops in soilless substrates can be more sustainable than field production, there are still limitations with soilless substrates, particularly with regards to source material sustainability. Substrate materials are often industrial byproducts like tree bark (from the lumber and paper industry), or natural resources like peat moss. Thus, cost and availability of these materials are subject to fluctuation.

From a production perspective, soilless substrate systems require more nuanced management practices, specifically surrounding water and nutrition conditions. Substrate systems were developed in a time where resource use and efficiency

may not have been prioritized in producers' minds. Substrates were developed to be forgiving, where excessive water and fertilizer applications would not necessarily induce the crop loss.

There have been limited efforts in reimagining the container-substrate system over the past 50 years. While the adage says, "if it isn't broke, don't fix it," failure to innovate will indeed pose challenges. As we move forward into a global economy that demands precision use of resources to improve crop productivity, a more synergistic substrate system may help support this rapid onset of new growers and provide insurance for resource limitations that may occur, all while ensuring the present and future success of the horticultural industry.

Substrate stratification is a relatively novel soilless substrate technique being developed within the Fields Lab in conjunction with U.S. Department of Agriculture Agricultural Research Service scientists; it involves stacking or layering unique substrate materials within a single container system. Layering substrates was initially developed to allow for precision fertilizer placement within the container system, allowing a more targeted fertility approach where nutrients are more available and accessible to growing crops. This then evolved to the ability to easily manipulate the air and water balance within the container, which is a container filled uniformly with a substrate. The stratified system is layering two substrates within.

Gravity dictates moisture distribution within the substrate, typically resulting in saturated media at the bottom of a container and drier conditions in the top of the container. This results in the need for very regular irrigation applications to maintain a moisture balance optimal for crop growth. However, incorporating fine or fibrous particles, materials which increase water holding capacity, within the top of the container can modify the hydraulics of a substrate. By using coarse materials below the fine particles of the surface, air-filled porosity is increased at the bottom of the container. In essence, water will "defy gravity" and result in a more uniform and balanced substrate moisture profile.

In typical substrates, bark is blended with fibers like peat, wood or coir to create industry standard substrates. The proportions can be adjusted to shift the air and water balance holistically (i.e., make the entirety of the system wetter or drier); however, stacking two unique substrates in a stratified

system can individually fine tune the moisture balance of the top or bottom of the container, allowing more control and more precision in applying water to specific regions of the container.

In stratified substrate systems, the finer particles in the top portion slow water infiltration rates. The slower water movement provides a more uniform wetting distribution, holding water where it is usually quickly depleted and needed by plants. The finer particles also help retain mineral nutrients where they are readily accessible to growing crops, rather than losing these crucial components to leaching. Larger particles in the lower portions increase pore space, gas diffusion and air storage, reducing the likelihood of the anerobic conditions that are often experienced by roots at the bottom of the container.

Stratified substrate research from our lab has indicated that water and fertilizer application rates can be decreased by 25% while maintaining or improving crop productivity and quality. Moreover, root growth has been shown to improve in stratified substrates, possibly due to quicker establishment and optimized rhizosphere conditions. The newest research findings in stratified substrates involve peat use.

We have identified that using stratified substrates where a peat-based substrate is layered atop a low-cost bark substrate not only cuts peat usage in half but may also provide increased drought resistance in tandem with the other previously described benefits of improved water and fertilizer efficiency and crop rooting. Financially incentivizing the use of this technology, peat substrates can be upwards of 10 times the cost of bark substrates. Replacing 50% of the container with cheaper materials without any sacrificing crop quality can provide substantial cost savings and increase profitability.

In summation, stratified substrates currently present numerous opportunities to help prepare for the surge of soilless substrate use in the coming decades and the demand to improve production sustainability with regards to resource use and efficiency. The added benefits in crop growth and root development are currently under investigation and may continue to provide added benefits to growers. This simplistic reimagining of the container substrate system has identified major benefits and improvements for growers, and we are just beginning to scratch the surface of this technology. As we move into the future, we must continue to evaluate and refine our traditional systems in order to explore new frontiers and opportunities.



A stratified substrate system should consist of finer substrate material layered atop coarse material as can be seen in this photo of a stratified nursery system utilizing pine bark grades to generate the layers. Photo by Jeb S. Fields



Low-cost pine bark can be layered below high-performance substrates to improve root productivity while reducing the need for costly peat-based substrates. Above is a representation of the variation in particle sizes that can occur in a stratified system. Photo by Jeb S. Fields

Jeb S. Fields is an assistant professor and extension specialist whose research lab focuses on environmental nursery production and soilless substrate science at the Hammond Research Station. Kristopher Criscione is a doctoral student working with Fields in soilless substrate science.

CONTAINER GROWN VEGETABLES FOR HOME GARDENERS

■ HEATHER KIRK-BALLARD, KATHRYN FONTENOT AND EDWARD BUSH

According to the 2022 Garden Trends Report from Garden Media group, home gardeners have a renewed interest in edible gardening with the highest growth in seed starting and container grown vegetables. The new gardener of today is interested in growing their own food in a sustainable way, and with shrinking lot sizes and larger home footprints, our urban gardeners are making use of less space. Home gardeners living in smaller areas do not have easy means of vegetable production. One solution for achieving optimal vegetable yields is by using a modified growing medium in container production of vegetables. The objective of this study was to determine if the Garden Greaux media developed by LSU AgCenter is a suitable medium for container production of certain fruits and vegetables compared to the control and industry standard mix.

In this study, three container mixes were evaluated for their use in the production of cucumbers, tomatoes and sweet potatoes. Those mixes were Old Castle topsoil, which served as the control, PRO-MIX as the industry standard and a potting soil developed by LSU known as Garden Greaux. All plants received irrigation daily to maintain substrate field capacity, which is the maximum amount of water a medium can hold. For the cucumbers and tomatoes, both the count and total harvested weight were doubled in the LSU substrate mix as compared to both PRO-MIX and Old Castle yields. The sweet potato count and total weight or yields were also greater when grown in the LSU potting soil. The sweet potato totals were three times the count and eight times the weight compared to PRO-MIX soil and greater than four times the count with eight times the weight when grown in Old Castle. In conclusion, the LSU packaged substrate outperformed the other two mixes and produced acceptable fruit quality.

MATERIALS AND METHODS

This experiment was conducted at the LSU AgCenter Hill Farm in Baton Rouge, Louisiana, on a nursery yard that simulated a homeowner's patio. The 7.5-gallon black plastic nursery containers were arranged in a randomized block design with drip irrigation which used Baton Rouge municipal water delivered by spray stakes. Each medium treatment and crop combination was replicated 10 times, and each planting was replicated over two planting dates, one year apart. The three media treatments used in this study were Garden Greaux, produced by Phillips Bark, Brookhaven, Mississippi; a commercially available bagged PRO-MIX, from Premier Tech Horticulture, Quakertown, Pennsylvania; and Old Castle topsoil, a Timberline product. The base mix of the Garden Greaux

media treatment in the study was 80% pine bark and 20% peat moss with incorporated slow-release fertilizer and lime to adjust pH and micronutrients. The combination of moss and bark provides good medium aeration, water holding capacity and cation exchange capacity.

The media treatments were evaluated to compare fruit and vegetable production of Dasher II cucumber, Sweetheart of the Patio tomato and Jewel sweet potato. Once flowering in tomatoes and cucumbers occurred, a weekly application of Miracle-Gro LiqueFeed All Purpose Plant Food Advanced (12-4-8) was applied for the duration of the study.

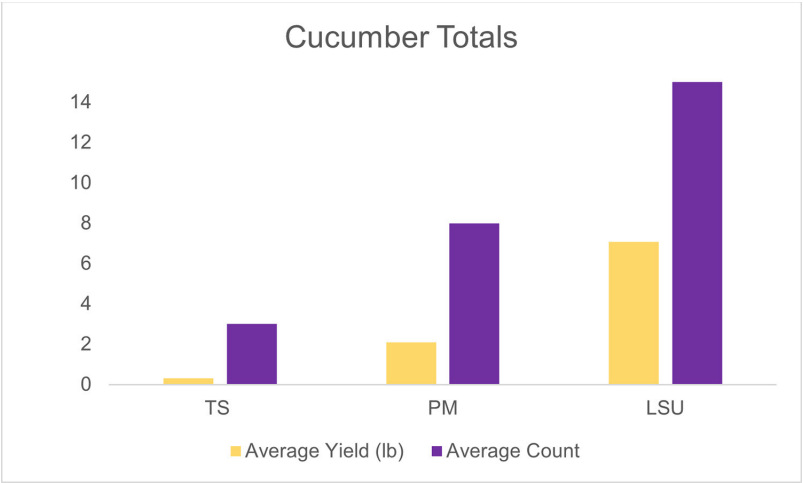
Pots were placed on 18-inch centers on the nursery yard and watered to saturate media before transplanting the vegetables. Transplants of cucumber and tomato crops were planted on May 1 in both 2020 and 2021 and harvesting began four weeks later. The study was terminated in August for both cucumbers and tomatoes when plants stopped producing. The sweet potatoes were planted on June 3 when slips were available and were harvested in September both years in 2020 and 2021.

Cucumbers and tomatoes were harvested once weekly. The number of fruits for each soil type was recorded along with harvest weights. Sweet potatoes were harvested upon completion of the study. The number of tuberous roots were recorded, and each was graded as either one, two, jumbo or culls. The individual weights also were recorded.

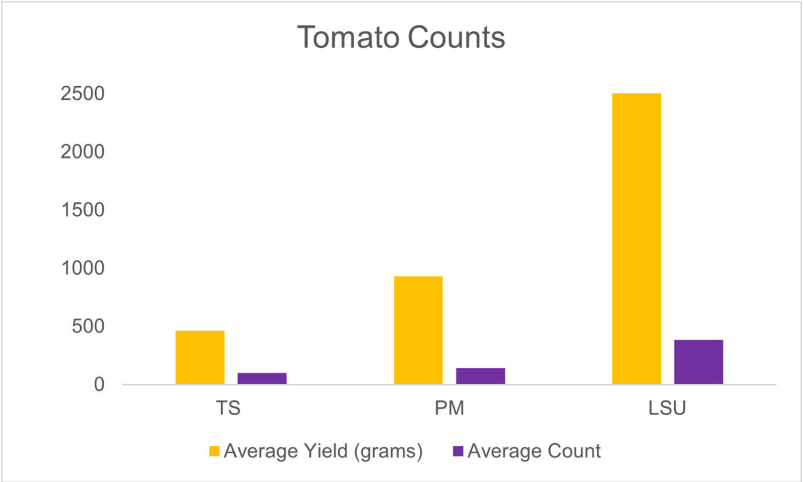
RESULTS AND CONCLUSIONS

LSU Garden Greaux outperformed the industry standard and topsoil control media treatments in all crops grown on the nursery yard. LSU branded soil is an excellent choice for vegetable production in containers for home gardeners. The combination of the mulch to moss ratio combined with micronutrients and lime offer a superior option for container substrates, and we recommend utilizing this mix for home vegetable production. The next steps will be to compare the LSU potting media with other commercially available mixes containing slow-release fertilizers.

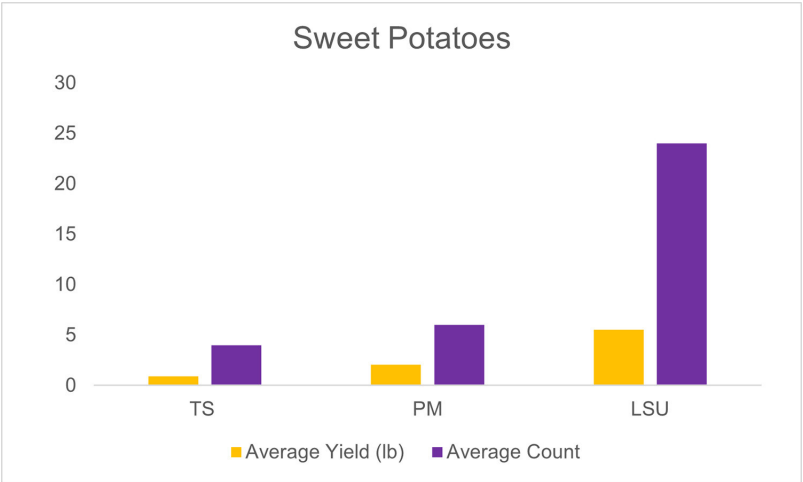
Heather Kirk-Ballard is an assistant professor, and Kathryn Fontenot is an associate professor for LSU AgCenter Extension. Edward Bush is an extension professor with LSU AgCenter Extension.



Graph 1. Average number count and average yield in pounds of Dasher II cucumbers harvested from container-grown plants with selected container mixes for two growing seasons.



Graph 2. Average number count and average yield in grams of tomatoes harvested from container-grown plants with selected container mixes for 12 weeks and repeated over two growing seasons.



Graph 3. Average number count of sweet potatoes and average weight in pounds of total harvested from container-grown plants with selected container mixes for 12 weeks over two growing seasons.

TS = top soil
PM = PRO-MIX
LSU = Louisiana State University

SEE INSIDE

Since 2016, Seeds to Success: The Louisiana Farm to School Program has educated schoolchildren about locally grown foods while connecting growers with school cafeterias.

SEE PAGE 10

Armstrong Farms in Bastrop is a third-generation farm that includes 100 acres of fruits and vegetables usually sold from a farm stand and at local markets. Now they are supplying produce to schools in the area.

SEE PAGE 14

Finding buyers for locally grown foods can be difficult. Louisiana MarketMaker, a website run by the Louisiana Farm to School Program, helps connect producers to schools and other markets.

SEE PAGE 20

Layering soilless materials in a container is a promising technique for growing crops. The LSU AgCenter Fields Lab is working with the U.S. Department of Agriculture to improve these soilless substrate systems.

SEE PAGE 32



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