

CFAES

SOUTH CENTERS

ACHIEVEMENTS 2022

CONNECTIONS

30

South Centers turns 30

OSU President Johnson visits Piketon

By **BRADFORD SHERMAN**

South Centers/CFAES

South Centers celebrated three decades of responsive research, education, entrepreneurial application, and collaborative partnerships in Southern Ohio with an impressive roster of honored guests as part of a special celebration event held in September 2021.

Ohio State University President Dr. Kristina Johnson headlined a list of speakers that also included Dr. Cathann Kress, Dean of the College of Food, Agricultural, and Environmental Sciences, and OSU Extension Director Jackie Wilkins. The goal of the event was to heighten the profile of The Ohio State University in this region of the state through interacting with an audience consisting of local stakeholders, legislators, organizational leaders, staff, and community members.

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A year of outreach, research,
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South Centers Director Dr. Tom Worley, right, formally welcomes President of The Ohio State University Dr. Kristina Johnson, left, and CFAES Dean Dr. Cathann Kress to South Centers in Piketon for the facility's 30-year anniversary celebration. (Bradford Sherman/CFAES)

30 YEARS from Front

Held primarily outdoors under a 1,600 square foot tent to comply with COVID protocols, the event also included a banquet catered by Mike Allering of All Seasons Catering, program updates, tours of the facilities, and a special presentation honoring four employees who have been at South Centers since it opened in 1991.

"We greatly enjoyed our guests, representing many partnerships with many organizations across the region and state, and especially appreciated the president of our university, as well as the dean of our college and associate deans being with us all at the same time," said South Centers Director Dr. Tom Worley.

"This was a great opportunity for all of our guests to learn more about the depth of our programs, as well as meet our excellent staff members who lead these programs."

During her speech, CFAES Dean Kress spoke about the 1,400 staff, 3,500 students, 47,000 animals, and 12,000 acres across 88 counties that help comprise the College of Food, Agricultural, and Environmental Sciences.

"We are one college across 3 campuses, with our faculty research, teaching, and Extension all dedicated to one single purpose – we sustain life," Kress said.

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Dr. Kristina Johnson, 16th President of The Ohio State University, delivers remarks during the South Centers 30-year anniversary celebration in September, 2021.

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Cover Story: **South Centers Turns 30**

The Ohio State University South Centers first opened its doors in November 1991. Three decades later, the facility marked its 30-year anniversary with a special event headlined by an appearance by the 16th President of OSU, Dr. Kristina Johnson.

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“CFAES is literally both the cornerstone college of our university and it is also the cornerstone of sustaining human life on Earth because of our disciplines. Today I am so happy to be here at the South Centers as we celebrate an important milestone for our college – 30 years of success, impact, innovation and partnership – living our land grant mission as an important part of our statewide campus.”

President Johnson expanded on the Dean’s message, calling South Centers a “perfect example of that cornerstone.”

“The Ohio State University South Centers is that perfect example of that cornerstone because of all the service to Ohioans that you do, using research to enhance the quality of life of Ohioans and equipping people with knowledge and skills they need to thrive and providing economic development tools and collaborative partnerships to our communities,” Johnson said.

“We solve problems – that is what Ohio State University has done for 150 years. Land grant universities like ours are uniquely positioned to solve the major challenges facing our society.

“I believe that with the help of CFAES, South Centers, Extension, and external partners – we can be that absolute model of what a 21st century land grant university is, and that is by committing to excellence in academics, research, entrepreneurship, partnerships, and most importantly, service.”

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ABOVE: Four employees who have been at The Ohio State University South Centers since it opened 30 years ago were recognized during the event and were presented with certificates and customized Buckeye football jerseys. From left are Dean Rapp, Marsha Amlin, and Wayne Lewis. **LEFT:** Duane Rigsby was unable to attend the celebration event.

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The event provided an ideal opportunity to recognize the longest serving members of the South Centers staff – Marsha Amlin, Wayne Lewis, Dean Rapp, and Duane Rigsby. Each were presented with an Ohio State football jersey with the number 30, along with their name printed across the back.

“At the heart of our center is a dynamic team of employees who demonstrate and develop leadership, facilitate technology advancement, educate and expand businesses, and help people to be the best that they can be while conveying an image of respect, helpfulness, responsiveness and the ability to assist in solving problems,” said Worley.

“This group of folks, they are the originals, they were here from the beginning. We wanted to make special recognition of all the contributions they have made over the many, many years.”

Among the others in attendance were several elected state and federal officials or their representatives, county commissioners, economic development professionals, OSU Extension leadership, college and university leadership, leadership from other nearby higher educational institutions; South Centers Liaison Committee members; local small business owners and partners; OSU South Centers Staff; and community leaders and members.

The Ohio State University South Centers enhance southern Ohio by assisting people with informed decision-making through responsive research, education, entrepreneurial application, and collaborative partnerships. We are a leading,



Attendees hopped aboard the wagons and took a tour of the South Centers research plots, research laboratories, and Endenvor Center.

respected contributor to the land grant mission of The Ohio State University.

Our research and extension programs are designed to promote, develop, and support innovative and profitable enterprises though integrating research and education. Agricultural Programs include: Aquaculture Research and Development; Commercial Horticultural and Specialty Crops; Soil, Water and Bioenergy Resources.

The Business Development Network offers innovative research, learning opportunities, technical assistance, and a network of resources for business owners and managers, entrepreneurs, youth, community leaders and educators, and elected officials. Business Programs include: Endeavor Center Business Incubator; Small Business Development Center; Manufacturing Extension Partnership; CFAES Center for Cooperatives; Direct Food and Agricultural Marketing.



Among the honored guests in attendance at the 30-year celebration include, from left, University of Rio Grande President Ryan Smith, Shawnee State University Jeff Bauer, CFAES Dean Cathann Kress, OSU Board of Trustees member Alan Stockmeister, OSU President Kristina Johnson, South Centers Director Tom Worley, and OSU Extension Director Jackie Wilkins.

Family FIRST

*Marsha Amlin retires after
30 years at South Centers*

By BRADFORD SHERMAN

South Centers/CFAES

Family comes first for Marsha Amlin.

It was that way on her first day with The Ohio State University way back on November 25, 1991. It remains that way through her final day on January 31, 2022, as Amlin retires after 30 years with the university at South Centers in Piketon.

"I'm ready to retire, but I feel like I probably would have hung on a little longer if I wasn't in the position I am in right now," said Amlin.

More important duties call now for Amlin, who is raising her two older granddaughters following the passing of her son, Chad, last year. Calling it a career now will allow her to spend more time with Harmony and Lilly as they enter their formative teenage years, and more time with her younger grandchildren as well.

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It is no surprise that Amlin would choose to put the needs and wellbeing of her family ahead of her own desires to continue working. She has put family first her entire life and encouraged her staff to do the same. Amlin explained that very early on in her working days, she had a supervisor who did not share the same values, and that experience helped shape her.

"I once had a supervisor who wasn't quite as understanding, and just didn't see things the way I saw them," Amlin recalled. "My family came first."

Amlin vowed to never be like that in the event she ever became a supervisor, which she did in 1996, when she began managing the South Centers support staff. One of her longest-serving staff members is Beth Rigsby, who has worked for, and alongside, Amlin for 16 years.

"Marsha's philosophy is all about faith, family, and friends. She treats everyone like family, and she took me under her wing," said Rigsby.



Amlin in 1991

"Whenever I needed to leave work at a moment's notice, she always said, 'go, don't worry about this place, I will be praying for you. Take care of your family.' Marsha really is the heart of the South Centers."

Amlin joined South Centers as a secretary in 1991 after holding similar positions at the Vern Riffe Vocational

School and a local sawmill. She was one of a group of around eight employees who helped start South Centers, and she still remembers how she felt walking through those doors for the first time.

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Amlin poses with then-President of the Ohio State University Gordon Gee



Amlin and Paul O'Bryant went all-out for Spirit Day.

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“As I walked into these doors on my first day, I’m thinking, ‘why did I come here?’ I felt like a duck out of water,” she said with a chuckle.

She can vividly remember the early days of South Centers when all official documents had to be prepared on triplicate paper using a typewriter, then sent to Columbus by U.S. postal mail. Thirty years later, those papers have been replaced by PDFs; typewriters displaced by computers; and snail mail outpaced by email, Microsoft Teams, and Workday.

Just like triplicate forms and typewriters, her uneasy feelings did not last.

“Thankfully, those feelings didn’t last for long. I got to know everyone, and soon started feeling like I was part of the family,” she said.

On that note, Amlin says what she will miss most about South Centers is its people. To her, family extends beyond her own flesh and blood – it also includes the many co-workers she has had the pleasure to work alongside for all these years. The feeling is mutual, especially from those like Dean Rapp, Duane Rigsby, and Wayne Lewis, who have all worked with her since day one.

“I started working here at the age of 21, just a kid,” said the now 52-year-old Rapp. “A great deal of that time, Marsha has been our work mother. Thank you, Mother, you will be greatly missed here!”

“Marsha is the one who you can go to for anything, whether its work related, or you just need someone to talk to about family matters. She is always there to listen and give advice, if need be,” added Duane Rigsby. “She is one everyone goes to for work-related questions, especially the ones that you don’t want to deal with.”

What Lewis will remember most about Amlin is that she always makes time for everyone, no matter how busy she is.

“Whenever you go into her office needing help, she will stop what she is doing and get it taken care of for you,” he said. “She can be up to her eyeballs in what she is doing, and she will take the time to help – and makes it look easy.”



Marsha Amlin has a warm heart, especially for babies. She is pictured above holding little Paige O'Bryant.

Amlin was never one who sought out attention or awards but did gain several accolades over the course of her career at South Centers. She was a two-time South Centers employee of the year award winner and also received the prestigious Buckeye Wellness Leadership Award in 2020 for supporting a culture of wellness.

As for Amlin’s post-retirement plans, she says she has no desire to travel the world like so many others do. She is a self-proclaimed homebody. She has a to-do list, however, raising a pair of teenage granddaughters means that may have to wait. One thing is for sure, she plans to still stay in touch with her “second family.”

“I’m not going to forget about this place. It has been a part of my life for too long to forget about it,” commented Amlin.

When asked about what she hopes everyone at South Centers will remember most about her, she said she hopes they remember that she worked hard and did her best at everything she was asked to do.

“Looking back, I hope that I gained respect from my co-workers. I hope they felt I was dependable, they could come to me whether it was something work-related or they just needed to talk,” she said. “I wasn’t just here to fill an office and do work – I could also be a friend who understands and listens, and could even cry with you, if needed.”

Just talk to those who know her best, and who have worked with her the longest – she undeniably has their respect. Duane Rigsby called Amlin a “rock-solid, steady person.”

“If there was ever a rock to lean on at the South Centers, it would be Marsha. She is a person that started in the front office doing the day-to-day office duties, but quickly became that person that really holds the entire office together,” said Duane Rigsby.

“She is the type of person who works in the shadows, working very hard and keeping things moving, but not doing it in a way that causes issues or makes a lot of noise, but you know things are done and done to the best that they can be.

“She cared for her staff, the employees she worked with, and I would go as far to say, she never considered them employees but more like family members.”

Whether it be her first family at home, or her second family at work, family always comes first for Marsha Amlin.

Back to the Basics

Modern communication methods miss important clientele like Amish and Mennonites communities

**By BRADFORD SHERMAN
and BRAD BERGEFURD**
South Centers/CFAES

Amish and Mennonite farmers overwhelmingly prefer face-to-face communication, as opposed to the modern methods commonly used by Extension personnel, a recent study has revealed.

Because more than 80 percent of Amish and Mennonite farmers have used or benefitted from Ohio State University Extension services, it is important to remember and respect their preferred communication methods, says Specialty Crops Specialist, and one of the authors of the study, Brad Bergefurd.

“As an Extension educator who has worked closely with Amish and Mennonite produce farmers for 20 years, I always remain cognizant of the communication methods I use in my Extension programming,” he said. “The results of this survey research confirmed the principles that I have been adhering to when providing unbiased research-based information to Amish and Mennonite produce farmers”



Extension Specialist Brad Bergefurd instructs a group of Mennonite farmers.

Data were collected through use of a mail survey questionnaire that was sent to all 345 Amish and Mennonite produce farmers who grew for Ohio produce auctions in 2011. The study achieved an overall 41% response rate with 138 surveys included in the final data analysis.

Bergefurd explained that Extension has increasingly adopted less personal, face-to-face types of teaching and learning methods. Due to budget and time constraints,

more communication with clientele is accomplished through email or online instruction.

However, survey results indicated that internet, websites, and webinars were not used by 97.7% of respondents, and 99.2% of the farmers indicated they have never used social media platforms like Facebook and Twitter or web-based content like blogs as information sources.

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“For Extension professionals or any organization that communicates and provides information to Anabaptist communities, it is important to recognize that these clientele prefer communication methods that may not be commonly used by the majority of their clientele,” added Bergefurd.

Face-to-face communication was reported to be the most-used method of communicating with other farmers within the community by 95.7% of respondents. Office visits and farm visits were used by respondents for sources of information 1-to-3 times per year by 32% and 55.4% of respondents, respectively, while 56.5% indicated they used field days and field demonstrations as sources of information 1-to-3 times per year.

Study results also indicated that Ohio Amish and Mennonite produce auction farmers obtain their farming information from a variety of sources. The top three sources of information used 10 or more times per year are university bulletins, newsletters, and newspaper and magazine articles. University bulletins such as the Ohio Vegetable Production Guide and the Midwest Small Fruit and Grape Spray Guide were used 10 or more times in an average year by 40.3% of respondents. Newsletters such as the Truck Patch News, OSU Vegnet, and the Ohio Fruit ICM newsletter were the second most popular source of information with 36.1% of respondents using this source 10 or more times per year.

Because resources such as Extension-produced newsletters and factsheets are popular with Amish and Mennonite communities, Bergefurd began making hard copies of these publications and distributed them to produce auction managers, who in turn made them available to these clientele.

Another hurdle for communication and contact with Amish and Mennonite produce farmers was the global health crisis that began in 2020. Extension programs nationwide relied heavily upon the use of online communication, as most Extension professionals received work-from-home orders from their universities and were not permitted to travel to individual farms and businesses.

“Alternative Extension programming and communication methods should be considered by Extension professionals to effectively communicate and assist Amish and Mennonite stakeholders when disruptions in traditional face-to-face teaching and programming occur, such as personal interaction restrictions of the 2020 pandemic,” Bergefurd concluded.

To read the full research study report, including full survey results, visit go.osu.edu/amishstudy.



Former Ag and Natural Resources Extension Educator for Pike County, Jeff Fisher, conducts an in-person training with Amish and Mennonite learners.

RESEARCHING THE EFFECTIVENESS OF LASER BIRD DETERRENT DEVICES

By **BRADFORD SHERMAN** and **DR. GARY GAO**

South Centers/CFAES

Bird depredation damage is a tremendous challenge for commercial fruit growers. Growers and researchers are constantly looking for easier and more cost-effective methods, including the use of lasers.

Small Fruit Specialist Dr. Gary Gao explained that many approaches have been tried over the years with varying degree of success, and now his Small Fruits team at The Ohio State University South Centers is investigating the use of these “laser scarecrows,” with some promising results thus far.

“Bird netting seems to be one method that is consistently reliable, but it is very costly and labor intensive to put up and take down,” he said. “A laser deterrent method that we are testing may provide some relief to growers.”

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***RIGHT:** One of the laser scarecrow units. **BELOW:** Dr. Gary Gao, Small Fruits Extension Specialist meets with Dr. Kent Eichenauer at Dragonfly Vineyard and Wine Cellar in Urbana, where one of the laser scarecrows were installed.*



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Gao spent much of 2021 researching the various, and plentiful, types of laser bird deterrent devices on the market. Such units can be as inexpensive as around \$100, or as much as \$25,000.

Following an extensive search and correspondence in conjunction with Dr. Rebecca Brown of the University of Rhode Island, Gao's team was able to purchase six laser units at cost. Three were installed at OSU research centers in Kingsville, Piketon, and Wooster, while the other three were placed in three commercial vineyards for observational trials in 2021 and 2022.

One such commercial vineyard was Dragonfly Vineyard and Wine Cellar in Urbana, where the laser scarecrow is connected to a solar panel, timer, and a deep cycle marine battery. Owners Connie and Dr. Kent Eichenauer have been pleased with the results.

"We feel so fortunate in our relationship with Ohio State for our viticulture and winemaking and appreciated the opportunity to experiment with the laser scarecrow in our vineyard," said Dr. Eichenauer.

"In our first and only season to try it, it worked phenomenally. We had coverage of two acres with the laser and had only about a dozen clusters affected. All that coverage with zero netting – this has been a huge timesaver. We are grateful to OSU and OGIC to be able to participate in this trial."

"The reason this deterrent method is so effective is because the laser mimics a predator's eye and frightens the birds," explained Research Assistant Ryan Slaughter. "The randomness of the oscillation means birds are unable to notice a pattern, which otherwise would render it useless."

Dr. Brown has also gotten some positive results on managing bird damage in sweet corn with a laser bird deterrent device developed by her project team. Gao indicated that she will likely apply for a USDA grant to continue her research on fruit crops.

"Hopefully, our field observations will help her grant application. More importantly, we hope the laser bird deterrent device will give our growers a more affordable and less labor consuming way to reduce bird damage," said Gao.

The laser scarecrow installed at South Centers in Piketon also produced some encouraging results, according to Gao, even though bird pressure was low at the center's demonstration vineyards in September and October 2021.

"After we saw a huge flock of doves in blueberry and fig plots, Ryan relocated our laser scarecrow there. Those doves just took off and moved away shortly after the laser scarecrow deployment there," recalled Gao.

Even though this is not replicated and randomized study, Dr. Gao is quite encouraged by the initial observation in 2021. He says he will continue this observational trial in 2022 and hopes to have more results to share.

Ohio Grape Industries Committee (OGIC) provided funding for the purchase of the laser scarecrows.



A University of Rhode Island Laser Scarecrow installed at Dragonfly Vineyard and Wine Cellar in Urbana, Ohio. (Ryan Slaughter/South Centers)

New produce auction coming to Beaver this year

COLUMN

Thirty years ago, I began my Extension career as the Horticulture Extension Agent for Geauga County. Geauga county is home to a large cheese plant and up until 1992, the county's Amish farmers produced grade-B milk for the cheese plant. In 1992, they were told that the cheese plant would no longer purchase grade B milk from the farms unless they converted their farms to grade A farms which would include the use of refrigeration and coolers in the milking parlors.



BRAD BERGEFURD

Assistant Professor and Specialty Crops Specialist



Ohio produce auctions generate an estimated \$30 million in sales annually providing 1000 farmers and buyers a market for locally grown produce. (Brad Bergefurd/South Centers)

Due to religious beliefs, the Amish farmers were unable to change their dairy operations, therefore the dairy farmers decided to change occupations, and many became produce growers. In addition to teaching a community of dairy farmers how to grow produce, I was also asked to assist with the planning and building of a wholesale produce auction to develop a wholesale market for their new produce acreage. This nearby, central to the farm produce auction was a first for Ohio.

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Farmers will receive in-field training on crop growing practices (Dr. Siddhartha Dasgupta/CSU)

New program to help train Ohio minority and socially disadvantaged farmers

By **BRAD BERGEFURD**, *The Ohio State University*
DR. SIDDHARTHA DASGUPTA, *Central State University*
and **DR. ALCINDA FOLCK**, *Central State University*

The lack of affordable and good quality farmland is a major barrier for many socially disadvantaged people to adopt farming as an occupation. For many minorities and socially disadvantaged farmers, to expand their farms and manage their cropland, they need to have educational opportunities to increase their farming knowledge and experiences.

Two grants, one for training new farmers and another for improving the farming practices of experienced farmers, will build viability of socially disadvantaged farms in Ohio by providing learning opportunities and training using outreach, technical assistance, and USDA programs.

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So, this fresh-out-of-college Extension Agent took on a big undertaking and assisted with the development and has continued for the past 30 years.

Produce auctions are local aggregation points that facilitate small-scale fruit, flower, and vegetable farmer access to wholesale buyers from a broader geography. They are generally shareholder-owned corporations that charge a commission to the farmer to conduct the mediated transaction. Produce auctions have historically been an important market channel for fruits and vegetables in Europe and North America. The first produce auction of this type was developed by Amish and Mennonite farmers in Lancaster County Pennsylvania in 1984 and is still operating today.

In-season produce auction sales are held multiple times per week to create a consistent supply for buyers and regular market for the farmers. Buyers purchase lots from multiple farmers to fulfill wholesale demand, and then re-wholesale or retail product. Buyers make payment to the auction, which issues a single weekly payment to farmers based on combined sales minus commission. The main emphasis is on the wholesale marketing principal rather than retail, though most auctions offer small retail lots.

For Ohio, the first Ohio auction began in 1992 in Middlefield. Farmers Produce Auction in Mount Hope was the second Ohio produce auction and was established in 1994. The first auction to be built south of I-70 was the Bainbridge Produce auction in Pike County and was built in 1999. In 2022, there will be 15 wholesale produce auctions in Ohio with the new auction facility in Beaver (Pike County). In 2021, an estimated 2,000 produce farmers and buyers marketed more than \$30 million dollars in locally grown produce through Ohio produce auctions, generating additional economic activity in these rural areas.

If you are interested in buying or selling produce at any of Ohio's five produce auctions or would like more information on the Ohio produce auction industry, contact Brad Bergefurd at bergefurd.1@osu.edu or southcenters.osu.edu/direct-marketing/produce-auctions.

Brad Bergefurd

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Brad Bergefurd of The Ohio State University South Centers is a collaborator with Central State University Extension, which is the lead University on this USDA National Institute of Food and Agriculture (NIFA) grant-funded project titled "Fastrack Farming: A training program for socially disadvantaged and military veteran beginning farmers during the COVID 19 pandemic" and the USDA Office of Partnership and Public Engagement's 2501 program grant titled "Building viability of socially disadvantaged farms in Ohio using outreach, technical assistance, and USDA programs."



Program participants will receive hands-on drip irrigation training (Brad Bergefurd/South Centers)

The goals of these projects are to train new and experienced socially disadvantaged beginning farmers with the knowledge and skills to start farming profitably by using workshops, incubator farms, mentors, and Extension outreach. Trainings will include farmland access, USDA farmer programs, plasticulture production, hydroponics, specialty crops, hemp, and beekeeping; marketing systems, food safety, farm safety, and farm/financial/risk management. It is anticipated that these newly trained beginning farmers will start farming, while the experienced beginning farmers will improve their current farm plans.

Bergefurd, a Specialty Crops Specialist, serves as the specialty crop mentor for the project. In this role he will provide technical assistance and hands-on education and training to the enrolled farmers on production, marketing, and crop management topics related to production of vegetables and small fruits such as strawberries. He will encourage farmers to network with each other and not operate in regional isolation. He will also share his specialty crop knowledge and provide direction for new farmers and youth participating in agricultural entrepreneurship in Cincinnati and Toledo.

For more information or how to become involved in this new minority and socially disadvantaged farmer training program contact Brad Bergefurd, leader of the South Centers Specialty Crops Program at bergefurd.1@osu.edu or Program Leader, Dr. Siddhartha Dasgupta, at sdasgupta@centralstate.edu, or Dr. Alcinda Folck at Afolck@centralstate.edu.



Highlights of the Fruit Extension Program and Research Projects

By **DR. GARY GAO**, *Professor and Small Fruits Specialist* and **RYAN SLAUGHTER**, *Research Assistant II*

Online workshops well attended in 2021

Due to COVID restrictions, the Small Fruits team at The Ohio State University South Centers continued to offer workshops online via Zoom in 2021. Zoom fatigue proved to be only a myth in regard to the small fruits workshops, as each continued to draw very nice numbers.

2021 Fruit Pruning School

The Online Fruit Pruning School, held in March 2021, was easily one of the most successful at South Centers the entire year. In total, 250 people registered to attend this event. Many people expressed interest in viewing the recorded version, but it still had a healthy number of live participants with a peak of 93 at one time.



Research Assistant Ryan Slaughter prunes some wine grape vines at South Centers in Piketon.

Most of the audience was retained throughout, with approximately 85 people still watching at around 45 minutes into the two-hour scheduled event, and the event ended with 67 attendees online once the two-plus hour event had ended.

The event was a mixture of pre-recorded video, PowerPoint presentations, live Q &A, interactive polls, and prize drawings every half hour. All these different formats helped keep people engaged throughout.

Fruit Production Series (March-April 2021)

The program's first-ever online Fruit Production Series, featuring two-hour-long individual sessions on blueberries, blackberries, and raspberries over the course of three weeks, was a rousing success with a total of 181 individuals registering to either watch the events live or on-demand later.

These events were held entirely online via Zoom, in keeping with the university's policies and procedures during the COVID-19 pandemic. All registrations were collected online via Qualtrics.



The 2021 Fruit Production online series was a nice success. (Dr. Gary Gao/OSU)

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The blueberry session held March 23 was the most popular event in terms of live viewership, but all three events averaged around 40-50 viewers for the live event. All the events also did a nice job of retaining viewers throughout the two-hour duration. For example, blueberries peaked at 50 viewers at one time and still had 43 people watching by the time the stream closed. Blackberries had a high of 40 viewers at one time, of which 21 remained at the end. Raspberries had peak live viewership also in the mid-40's and retained that number throughout.



The Fall Fruit Research Updates with Live Q&A in September 2021 was well received. (Dr. Gary Gao/OSU)

Fall Fruit Research Updates and Live Q&A II

The usual Blueberry, Bramble, and Grape Field Night in July or August was replaced with Fall Fruit Research Updates with Live Q&A delivered through Zoom in September 2021 due to COVID-19. Grape was one of the featured fruit crops at this program, and a few videos of South Centers vineyards and other fruit plantings were pre-recorded and aired during the event. Questions on a variety of fruit crops were also answered. The program drew 42 registrants.

These successful programs were certainly a team effort. Dr. Gary Gao and Ryan Slaughter were the featured presenters. Bradford Sherman handled program promotion and registration and prize drawings. Duane Rigsby and Sarah Swanson recorded and edited the videos for these training programs. Swanson also handled online polls.

Extension support to growers conferences

Dr. Gary Gao provided support to several grower conferences, including the OPGMA Produce Network, Ohio Grape and Wine Conference, and MidOhio Growers Conference. Dr. Gao and Ryan Slaughter co-presented a talk on cultivars, trellises, integrated pest management of various berry crops at the 2021 OPGMA Produce Network.

The 2021 Ohio Grape and Wine Conference was offered online. Dr. Gao served on the conference planning committee and provided input on topics, presenters, and helped with the logistics of the 2021 Virtual Ohio Grape and Wine Conference, which drew more than 300 attendees.

The 2022 Mid-Ohio Growers Conference in Mt. Hope, Ohio was a highlight of Dr. Gary Gao's year. This conference was organized by a group of Amish growers for the Amish community in Ohio and many neighboring states. Gao was invited to give two talks there, one on high tunnel raspberry production and one on commercial blackberry production. His raspberry talk drew about 150 people while his blackberry talk drew approximately 75 attendees. There were several thousand attendees at this conference. All the attendees were very eager to learn and asked many questions.

Extension support to county Extension offices and beyond

2021 Master Gardener Volunteer Training: Dr. Gary Gao was invited to provide training on tree fruits and small fruits to Master Gardener trainees for OSU Extension in Butler and Hamilton counties. The training program for Butler County was in-person and four hours long, while the training for Hamilton County was virtual and six hours long. Gao says the training programs were both very exciting to deliver and rewarding since these trainees will likely donate 50 hours of their volunteer service to their perspective Extension offices.

2021 Farm Science Review: Dr. Gary Gao and Ryan Slaughter were approached by Dr. Brooke Beam of OSU Extension in Highland County for recording a few videos to be shown at the iFarm Immersive Theatre at the 2021 Farm Science Review. The topic of our segment was the South Centers Specialty Crop Tour.

2020 and 2021 Ohio Vineyard Expansion Assistance Program (VEAP)

The Vineyard Expansion Assistance Program (VEAP) was offered by Ohio Grape Industries Committee in both 2020 and 2021. Dr. Gao evaluated grant applications, conducted pre-planting visits, and post-planting verifications. In spring and summer of 2021, Gao conducted post-planting verifications for the 2020 VEAP. In autumn of 2021, he reviewed grant applications and conducted pre-planting visits. This program helped add about 28 acres of grapes in 2021 and will help add another 28 acres in 2022. The total acreage may sound small, however, one acre of grapes can be converted into \$22,000 in Ohio wine. The total value of this program can be worth \$616,000 each year.

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Research and Extension Grants

Long Cane Raspberry Production: Dr. Gary Gao applied for a 2021 Specialty Crop Block Grant. He received funding for the project titled “Long Cane Raspberry Production System for Acreage Expansion, Farm Diversification, Risk Mitigation and Season Extension.” This will be a two-year project, and it officially began in November 2021.

What is the long cane raspberry production? Long cane raspberry production system is a relatively new raspberry production method where raspberry bushes with long floricanes (5 feet and 10 inches) are produced in greenhouses, stored in coolers in autumn and winter, and then shipped to growers in spring for planting and fruiting in summer. Growers can plant these “ready-made” plants with fruiting canes in a soilless media and a protected environment like a high tunnel or an unheated greenhouse or even under solar panels for fruit production in summer.

This new and innovative system could help growers get around the problems of poor soil drainage that limit new cane growth and fluctuating spring temperatures that damage floricanes. The long cane production has been very popular in Europe and Canada. This approach has



Long cane raspberry production could be an innovative way to grow raspberries in Ohio. (Gary Gao/OSU)

not been viable since there was not a nursery that grows and sells long cane raspberries. Recently, a nursery in Massachusetts started producing long cane raspberries.

It is exciting to note that the long fruiting canes have been shown to produce 2.5 to 4.0 kilograms (5.5 to 8.8 lbs) of large and tasty raspberries per cane under protected structures in Europe and Canada.

The mass production of long cane raspberry bushes in nurseries and mass plantings of long cane raspberries under protected structures could also present a unique opportunity for Ohio growers to expand raspberry acreage, mitigate environmental risks, and diversify their farming operations.

OGIC Extension Grant – Ohio Grape Industries Committee

Dr. Gary Gao and his grape Extension colleagues at OSU received another viticulture Extension grant from OGIC. With this grant, Gao and Ryan Slaughter can provide technical assistance to growers in southern Ohio. This will also provide much-needed funds to maintain demonstration vineyards for grape growers in southern Ohio and beyond. Currently, grapevines are planted in the

open field and under high tunnel with nearly 20 different grape cultivars with varying degrees of winter hardiness. These demonstration vineyards are integral to the Extension outreach of the grape program.

Slaughter hosted several vineyard tours at South Centers. One group had 52 farmers from Knox County. The bus tour was organized by OSU Extension and Soil and Water Conservation District in Knox County in August. Gao hosted a vineyard tour that was held during the 30-year celebration at South Centers in September 2021. Around 25 people toured the demonstration vineyards.

Research Proposals - USDA NIFA: Dr. Gary Gao was invited to join a multi-state and multi-million-dollar grant proposals in both 2021 and 2022.

Service to FAES, university, and association

University Senate - EOCA: Dr. Gary Gao has been serving as a university senator at OSU since September 2019. In 2021-2022, Dr. Gao chairs the Evaluation of Central Administration Committee (EOCA). The members of this committee evaluated two senior members of the university administration via interviews of 15 people for each member. Two final reports will be drafted, completed, and then presented to the OSU Faculty Council and the provost.

CFAES-IGP: Gao served on Intellectual Property Accelerator Panel of the College of Food, Agricultural, and Environmental Sciences (CFAES) Internal Grant Program (IGP) in 2022. He helped review proposals for this program and wrote a panel summary.

Ashtabula Grape Branch Visioning: Gao participated in the visioning process for the Ashtabula Agricultural Research Station. He provided suggestions on potential projects that deal with various specialty crops.

Northwest Berry Foundation: Gao was invited to review research proposals submitted to the Northwest Berry Foundation. This foundation gets proposals mainly from the pacific northwest states and awards millions each year.

National Vice Chair – Professional Excellence Committee of National Association of County Agricultural Extension Agents (NACAA): Gao finished his term as a national vice chair of the Professional Excellence Committee of NACAA. He oversaw judging of posters from the Northcentral Region and helped with the national judging for the Annual Meeting and Professional Improvement Conference of NACAA.

Extension support to colleagues in NJ, Virginia

Dr. Gary Gao was invited to give a talk on container fruit production for the 2021 Virginia Berry School and another talk on growing fruits in containers for Rutgers University's R U Ready to Garden program. Both programs drew excellent attendance. His presentations were based on the data collected at FAES South Centers from several specialty crop block grants.



New grant dollars to aid tomato soil health research, crop management

By **BRAD BERGEFURD, DR. YE XIA, DR. RATTAN LAL, and DR. RICHARD DICK**
The Ohio State University

New and emerging pathogens, nutrient disorders, and soil health issues have been reducing yield and quality for many Ohio tomato farmers. Thankfully, new three quarters of a million dollars in grant funding will aid researchers in finding answers.

New and emerging tomato production research will help farmers improve soil and plant health by integrating different agricultural practices and design a prescription Rx tomato fertility program for their specific tomato fields.

As of 2017, Ohio ranks 3rd in tomato production in the United States and has some of the largest processing and fresh market tomato acreage in the Midwest with 8,700 acres per USDA-NASS. A large percentage of this processing tomato acreage is organic which makes soil health that much more important to produce a high quality and profitable crop.

While the tomato industry is one of the important agriculture sectors contributing to Ohio's farm economy, some tomatoes are susceptible to diverse pathogens; and some tomato fields are susceptible and have been susceptible to flooding, drought and soil erosion, which lead to an associated decrease in soil health, tomato health and quality, and economic crop productivity. The effects of current farming practices together with climate change have affected soil and plant health which can impact the food and processing quality and production of tomatoes.

The Ohio State University South Centers in Piketon has been researching and refining tomato crop fertility and nutrition as well as disease controls for the past 20 years. Now, thanks to this new round of funding, applied research and demonstrative trials will be established beginning in the 2022 season to:

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1. collect unbiased research-based information on tomato and associated soil management techniques;
2. develop hands-on training programs including workshops and field days;
3. raise awareness of the correlation between soil and tomato plant health;
4. identify and utilize soil and tomato plant associated microbiome, and plant resilience through targeted surveys; and
5. showcase and provide tomato farmers unbiased research-based information on new soil and tomato management techniques.

The USDA National Institute of Food and Agriculture (NIFA) is providing grant support for this research.

To stay up to date on the progress of this tomato soil health project and to receive notifications when tomato field days, workshops, and programs will be conducted over the next three years, subscribe to the South Centers horticulture list serve at southcenters.osu.edu/horticulture/join-our-listserv/horticulture-listserv and follow on Facebook at facebook.com/OSUSouthCentersHorticulture.

For more information on these projects contact project Investigators Brad Bergefurd at bergefurd.1@osu.edu, or Dr. Ye Xia at xia.374@osu.edu.



Ohio ranks in the top three states for tomato production, but poor soil health and imbalance can severely impact tomato marketability and overall farm profits.



The first known “high tunnel” in Ohio designed and built at South Centers by Wayne Lewis Farm Manager in 1995. (Brad Bergefurd/South Centers)



USDA grant to help explore soil health and disease management of high tunnels

By **BRAD BERGEFURD** and **BRADFORD SHERMAN**
OSU South Centers/CFAES

New USDA funding coming to The Ohio State University South Centers will help research and develop crop management techniques to increase the soil health and reduce or alleviate the soil disease pressures causing crop and financial losses to farmers.

The research project is titled “Enhancing Regional Adoption of Anaerobic Soil Disinfestation for Soilborne Disease Management in High Tunnel Vegetable Production Systems” and will develop agronomic management systems for improving soil and tomato health for sustainable productivity, and deliver knowledge-based information and approaches for stakeholders can enhance tomato and soil health with reduced reliance on chemical application to benefit human health and environment.

The goals are based on the integration of the holistic, innovative, and ecologically sound agricultural management components, which include arbuscular mycorrhizal fungi (AMF) and cover crop (cereal rye grass) to decipher the indicators of the soil health and tomato soil-borne disease control, by connecting the tomato and soil-associated microbial communities.

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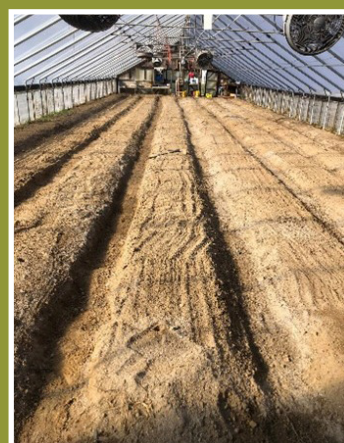
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“There are numerous farmer partners who have shown their support of this needed research and they are volunteering the use of their high tunnels to collect soil and plant samples throughout the year so that the researchers can conduct soil health analysis,” explained project Co-PI Brad Bergefurd, an Assistant Professor and Specialty Crop Specialist with The Ohio State University.

“With over 500 high tunnels being used by area farmers within a 50-mile radius of the OSU South Centers, the results of this research will not only assist our local growers with being more profitable but the results can be adapted to other regions of the United States and the world.”

Bergefurd is partnering with faculty from the USDA and other OSU departments including Principal Investigator Dr. Sally Miller (OSU Plant Pathology) and Soil Scientist & Co-Principal Investigator Dr. Steve Cullman on this \$324,937 USDA, National Institute of Food and Agriculture (NIFA), Crop Protection and Pest Management Program (CPPM) grant.

High tunnel research at South Centers dates back to 1995 when new techniques to increase the harvest and market season of locally grown produce began to be explored. Farm Manager Wayne Lewis took the lead on applying his research experience and his “farmer engineering” techniques to develop a first-of-its-kind moveable, passively heated and cooled field greenhouse structure that was capable of growing crops like they were being grown in Georgia, thus



Early January weather cooperated where soil health samples were collected from farmer cooperator high tunnels throughout southern Ohio. (Brad Bergefurd/South Centers)

bringing crops like strawberries and tomatoes to harvest 1 to 2 months earlier than field grown crops.

This structure, today defined by the USDA as a “high tunnel” was proven successful through repeated research field trials conducted at South Centers throughout the late 1990’s and early 2000’s. Today this technique has been adapted by the USDA as one of its most highly recommended Environmental Quality Incentives over the past 15 years, being adopted by tens of thousands of farmers throughout Ohio and nationwide, allowing farmers to extend their farm income through extending the cropping season earlier and later in the year. Crop management issues have been identified over the years that, over time, can reduce crop yields and crop

quality when grown in these high tunnels with little to no crop rotation. Soil health and soil disease being the main issues faced by growers.

For more information on this and other specialty crop field research being performed at the South Centers, join the horticulture list serv at southcenters.osu.edu/horticulture/join-our-listserv, visit the program’s Facebook page at facebook.com/OSUSouthCentersHorticulture or check out annual research reports published on our South Centers Horticulture web page at southcenters.osu.edu/horticulture.

Contact Brad Bergefurd, Specialty Crops Specialist for more information on this and other South Centers specialty crop field research at bergefurd.1@osu.edu.

\$250,000 grant received to explore new strawberry production techniques

By **BRAD BERGEFURD**

Assistant Professor and Specialty Crops Specialist

Locally produced strawberries have outstanding market potential, however the number of farms growing strawberries and strawberry production acreage are decreasing in many areas of Midwest United States.

High production risk is the main reason causing the decrease of strawberry production in the region. In the past three years, extreme weather conditions across Midwest in spring (late frost, excessive precipitation, drought) have made the traditional matted-row strawberry production even more challenging.

A quarter-million-dollar North Central Sustainable Agriculture and Education (SARE) grant will make it possible for Ohio State University and Purdue University strawberry researchers and farmers to develop and modify strawberry production systems that may reduce this risk and increase profit and market potential.

Many Ohio farms have doubled their harvest and marketing season through adoption of the modified annual plasticulture strawberry production method that was developed by OSU South Centers for Ohio and Midwest cool climate growing conditions. However, growers continue to express more interest in alternative strawberry production systems that have potential to increase yields and harvest seasons, as well as provide increased protection from harsh winter weather and temperature extremes.

Preliminary research on soil-based high tunnel and low tunnel strawberry production achieved promising results that attracted



great attention from farmers throughout Ohio and the Midwest, encouraged South Centers researchers to continue optimizing production practices of using these systems in the lower north-central United States. Encouraged by previous promising results and tremendous grower interest, this project will enhance strawberry production in the north-central region by optimizing soil-based strawberry production practices under three tunnel systems.

The tunnel systems to be researched include: 1) four-season high tunnel; 2) hay grove high tunnel; and 3) low tunnels. Each tunnel system will have a unique research focus: Ultimate crop growth in fall and winter, as well as fertility management to target fast crop growth are focus of the four-season high tunnel system; winter protection materials and suitable cultivars will be evaluated for the hay grove high tunnel system; and suitable cultivars and different timing of install and removal of plastic to maximize crop growth and minimize spring frost damage comprise the research focus of the low tunnel systems.

An integrated research approach including using cultural practices, fertility management, biological pesticides, and bio-control agents will be established to facilitate success of the tunnel strawberry production system. Economic feasibility of the three tunnel systems will be evaluated in the context of different production scales. Project information will be delivered through multiple outreach channels, upcoming field days, conferences and workshops, and a Midwest strawberry production guide under tunnel systems will be developed through the project.

The future of increased strawberry production in Ohio looks great as we continue to research profitable new season extension methods that can be adopted by Ohio farms.

To see research results and production methods on proven season extension strawberry production practices developed by the OSU South Centers visit: southcenters.osu.edu/horticulture/fruits/strawberries or contact Brad Bergefurd. at bergefurd.1@osu.edu.

New partners move into Endeavor Center, space still available

By **RYAN MAPES**

Endeavor Center Manager

Like many businesses and organizations, the Endeavor Center experienced significant challenges during the pandemic. The doors to the facility were closed while employees worked remotely during the onset of COVID-19. Through much of 2020 into 2021 the Endeavor Center was closed to the public.

As knowledge of the virus progresses and safety protocols implemented, the Endeavor Center has been able to reopen to serve businesses in Southern Ohio. Tenants have resumed occupancy of their offices and are following all state, university, and local health guidelines.

Meeting and training rooms can be reserved for in-person business events, but hours of operation are limited. It is recommended to plan ahead when requesting use of a meeting room, as there are new reservation policies in place that can take some time for approval.

The Endeavor Center operated at a 100% occupancy rate for most of 2019, however the pandemic brought both challenges and opportunities. New capabilities and virtual opportunities are being implemented as more meetings and business activities are being held virtually.

Since 2019, several partners relinquished office space - fortunately new partners were ready to come on board to fill the vacated offices. Recent partners that have joined the Endeavor Center include American Income Life Insurance Company, Affiliated Financial Group, FBB Group, and TK Fitness.

Both 400 sq. ft. and 200 sq. ft. furnished office space is currently available for lease to entrepreneurs and start-up businesses. Easy access to a copier, printer, kitchen area, meeting rooms, and Small Business Development Center counselors are just a few of the benefits when leasing an office in the Endeavor Center.

Please contact Jennifer Dunn at dunn.595@osu.edu or Ryan Mapes at mapes.281@osu.edu for any questions regarding usage of the facility.



Let's Be Fit

with **TAMARA KISSINGER**

By **PATRICK DENGEL**

Business Development Specialist

Tamara Kissinger, owner of TK Fitness, has a public fitness training studio located at The Ohio State University Endeavor Center in Piketon. This fitness studio offers multiple services for individuals that are 15 years old and older. Services include personal training, conditioning programs, and fitness classes.

Kissinger is one of two certified personal trainers who provide programs tailored to the individual's needs. "Here at TK Fitness Training Studio, our goal is to offer a supportive environment for you to feel comfortable to explore your goals, evolving them as necessary, and making room for personal fitness while taking consideration for the rest of your life," said Kissinger.

Recently, she teamed up with Brad Bapst, Small Business Development Center Director, to offer a monthly video series Let's Be Fit. The video series offers fitness tips for clientele.

"The video series we are currently working on enables her to reach out to both her existing and potential clientele to keep them updated on current topics and tips related to a healthy living lifestyle," Bapst said of his co-hosting duties.

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SURVEY SAYS: MEP HAD SUPER THIRD QUARTER

By **BRADFORD SHERMAN**

South Centers/CFAES

It was an impressive third quarter in client metrics for the Manufacturing Extension Partnership at The Ohio State University South Centers, says Director Aaron Patrick of Ohio MEP.

"I'm happy to report that South Centers showed marked improvement in the area of client metrics for the third quarter of 2021.

OSU South Centers was able to score an impressive 7 out of 10 on our latest scorecard, which positively impacts the overall Ohio MEP network," said Patrick.



DAWN COLEMAN

The Ohio Department of Development administers the Manufacturing Extension Partnership program on behalf of the National Institute of Standards and Technologies (NIST). Patrick explained that, as part of that cooperative agreement with NIST, MEP programs are graded on 10 metrics each quarter ranging from: Jobs created and retained, New Investments and Cost Savings, as well as New and Retained Sales provided to clients through the delivery of projects.

These metrics are collected by a third-party company through survey results from clients served across the state by the Ohio MEP network. Among the South Centers MEP clients reporting in the quarter included Pittsburgh Glass Works (PGW) and OSCO Industries, which received leadership and sales training, respectively, and Schilling Truss, which benefitted from a financial analysis.

"I would like to thank Ryan Mapes and his MEP team of Mick Whitt and Dawn Coleman for their continued improvement in this area," Patrick continued. He particularly praised the performance of Coleman, who was responsible for some staggering growth numbers in Southeastern Ohio.

"I would like to single out Dawn Coleman for her high-level performance with client outputs of over \$76 million in retained sales, over \$14 million in increased sales, and over 750 jobs created or retained. Thank you for your efforts and continued support of the Ohio MEP program."

The South Centers MEP program is looking ahead to a successful 2022, as the team had added two new members recently in new Growth Advisor Charissa Gardner and Program Coordinator Reid Pope.

The Ohio Channel now re-airing OSU South Centers' short videos

By **PATRICK DENGEL**

Business Development Specialist

The Ohio Channel is a service of Ohio's public broadcasting stations, which provide different video programs on government and educational access platforms. Recently, The Ohio Channel acquired a license from The Ohio State University to re-air different short videos that are produced by The Ohio State University South Centers' Studio Short videos are educational programs ranging from 1-to-5 minutes.



The Ohio Channel indicated that many of South Centers' short video programs are of public value and will be shown on their channel. The Ohio Channel will be re-airing different educational short videos that are produced each month to include topics such as agriculture, natural resources, farmers' markets, healthy living, healthy aging, and others.

The Ohio Channel also indicated that in the very near future, full telecast episodes (28 minutes) on different topics will be re-aired.

Currently, there are 1,170 subscribers to the OSU South Centers YouTube channel with videos being viewed in more than 30 countries. Individuals can view the videos, including the shorts by visiting go.osu.edu/OSUSC.

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"It has been so rewarding working with Tamara and helping be a small part of turning her dream of owning a business into reality."

You can find these videos at go.osu.edu/OSUSC under the playlist Let's Be Fit.

"We are excited to have TK Fitness as a start-up business in the Endeavor Center. Kudos to Tamara for starting a gym during the pandemic as this was a difficult time for many businesses and especially those in the fitness and health industry," said Endeavor Center manager Ryan Mapes.

"Her perseverance paid off, and the gym membership is growing. Having a fitness business on site is unique to the Endeavor Center and provides many healthy lifestyle opportunities to the community."

Kissinger and her staff can be reached at (740) 222-1492 for a confidential discussion of how TK Fitness can provide a personalized training service for you. TK Fitness can be found on Facebook and at tkfitness.business.site.

HERE TO SUPPORT YOU

By **BRAD BAPST**

SBDC Director

Whether your business is just a budding idea or has been around for a few days or a few decades, the Small Business Development Center (SBDC) at The Ohio State University South Centers is ready to support you heading into 2022.

If 2020 was about the resolve and adaptability of the American small business owner, 2021 has been about the grit and determination to build back stronger than ever before. The economic recovery is well underway, and the SBDC remains ready to help prospective, new, and experienced business owners alike in the year ahead. 2022 is poised to be an exciting year, but it won't be without its challenges.

The OSU South Centers SBDC has spent 2021 helping businesses survive and thrive. Many businesses are struggling due to high input costs and shortages in both supplies and staffing.

Other businesses in our region have shifted their structure and are thriving. Some have moved to online sales, limited brick and mortar hours, varied menus, and a shift in products or services.

Entrepreneurs have also seen 2021 as a time to start new ventures in the region as our team assisted with the opening of 14 new businesses.

The SBDC team has been a constant force for these businesses with regular updates on COVID-related funding opportunities throughout the

Consider these tips when you are making your New Year's business resolutions:

1. Write out your business plan. As a soon-to-be or emerging small business owner, the proper business plan can help you conceptualize your vision. It can also prove to lenders and investors that you have a solid foundation for your ideas. Need help structuring your business plan? The SBDC can assist you and mentor you through the process.
2. Explore your funding options. Figuring out how you are going to fund your business is often just as important as the concept behind the business itself. However, such a significant decision doesn't have to be stressful. There are a variety of options for funding small businesses. There are many popular options such as business loans from local banks and local economic development programs. These are the most common forms of financing for small businesses in Southern Ohio. The SBA also offers many options from microloans to 7(a) and 504 loans. The SBA works closely with lenders, reducing risk and streamlining access to capital. That, in turn, makes it easier for small business owners to get the loans they need.
3. Create a marketing strategy. An effective marketing strategy will help get customers talking about your products or services. The SBDC offers business counseling services and training courses that are a great place to start. Topics covered include identifying target market, conducting market research, establishing a marketing plan, and the basics of social media marketing.
4. Get a second opinion from an expert. Navigating the startup process in the recovering economy can be tricky. That is why a business mentor from the SBDC is so valuable. The SBDC offers free business mentoring, counseling, and training — both remotely and in-person. Connect with your local SBDC resource partner today.

past year as well as assisting with increased marketing efforts and review of financials. Training events were held in the areas of starting your own business and online marketing.

2022 will bring a new face to the SBDC team at the OSU South Centers. Melanie Sherman is our newest Business Development

Specialist, and she will be meeting with clients and expanding visibility in our eastern counties. We will also be expanding our virtual and in-person training events, as well as continue to work closely with the chambers of commerce and economic development offices throughout the region.



Data collection at farmers' markets increasing success

Photos and story by ANNA ADAMS

Direct Marketing Team

While the pandemic brought about many changes, one thing that has remained consistent is farmers markets. Markets across Ohio were open in full swing this season and were buzzing with customers. Members of The Ohio State University Direct Marketing Team, as well as the Ohio Farmers Market Coalition and the Ohio Farmers Market Network visited many of these markets to speak to managers about their data collection methods.

This three-year project is funded by the USDA's North Central Region Sustainable Agriculture Research and Education (SARE) Professional Development Project. The purpose of this project is to evaluate the strengths and weaknesses of Ohio farmers markets' work in data collection, and to help create a culture of shared data collection and use to increase farmers market sustainability and success.



Speaking directly to market managers allowed for a deeper insight into what types of data these markets collect as well as where there is room for improvement in collection methods.

Team members spoke to market managers

across the state, from Cincinnati to Cleveland, to learn about how their markets collect and use the data. Responses varied from some markets collecting no data to some using information from vendors and customers to acquire grants and sponsorships.

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First Tri-state CSA conference held

Direct Marketing team helps direct marketers, food producers grow in 2021

By **CHRISTIE WELCH**

*Direct Food and Agricultural Marketing
Program Specialist*

Despite the continued struggles with the global pandemic, The Ohio State University Direct Food and Agricultural Marketing team has continued to adapt to provide resources and education for Ohio's local food producers. With the hopes of having the pandemic behind us, the team planned the first Tri-State CSA Conference, titled Thinking Inside the Box, to be held in-person.



Growing CSA's across the Tri-State Region

A recording of the conference can be viewed at:
go.osu.edu/csa

Unfortunately, due to continued concerns about the pandemic and to keep everyone safe, the conference pivoted to a virtual format. Collaborating on the Tri-State CSA Conference were OSU Extension Fulton County Educator Eric Richer; SARE State Coordinators in Ohio, Michigan, and Indiana; and Michigan State and Purdue universities. The virtual event was attended live by 62 participants and recordings of the presentations have been viewed 86 times.

Comments on the post conference evaluation included: "Fantastic speakers! Sharing specific information of what worked for them and life-family balance that was reality based" and "Very informative!"



The team is in the process of planning the 2022 Tri-State CSA Conference to be held in person in the fall. If you would like to be added to the listserv for information about the conference, please email welch.183@osu.edu.

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The information gathered can help more markets understand their role in the local food system, and better understand how to best serve their customers.

If you would like to learn more about this project, please contact Christie Welch at welch.183@osu.edu.

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department

of Agriculture, under agreement number 2019-38640-29879 through the North Central Region SARE program under project number ENC19-185. USDA is an equal opportunity employer and service provider. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Learn more about this project on the Knowledge Exchange Podcast: kx.osu.edu/podcast/8-emerging-christie-darlene.

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Factsheets

According to Feeding America Action's 2020 Project Overall Food Insecurity Rate, food insecurity is predicted to increase in Ohio by up to 28% in some counties. While the data is not yet available, anecdotal information has demonstrated that food insecurity was exasperated by the pandemic. In response, many Ohio farmers markets that accept SNAP benefits and offer nutrition incentive programs saw participation in the food assistance programs increase. Produce Perks reported \$2.2 million in health food sales and 22,619 customers served. Produce Perks works with farmers markets across Ohio to implement nutrition incentives.

To assist more farms and farmers markets to accept nutrition incentives, the team developed a series of factsheets. The first two in the series: Introduction to Nutrition Incentives and Types of Nutrition Incentives Offered at Ohio Farmers Markets and How They are Funded have been published on Ohioline. Two additional factsheets on the topic are planned for 2022.

DeviceReady

Late in 2021, as the state began to hold in-person gatherings again, the team had an opportunity to offer DeviceReady to Pickaway County businesses in cooperation with the Pickaway County Chamber of Commerce. DeviceReady offers social media marketing training to assist farms and businesses with becoming more visible online to better connect with their customers. The resulting connections increase the sales of locally produced and direct marketed food and agricultural products. As consumers increasingly turn to online resource to make purchasing decisions, having an effective online presence is crucial for success. If you would like information about hosting a DeviceReady training in your county, email welch.183@osu.edu.



Youngster Cuinn Sherman feeds a pony while enjoying one of the many agritourism spots located throughout Ohio. (Bradford Sherman/CFAES)

Virtual Agritourism Conference

The 4th annual Ohio Agritourism Conference was held virtually due to the pandemic. As agritourism continues to be a viable option for Ohio farmers to diversify their income, continuing to provide training and education to help them make informed decisions is critical for their success. More than 100 registered for the virtual conference and the recordings are available to be viewed at: go.osu.edu/agritourism2021.

In addition, the team worked with several stakeholders across the state in 2021 – assisting the Ohio Produce Growers and Marketers Association with hosting their 2021 conference virtually, and helping several Ohio producers with development of their application for the USDA's Value-Added Producer Grant, resulting in \$250,000 award for an Ohio grower. The team also applied, and has been accepted, to the International Agritourism Conference (postponed from the fall of 2021 to the fall of 2022). Team members Eric Barrett,

Rob Leeds, and Christie Welch will present Agritourism Emergency Preparedness to help farmers and farmers markets develop an emergency plan. If you would like to learn more or develop a plan for your farm you can do so here: u.osu.edu/agritourismready.

Finally, the team continues to work with organizations throughout the state to help Ohio's farmers and food producers be successful. Numerous presentations on a variety of direct marketing topics were given virtually to the Ohio Beekeepers Association, OSU Agricultural and Natural Resources, and Family and Consumer Sciences educators during their annual conferences; collaborated with the CFAES Center for Cooperatives to offer direct marketing training to producers in West Virginia; and many more. The team also continued its monthly Marketing Matters video series to discuss a variety of topics related to direct food and agricultural marketing. You can view the videos here: southcenters.osu.edu/direct-marketing/marketing-matters-videos.

SOACDF grant will fund additional leadership experiences for local youth

By **JOY BAUMAN**

Co-ops Program Specialist

The CFAES Center for Cooperatives is pleased to announce that prior to the sunsetting of the Southern Ohio Agricultural and Community Development Foundation (SOACDF) at the end of 2021, the Foundation awarded the Center for Cooperatives a \$75,000 grant to fund five iterations of the Youth Cooperative Leadership Experience (YCLE), with one Experience per academic year from 2022 through 2026. As part of the CFAES Center for Cooperatives mission to integrate teaching, research, and Extension programs to create and extend knowledge relevant to the cooperative business model, Center staff conduct public education about cooperative business throughout Ohio and West Virginia, including high school students.

The Youth Cooperative Leadership Experience is an immersive learning program for Appalachian high school students in the primary counties served by SOACDF. The goal of the YCLE is to help students learn about agricultural careers and achievable paths to higher education through the cooperative business model. YCLE participants engage in classroom and hands-on learning, business, lab and farm tours, professional networking opportunities, and team building. These opportunities are particularly vital in Ohio's Appalachian region, where educational attainment is lower than other regions and where residents have historically experienced economic challenges.

Since FY 2010, the Foundation's grant programs and operating expenses were supported by an endowment fund that was not subject to the



General Assembly's appropriation process. Until then, the Foundation had been appropriated funding based on the stream of revenue derived from the 1998 Tobacco Master Settlement Agreement (MSA) between the states and major tobacco manufacturers. Most of Ohio's share of those proceeds was set aside for public school and higher education facilities

construction. Since SOACDF was formed in 2002, the Foundation has awarded more than \$120.7 million to farm families and rural communities in the form of grants distributed to farmers, businesses, and youth in the 22 burley tobacco-producing counties in southern Ohio.

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Grants were distributed for agricultural diversification, economic development, young farmer assistance, research and development, livestock systems, livestock genetic improvement, grain handling, general ag improvement, and education. In the later years, the Foundation also funded grants for capital improvements for numerous county fairgrounds.

During the Foundation's timespan, Business Development Network team members also provided consulting and guidance to hundreds of farmers and businesses throughout the region at no cost to the client.

"These projects not only put money in the pockets of farmers and businesses who were grant awardees, but those recipients, in turn, spent most of their grant dollars locally to build infrastructure and make purchases of equipment and livestock, keeping those dollars circulating in Southern Ohio for years to come," said Joy Bauman, program specialist for the CFAES Center for Cooperatives, "Not forgetting the increased farm and business productivity and revenue that grew as a result of the SOACDF-funded projects."

Bauman spent countless hours providing assistance to SOACDF applicants over the phone and through email in her previous role at the South Centers, before beginning work full-time with the Center for Cooperatives. For the final round of SOACDF funding before the Foundation's closure at the end of 2021, the board of directors chose to offer grants to Youth Development programs in the nine primary tobacco producing counties that were most impacted by the Tobacco Master Settlement Agreement. For this final grant opportunity, Bauman assisted the Ohio Valley CTC FFA and the Peebles FFA with their successful grant applications which will benefit the schools' student-led cooperatives that the Center has helped to start or are in the process of starting.

"We have always emphasized the importance of youth in our industry and communities," said Eric Wolfer, chair of the SOACDF board of directors, "beginning with college scholarships and progressing into multiple successful programs over the years."

Bauman and Hannah Scott, program manager for the Center for Cooperatives, also developed a \$75,000 proposal for the Foundation to fund the successful Youth Cooperative Leadership Program for five years. "We are grateful that the SOACDF board selected our YCLE project as one of the benefactors of this final round of funding," said Scott.

The YCLE is expected to engage approximately 50 high school agriculture students and 5 adult chaperones annually. The goal of the YCLE is to help students learn about agricultural careers and achievable paths to higher education from a cooperative perspective. Cooperative Program Specialist Joy Bauman explained that students will be educated on the cooperative business model as a sustainable marketing and management model for agricultural enterprises, including farms and agribusinesses. "They will be introduced to agricultural careers through tours of cooperative businesses and co-op member farms, as well as have the opportunity to engage and make connections with individuals in the agriculture industry, as well as participate in college-style learning experiences," Bauman said.

Plans for the autumn 2022 Youth Cooperative Leadership Experience are underway. Watch for details soon about the participant selection process.



Amy Lynd, of Lynd Fruit Farm, shows off some new, yet-to-be-named variety of beautiful, large yellow apples to YCLE participants.

2021 was a year of **outreach**, **research**, and **collaboration**



SOIL, WATER, AND BIOENERGY RESOURCES

By **DRS. RAFIQ ISLAM** and **ARIF RAHMAN**
SWBR Program

The Soil, Water, and Bioenergy Resources (SWBR) program at The Ohio State University South Centers focuses on developing, managing, and disseminating science-based knowledge on economically viable, environmentally compatible, and socially acceptable agricultural management practices to address climate change, water quality and management, and food quality and public health of the state of Ohio.

Extension Outreach Activities

Visitors returned to South Centers for an August field night focused on aquaponics and hydroponics systems. The event was attended by 28 aquaponic and hydroponic growers, farmers, educators, students, and other clientele, and was sponsored via a USDA capacity-building grant with Central State University (CSU). Several presentations were delivered, and demonstrations were performed to showcase both aquaponics and hydroponics research by Rafiq Islam, Brad Bergefurd, Arif Rahman, Thom Harker, Krishnakumar Nedunuri (CSU), and guest speaker Jenni Blackburn, co-owner of the family-owned Fresh Harvest Farm in Richwood, Ohio. Attendees had the opportunity to tour the South Centers aquaponics research system. Topics covered were ones beneficial to both beginners and experienced aquaponics farmers, and included system selection and maintenance, plant and fish production, water quality, social media and marketing, and business success/finances.



Dr. Rafiq Islam, program leader for Soil, Water, and Bioenergy Resources at South Centers, is pictured at the aquaponics and hydroponics field night. (Sarah Swanson/South Centers)

Several SWBR personnel attended at the 2021 Ohio No-Till Council annual meetings. Several presentations and discussions were held on micronutrients availability and crop yield sustainability, no-tillers approach and Federal Government, OSU-CFAES discoveries and lessons learned in no-till systems, ag technology (precision, automation, compaction, heavy vehicles, and their effects on soil health), and new technologies for plant protection. Rafiq Islam participated in a panel discussion on soil health, no-till, and cover crops associated with climate-smart agriculture.

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Scenes from the Aquaponic/Hydroponics Impacts and Opportunities field night held in August at South Centers in Piketon.



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The SWBR conducted an agro-tourism event to entertain 52 Ohio (Morrow county) Soil and Water Conservation District personnel when they visited South Centers in Piketon. During the visit, they were provided with evidence-based knowledge associated with applied research and education activities on aquaponics/hydroponics, climate-smart agriculture, soil health, food quality and public health, and agroecosystem services. Islam and Rahman

delivered a virtual Extension presentation titled “Cover crops complement no-till soil quality and agroecosystem services” to the needs of the farmers, educators, and professionals at the Midwest Indigo Soil Health Meetings.

Islam was actively involved internationally, participating in virtual presentations and teaching of farmers, students, educators, and professionals at different field days and meetings in Ukraine.

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He and Dr. Nataliia Didenko delivered an Extension presentation to 30 farmers and educators on potential opportunities and benefits of no-till farming. The event was held at a no-till farmer's field in the Kherson region (Oblast) of southern Ukraine. Moreover, Islam participated virtually at the World Soil Day international conference "Transformations in Ukrainian Soils and Conservative Innovations," organized by The National University of Life and Environmental Sciences of Ukraine in December 2021. He and Dr. Didenko delivered a presentation titled "Regenerative agriculture to improve soil health and crop productivity in Ukraine" to the audience of more than 100 participants from Ukraine, Romania, Moldova, Poland, and other east European countries. Moreover, he has participated at the International Symposium on Coastal Agriculture (ISCA Webinar): "Transforming coastal zone for sustainable food and income security" organized in virtually in March 2021. Islam delivered his invited talk titled "Nano-fertilization and chemical inducing to improve crop growth" to an audience of more than 300 participants from Bangladesh, India, Nepal, and Sri Lanka to recommend short-rotation, high-value crops, especially vegetables that can be grown sustainability using nano fertilization, via foliar fertilization, soil application, or both, and drip irrigation or chemigation. Salicylic acid (aspirin as an economic and a widely available source) can be used to improve plants' tolerance to abiotic (e.g., salinity) and biotic stresses, via seed treatment, foliar fertilization, root treatment (dipping into solution), soil applications, and drip irrigation or chemigation.

In response to worldwide soil and water quality degradation by secondary salinity and its impact on agricultural sustainability and global food security, Islam participated at the Integrated Salinity Management (ISM2021) virtual workshop titled "Salicornia potentials; Forage production and value change in coastal area." He delivered a virtual presentation titled "Salicornia as a potential forage to reclaim salt-affected soils" to more than 100 audience participants of Middle-eastern and North African countries. His presentation focused on novel and holistic approaches with proactive and target-specific objectives for sustainable management of saline soils using Salicornia (halophytes) to support for food, forage, fiber, and bioenergy production with improved ecosystem services in the coastal agriculture.



The 2021 Ohio No-Till Council annual meetings featured presentations and discussions on micronutrients availability and crop yield sustainability, no-tillers approach and Federal Government, OSU-CFAES discoveries and lessons learned in no-till systems, ag technology (precision, automation, compaction, heavy vehicles, and their effects on soil health), and new technologies for plant protection.

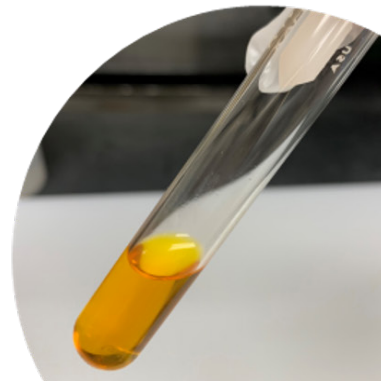


Research, Demonstration, and International Collaboration

The SWBR program team submitted and received research grant funding from Ohio Vegetable and Small Fruit Research and Development Program (OVSFRP), Ohio Department of Agriculture (ODA), U.S. Embassy (Moscow) and American Councils for International Education (ACIE), and Civilian Research and Development Foundation (CRDF-Global) and Ukrainian Ministry of Science and Technology to work on research, academic, and Extension programs.

The SWBR program, in conjunction with the Specialty Crops program (Brad Bergefurd) received a seed grant from OVSFRP. The objective of the research was to evaluate the effects of different rates of conventional, chelated, and nano-Fe fertilization on the growth and yield with especial reference to food quality and public health benefits of processing tomatoes. Research focus was emphasized on public health aspects of essential nutrient density, anti-oxidants, and lycopene as influenced by climate-smart agriculture.

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Dr. Arif Rahman takes readings while working on a tomato project in the Soil laboratory. (Bradford Sherman/CFAES)

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A collaborative ODA Specialty Crop grant titled “Improving tomato yield and quality using nano fertilization with salicylic acid” was received by the SWBR program along with the Specialty Crops program (Brad Bergefurd), and OSU Athens Extension (Ed Brown).

Islam and Rahman, in collaboration with scientists and professors from the Institute of Water Quality and Land Reclamation, Kherson State Agrarian University, Dnipro State Agrarian University, and Kyiv, National University of Life and Environmental Sciences, and Serney Agricultural Station in Ukraine, received a CRDF-Global US-Ukraine alternate energy research development grant proposal working on proactive recycling of biosolids to rejuvenate soil health of marginal and degraded lands for sustainable production of bioenergy feedstocks in Ukraine. The research was on-going at four different sites in Ukraine using biosolids (sewage sludge) as a source of soil amendment and fertilizer expected to improve vast areas of degraded and marginal lands in Ukraine for growing sweet sorghum to produce bioenergy (Ethanol). Sweet sorghum is a drought-tolerant C4 double sugar crop that has more sugar (20-23%) than sugarcane (~17%). After squeezing sugar, the bagasse will be biochemically processed for cellulosic sugars to produce Ethanol as a fuel and other forms of energy.

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After processing bagasse, the leftover materials will be treated and converted to produce activated charcoals or biochar as soil amendments or biopolymers for everyday-use consumables.

The SWBR program also received a U.S.-Russian UniVIP Grant Program titled “Strengthening U.S.-Russian capacity building collaboration through joint-institutional teaching and research development” to develop, share, and exchange up-to-date information and proactive approaches for academic education and capacity-building among professionals between The Ohio State University (OSU) and University of Tyumen (UT), and equip the latter with knowledge and tools to strengthen and sustain programmatic development in these areas. Islam and Bradford Sherman are leading the project.

So far, the project collaboration delivered both learning and action outcomes based on layers of diverse, practical, and interpretative approaches, methods, and tools via academic courses, educational materials, virtual modes of teaching and learning, hands-on practice, demonstration, and assistance for faculty and students. Greater exposure, knowledge, awareness, skills, and virtual modes of teaching and learning of faculty members, administration, and students at UT and other Russian academicians on climate change effects, soil and environmental quality, research methodology, regenerative agriculture, food security, data analytics, and visualization. Increased motivation among faculty members and students at UT to upgrade and modernize academic courses and participate in academic research activities to fulfill the requirements of higher degrees and professional development. Motivated and enthusiastic administration at UT is currently working to strengthen their institutional capacity building by removing roadblocks and providing logistic support for conducting nationally-prioritized, mission-driven research studies via the Russian Ministry of Science and Higher Education. Improved understanding and active collaboration among faculty members at OSU and UT impacted OSU’s involvement in global academic and research leadership, including Russia.

On-farm research was established to evaluate the effects of no-till and cover crops on soil health and its relationship with food quality and public health at Brandts Farm at Carroll, Fairfield County, Ohio. The study used a mixture consisting of hairy vetch (winter tolerant legume nitrogen for corn), clover (legume nitrogen for corn), cereal rye, and oats to build soil quality and provide balanced nutrition via cover crops to improve food quality.



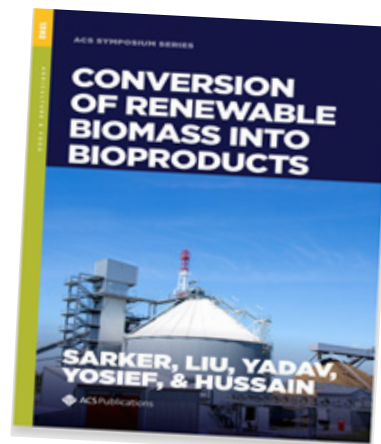
Tools and Technology

Maintenance of soil health is important to sustain crop productivity. Likewise, building soil organic matter (or carbon sequestration) is important to improve soil health and address global food security. Considering the two issues of climate-smart agriculture, we developed and marketed two global licensed technology for farmers and other clientele, one on “OSU soil quality/health field test kit” and the other one on “Buckeye SOM Calculator” in conjunction with SoilOne Inc.

Publications and Books

Based on long-term research data collection, Extension activities, and work experience, SWBR program team members involved in collaborative applied and academic research with scientists,

students, and professors from different countries proactively utilized their time to publish several peer-reviewed journal articles and book chapters. There were 12 papers published in Land Reclamation Water Management; Applied Soil Ecology; PLOS ONE; Agronomy; Horticulturae; Water, Air, Soil Pollution; Fresenius Environmental Bulletin; Soil and Tillage Research; Pedosphere; Soil Use and Management Communications in Soil Science and Plant Analysis; and Eurasian Journal Soil Science. Rahman wrote a book chapter titled “Extraction of valuable compounds from agricultural crop residues and wastes,” published by the American Chemical Society (ACS) in November 2021.



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Recognition, Awards, and Services

In 2020, the SWBR program was recognized with several awards and provided professional services in several areas. The program was listed on the OSU Laboratory Safety Dean's List. The program was twice recognized by U.S. Congress for helping to develop and mentor young leadership in Africa via the Mandela Washington Fellowship.

Islam is serving as one of the academic editors of the PLOS ONE journal. He is also serving as one of the editorial board members of the Journal of Botanical Research and Applications, American Journal of Plant Sciences, and Land Reclamation and Water Management. Islam also served as one of the technical review committee members of the National Research Council / National Academies of Sciences, Engineering, and Medicine fellowships.

In 2020, Islam reviewed USDA-FAS, CRDF Global, OSU President's accelerated and internal grants, Sustainability Institute proposals, USAID's Middle East Regional Cooperation (MEAC) - Agriculture Panel, CEAES Annual Meeting Research presentations review, as well as Fulbright fellowship proposals (Egypt) and more than 25 peer-reviewed journal articles.

Rahman reviewed proposals from the Ohio Academy of Sciences, USDA-Borlaug Programs, Ohio EPA, and CEAES Annual Meeting Research presentations, and articles from PLOS ONE. Program personnel were proactively involved in national and international academic, research, and outreach programs to improve institutional capacity building and professional development of faculty members, researchers, and students.

Aquaculture Research Achievements 2021

By **DR. HANPING WANG**

Aquaculture Program Leader

In 2021, in collaboration with The Ohio State University Department of Animal Sciences, Southern Illinois University and several other international institutions, Ohio Center for Aquaculture Research and Development (OCARD) accomplished six research studies and projects resulting in six manuscripts being submitted.

The program published three peer-reviewed journal articles and two proceedings papers, with three research papers from OCARD winning scientific excellence awards from Benha University in 2021.

"We are halfway through authoring a newbook a titled 'Epigenetics in Aquaculture.' We won a national competition for an aquaculture grant and completed/submitted five new grant proposals," said Dr. Hanping Wang, who leads the Aquaculture program at South Centers. "Our Aquaculture Genetics Laboratory also received the 2021 Dean's List Award of achievement, recognizing the lab's safety research operation and management."

Refining monosex technology in yellow perch

Hormonal effect on sex differentiation and growth in juvenile: We completed a study on the effects of methyltestosterone (MT) on sex differentiation and growth in juvenile yellow perch. The identification of the labile period of sex determination that is manipulated by MT dosage and age of treatment in this study would be a valuable progression toward optimizing commercially viable regimes for commercial scale production of all-female yellow perch for the aquaculture industry. This paper was published by Fish Physiology and Biochemistry here: doi.org/10.1007/s10695-021-01038-0



Fast-growing monosex yellow perch created by OCARD.

The effect of density on sex differentiation, stress, and related gene expression: An experiment was completed to evaluate the effects of density on sex differentiation, sexual dimorphism, stress, and related gene expression.

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Aquaculture wins research, grant, and publication awards

By **DR. HANPING WANG**

Aquaculture Program Leader

In 2021, the Ohio Center for Aquaculture Research and Development (OCARD) at The Ohio State University South Centers won a national competition for aquaculture research grant dollars from the USDA.

USDA funds only four aquaculture projects each year in the areas of genetics, nutrition, disease, and aquaculture system. OCARD won the award of \$300,000 in the genetics category for 2021. This grant will be used for refining the technology for production of commercial-scale, fast-growing monosex yellow perch, and demonstration of their growth and production vs. mixed sex populations for the aquaculture industry.

In addition, OCARD completed and submitted five new grant proposals to USDA, National Academy of Science (NAS), NOAA, Ohio Sea Grant, and Soybean Aquaculture Alliance in 2021.

Three publications win excellence awards

Three research papers from OCARD won scientific excellence awards from Benha University in 2021. Former aquaculture PhD student at OSU South Centers Dr. Hiam Elabd is the first author of those papers and South Centers aquaculture staff Hong Yao, Paul O'Bryant,



Three research papers from OCARD and former OCARD PhD student Dr. Hiam Elabd's dissertation won scientific excellence awards in 2021.

and Dean Rapp are co-authors. Dr. Hanping Wang is corresponding author.

Three research papers from OCARD and former OCARD PhD student Dr. Hiam Elabd (the 2nd from right)'s dissertation (advised by Dr. Hanping Wang) won scientific excellence awards of Benha University in 2021.

Aquaculture Genetics Lab on Dean's List

The Aquaculture Genetics Laboratory at OSU South Centers received the 2021 Dean's List Award of Achievement, recognizing the laboratory's safety research operation and management. This is the second time the laboratory received this honor. South Centers staff Hong Yao is the manager of the laboratory and has put a lot of effort and hard work into management of the lab research, operations, and equipment.

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In this study, we found that stocking density did not influence the sexual determination of yellow perch. However, high density is a chronic stress that has adverse effects on fish wellbeing, growth, survival, expression of stress-related genes, and mobilization of liver reserve. A stocking density of 1,000 fish/m³ could be recommended to reduce stress, increase survival, and provide a better state of wellbeing and growth performance for rearing management of juvenile yellow perch for farmers. This paper is being published by PLoS One.

Proteomic profile and characteristics of skeletal muscle of the fast-growing perch: We completed a study on comparing skeletal muscle proteomic profiles, histochemical characteristics, and expression levels of myogenic regulatory factors between fast vs. slow-growing yellow perch and identified the proteins that might play a crucial role in muscle growth. The identified proteins could be useful markers of muscle growth to improve the growth performance in yellow perch. The study was published in Scientific Reports in 2021: doi.org/10.1038/s41598-021-95817-7



OCARD-created fast-growing bluegill male vs. female in the same family

Refining monosex technology in bluegill

We completed an experiment of the effects of high and low temperature on sex ratio and growth of bluegill sunfish. Much interest has been generated concerning the development of monosex male populations of bluegill due to their rapid growth capacity relative to females. In this study, we found the temperature had significant effects on sex ratios in bluegill, suggesting the interesting possibility of selecting thermo-sensitive genotypes in breeding programs for mostly male populations and controlling sex by monitoring temperature in this species. The manuscript is in preparation for these research results.

The Ohio State University South Centers
1864 Shyville Road
Piketon, OH 45661
Phone: 740-289-2071
Toll Free: 800-297-2072
Fax: 740-289-4591
southcenters.osu.edu



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