

CONNECTIONS

Official Newsletter of The Ohio State University South Centers

Fall | 2018

IN THIS ISSUE:



Raspberry production in a different light

Page 2

Co-ops Pages 4-5



South Centers Staff
profile: Jordan Maxwell
Page 6

Business Pages 7-8

Direct Marketing... Pages 9-10

SWBR Pages 11-13

Recent Pubs..... Page 15

Dr. Hanping Wang's new book published by Wiley-Blackwell

Dr. Hanping Wang's book "*Sex Control in Aquaculture*" has been published by Wiley-Blackwell after three years of planning, coordination, writing, and revising. The book consists of two volumes and has a total of 888 pages.



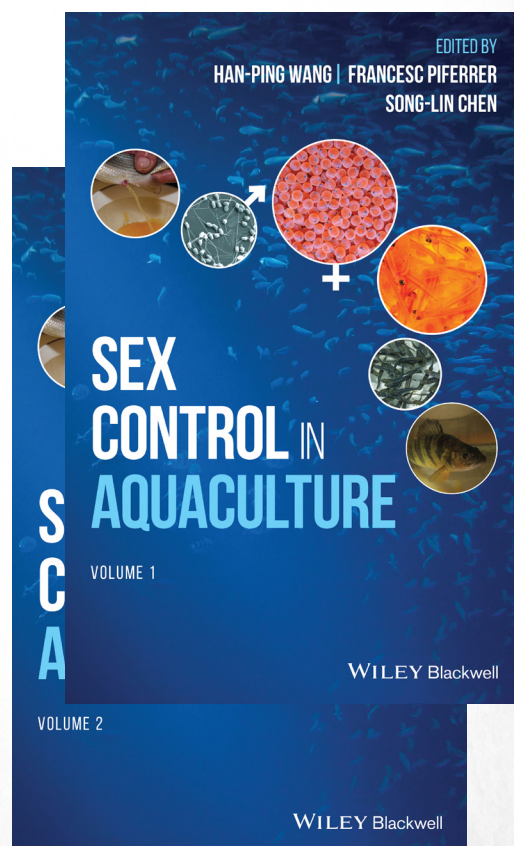
Dr. Hanping Wang

The Editor-in-Chief is Dr. Hanping Wang, Principal Scientist at the Ohio State University South Centers' aquaculture research center, in addition to co-editors Dr. Francesc Piferrer of Spain and Dr. Song-Lin Chen of China. Dr. Wang and his aquaculture team also contributes six chapters of the book.

Sarah Swanson assisted in chapter coordination and Joy Bauman, Bradford Sherman, and Jordan Maxwell assisted in English editing.

The first comprehensive book of its kind, *Sex Control in Aquaculture* covers basic theory for sex control and sex control practice in major aquaculture species worldwide. It consists of 41 chapters and the contributors are internationally recognized scientists from around the globe. Currently, aquaculture, the fastest growing food-producing sector, contributes about 50 percent of the world's food fish based on the Food and Agriculture Organization's recent report.

See *BOOK* Page 2



Raspberry production

IN A DIFFERENT LIGHT

By Dr. Gary Gao

*Ph.D., Associate Professor
and Extension Specialist
OSU South Centers*

and Ricardo Medina

*Visiting Scholar
OSU South Centers and
Ph.D. Student
University of São Paulo*

If you have time to stop by the greenhouses behind Howlett Hall on the CFAES campus of The Ohio State University, you will likely see a compartment of raspberry plants under some pink/purple LED lights. The project is being conducted by the visiting scholar Ricardo Medina of Universidade de São Paulo in Brazil, and is a joint project of Dr. Gary Gao's fruit production systems research and Dr. Chieri Kubota's controlled environment research.

See LIGHT Page 3



Ricardo Medina, a visiting scholar and PhD student from University of São Paulo in Brazil, and Dr. Gary Gao, Associate Professor and Extension Specialist at South Center, are pictured along with Medina's experiment on raspberry production under LED lights.



BOOK from Front

Sexual dimorphism in growth performance, ultimate size, and gonad value (e.g. Caviar) in a wide spectrum of fish species make the sexes unique from each other for aquaculture production for human consumption. On the other hand, energy expenditure for reproduc-

tion related processes and activities, including gonadal development, courtship, chasing, mating, breeding, competition, parental care, etc. are undesired in terms of food production. Therefore, sex control and monosex production knowledge and technologies are extremely important for aquaculture professionals and industries to improve production, reduce energy consumption for reproduction,

and eliminate a series of problems caused by mixed sex rearing, and for conservationists to control invasive species using sex control approach. This publication provides very useful scientific information for commercial use, biological sciences, and for aquaculture researchers. For more information about the book, please visit: onlinelibrary.wiley.com/doi/book/10.1002/9781119127291

LIGHT

from Page 2

Below is the brief summary of Medina's Research Project:

Low temperatures and limited amounts of sunlight during autumn and winter time can be limiting factors for raspberry production in higher latitudes, especially inside greenhouses where the transmittance of light can be very low.

Usually, plants in the field lose their leaves and go through dormancy; since many chilling hours are necessary for the buds to overcome dormancy, their harvest period is concentrated in summer, when the prices paid for the fruit are the lowest.

The experiment consists of growing raspberries in greenhouse conditions, using containers with substrates and intercanopy LED lights as supplemental lighting. With the warm temperature inside the greenhouse and the supplemental light provided by LED light bars, it is expected that the plants will not go through dormancy.

The experiment has three different treatments considering the light intensity including: two layers of LED interlighting bars, a single layer of LED interlighting bar, and no artificial light. In addition, two cultivars with different fruiting habits are being tested. Plants will be tested for growth rate, harvest period, yield, and fruit quality in terms of marketable parameters, but also nutritional quality such as phenolic compounds content and antioxidant activities.

Medina got a chance to sit in on Dr. Chieri Kubota's Lecture on Controlled Environment. He also showcased his research project to the students of HCS 3200. Here is the summary by Medina:

The lecture presented by Dr. Chieri Kubota was addressed to the HCS 3200 – Horticultural Science class. Dr. Kubota was introduced to the students by Dr. Wendy Klooster at 10 a.m. and started her presentation focusing on controlled environment production systems, such as greenhouse (GH) and indoor production. She brought the key components required for each system and did some comparisons between those systems and the open field method for lettuce production, with data on spacing, yield, energy spent, total cost, and cost per unit produced – ending in a conclusion that indoor farming and greenhouse production can have an initial cost higher than open field, but due to a higher yield (units of lettuce head per area), the final cost per unit represents no more than 15% of increase compared to the open field system. This small increase in the cost may be overcome by a higher selling price when well-advertised that the product comes from controlled environment production, being a pesticide-free product (when that is the case).

The manipulation of the environment was presented by Dr. Kubota in many aspects including hydroponics systems, management of light quantity and quality, and CO₂ concentration. The light quality can be manipulated using LED lights, where you can deliver to plants the exact wavelengths combination you want, once LED lights are a monochromatic source of light. Combinations of red and blue lights have been studied for many leafy greens, and more recently, for tomatoes and other crops. Other advantages of LED lights include less heat emission and the higher light use efficiency, with a better conversion of energy consumption to energy use in photosynthesis. Also, the



CO₂ can be manipulated to enhance tomato production up to 20% and leafy greens up to 50% when increasing CO₂ content from 400 ppm (current air concentration) to 800 – 1,000 ppm.

Dr. Kubota gave some examples of successful greenhouse and indoor farming in Ohio, New York City, Boston, and Tokyo. She also discussed future applications in controlled environment production with the use of drones and image recognition for real-time data collection in terms of the nutritional, pathological, and physiological status of the crop. She concluded her presentation willing a better interaction in between companies as well as academia, and suggests an open communication platform to share knowledge and technologies for indoor and greenhouse controlled environment production.

Following the presentation, a tour with students was conducted by Dr. Kubota, Mark Kroggel, and Medina at the Howlett greenhouse facilities. The tour began with strawberry production in a soilless system, where Kroggel explained how they grow strawberries using trophy and substrate, with supplemental LED lights over the canopy of the plants. The students asked questions about cultivars, sunlight radiation, disposition, and spacing of the trophies.

The tour continued to the greenhouse where a raspberry production system is being tested. There, Medina explained to the students his project, consisting of growing raspberries in containers using intercanopy LED lights to make plants avoid dormancy, and the effects of the system in the plant growth, harvest period, yield, and fruit quality in terms of marketable parameters and nutritional quality. Students asked questions about plant dormancy, light treatments applied, and comparison to the traditional raspberry production system. This project is part of Dr. Gary Gao's small fruit projects in collaboration with Dr. Kubota.

The last greenhouse visited was the teaching greenhouse, where undergrad students can learn how to grow leafy greens, vining crops, and have the opportunity to understand different hydroponics systems.

Acknowledgements: We would like to thank Dr. Abhay Thosar, a senior Plant Specialist of Horticulture LED for Signify (signify.com/en-us) in United States and Canada for the generous donation of LED lights used in the study. Their global brands are Philips (lighting.philips.com/main/products/horticulture/language-selector) and Interact (interact-lighting.com/global) Stay tuned for more exciting results from this project! Please visit southcenters.osu.edu/horticulture/fruits for more information on Dr. Gary Gao's research projects and extensive activities.

Student-operated cooperative now managing 300-acre farm at OVCTC

CFAES Center for Co-ops working with Ag Business Management students at school

By Joy Bauman
Center for Cooperatives
Program Coordinator

The CFAES Center for Cooperatives team has been working with the Agriculture Business Management students at the Ohio Valley Career and Technical Center in Adams County, Ohio to form a student-operated cooperative to manage the school's 300-acre farm. The farm is a learning laboratory, providing valuable opportunities for students to gain hands-on experience managing and operating a farm.

The students and Mr. Luke Rhonemus, the Farm Business Management program instructor and FFA advisor, have developed a relationship with the OSU South Centers staff over the past few years, starting with Joy Bauman who is currently a program coordinator with the Center for Cooperatives. Joy assisted the program in developing a working business plan for the school farm when Mr. Rhonemus first became the OVCTC Agriculture Business Management instructor in August 2016. Joy conducted farm business planning workshops and provided guidance to the students as they developed their farm business plan, which enabled the school farm to receive a \$25,000 agriculture development grant from the Southern Ohio Agricultural and Community Development Foundation for infrastructure improvements and equipment purchases. At that time, the school farm comprised just over 100 acres.

Recently, the district purchased an additional 200 acres to allow the students to expand the farm operation. Presently, the students raise beef cattle, meat goats, market hogs, corn, soybeans, and hay. For many years, tobacco was raised on the school farm, but presently, the students only raise tobacco seedlings in the program's greenhouse to be sold as transplants. In addition, the students manage 300 taps for maple syrup production. The students sell the syrup, as well as freezer pork and hay.

Mr. Rhonemus, who is in his 17th year of teaching high school agriculture and is a lifelong farmer himself, wanted the students to get as much practical experience as possible, including making management decisions, hands-on production, and marketing.

See *FARM* Page 5



With a 300-acre school farm, the students in the agriculture programs at the Ohio Valley Career and Technical Center have a tremendous opportunity for hands-on experience in many areas of agriculture production and management. By forming a student-operated farm cooperative, they are also learning about the cooperative business model and managing the business through a board of member-elected student directors.

Harlow wins Innovation Award

By Joy Bauman

Center for Cooperatives

Program Coordinator

Congratulations to CFAES Center for Cooperatives program specialist, Ivory Harlow, who was recently presented with the Ohio State University CFAES Staff Advisory Council Innovation Award. OSU Extension Director Dr. Roger Rennekamp and OSU South Centers Director Dr. Tom Worley made the presentation during the annual CFAES Center for Cooperatives advisory committee meeting. The Innovation Award is one of the “Above and Beyond” Awards presented annually by the CFAES Staff Advisory Council to a staff member for their role in developing and/or participating in project initiatives and/or process operations improvements that enhances CFAES, Extension, ATI, or OARDC and their mission. Rennekamp explained that Ivory was selected for this honor because of her work to conceptualize and create the *Co-op Mastery: Beyond Cooperatives 101* online cooperative education platform.



“Ivory is a great asset to the Center and we appreciate the wonderful contribution she has made to expand the reach of our cooperative education,” Worley said when presenting her award.

FARM

from Page 4

The CFAES Center for Cooperatives staff members have been working with the students to develop a student-operated farm cooperative using the worker-owner cooperative model. The students learned about agricultural cooperatives and cooperative principles through lessons taught by Hannah Scott, Joy Bauman, and Ivory Harlow. Staff members used *Co-op Mastery*, the Center’s online cooperative educational platform, along with its companion workbook to help the students develop their cooperative’s bylaws and to begin the business planning for the cooperative.

Students can become members of the farm cooperative by paying a membership fee or by working six hours on the farm. The cooperative members can choose to be affiliated with one or more of the farm production and management committee areas, including livestock, crops, specialty products, and ag mechanics. Each committee recently elected two representatives to the cooperative board of directors to make business and management decisions for the farm.

“This will give the students hands-on experience with running a business,

particularly a cooperative, and serving on a board of directors,” said Bauman. Meanwhile, all of the student co-op members have the potential to earn money and/or receive farm products based on their personal share of the work contributed to the co-op.

Bauman explained that being a farm co-op member and working on the school farm can be part of a student’s FFA Supervised Agricultural Experience project and help them meet the qualifications to earn their State and American FFA Degrees. The student members of the cooperative keep track of their hours spent working for the farm cooperative in the FFA’s online record-keeping system. At the end of the fiscal year, if the farm makes any profit and the board decides to return a portion of the profit to the members, patronage (surplus profit) can be returned to cooperative members to share in the profits or products from the farm, based proportionally on the time invested by individual members. But first, the student-managers must make sure that adequate resources remain to keep the operation going.

“Much like real-life farming, there is no guaranteed profit,” Mr. Rhonemus told his students. There is a chance that no patronage will be returned if the board determines that there are insufficient resources to do so at the end of the

cooperative’s fiscal year. As with any farm or business operation, there is risk involved. “For our students, that primary risk is their time investment,” Mr. Rhonemus explained.

The students in the Agriculture Business Management and Ag Mechanics programs at the OVCTC have always worked on the school farm, caring for livestock and crops as well as working on equipment and performing routine maintenance. By forming a student cooperative to operate the farm, the students get to be involved on a new level. “We really do care about the management decisions we make and how that relates to the farm’s profitability, because that will determine how much each of our members financially benefit,” said junior, Kamden Crum, one of the co-op members. “It’s helping us to really see how important it is to operate our farm efficiently,” said senior, Jaycee Baldwin, another student member.

Bauman has enjoyed working with the OVCTC students and instructors. “Having students learn about the cooperative business structure, along with hands-on management of an agricultural cooperative just adds to the vast amount of practical experience the students receive in the OVCTC ag programs,” she concluded.

Family, home, career: changes abound for Jordan Maxwell

(Editor's Note: The following is the latest in a series of feature stories highlighting The Ohio State University South Centers Staff)

By Bradford Sherman
CFAES/OSU South Centers

Change can be one of life's wonderful blessings, in that it keeps things fresh and exciting.

Perhaps no one at The Ohio State University South Centers has been going through more exciting life changes lately than Jordan Maxwell. Within the past year, the 24-year-old became a first-time mom, changed jobs, moved into a new home, and now is preparing to welcome a second child into the world.

We've all gotten to know Jordan as the Program Coordinator of Aquaculture Boot Camp II (ABC), a position she is still fulfilling through the end of the year, since joining South Centers in 2016. But now, amid all the changes going on in her personal life, she is learning the ropes of a new position as a Research Assistant in the Soil, Water, and Bioenergy Program.

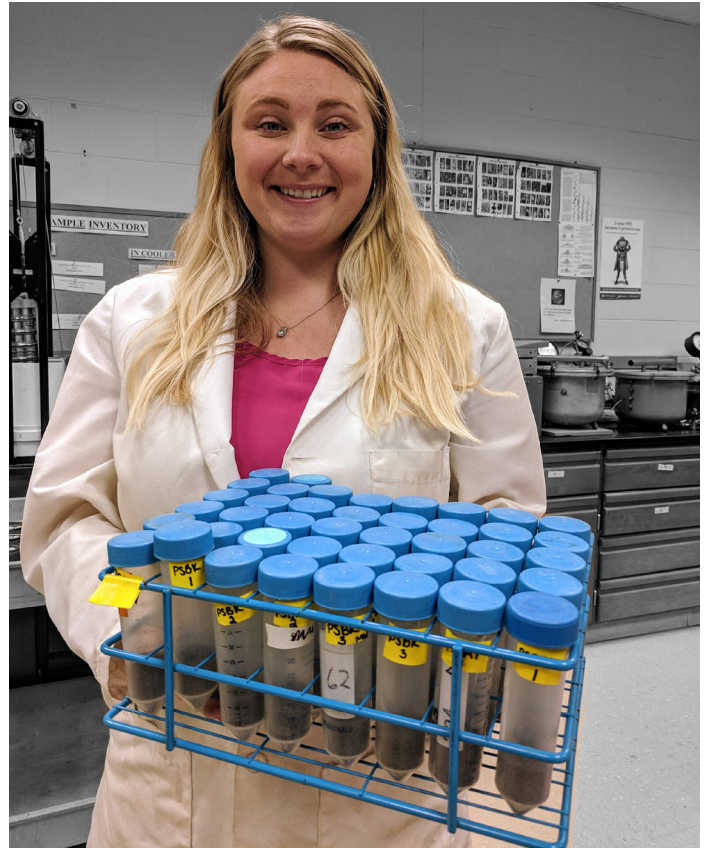
All of that is fine with Maxwell, who, in fact, credits her employment with OSU as a major catalyst for all the blessings she is experiencing right now.

"Becoming a member of The Ohio State University family here at South Centers has led to many great opportunities," she said. "It has allowed me to settle down here in the area, start a family, and now I'm blessed to be able to continue my career here in this new position."

Maxwell interviewed for her new position in July and accepted the job offer in August. This new role came along at just the right time for her, as her temporary appointment with ABC was set to expire in December.

Like the last, her new job is also a term position that will keep her with South Centers for at least another three years. She says she loves the work, the atmosphere, and the people at South Centers, and that she would someday love to move into a permanent role and someday retire as an OSU employee.

"Working here has allowed me to expand and grow, and the people that you work with really make a difference in how much you love your job. Even though my drive to work is about an hour, it doesn't seem like it at all, because I enjoy coming here and working so much."



Jordan Maxwell is pictured above working with some soil samples in the lab. The current ABC Coordinator at South Centers joined the Soil, Water, and BioEnergy program in August and will be moving into her new position after the first of the year. (Photo: Bradford Sherman/CFAES)

Before joining OSU, she worked as a fisheries technician at Apple Grove Fish Hatchery in West Virginia.

Maxwell is originally from Beavercreek, which is located near Dayton. In her free time, she enjoys being outdoors and engaging in related activities such as hunting, fishing and hiking. It was these interests that led her to pursue an education in natural resources. She earned an associate's degree from Hocking College and a bachelor's degree from the University of Rio Grande in Fish and Wildlife Management and Conservation.

It was at Rio Grande that Maxwell met her husband, Coleton, and they now reside in Cadmus at the family farm he recently inherited. They plan on raising cattle and a few crops, alongside their growing family. The couple welcomed their first child, Emersyn, in February of 2018 and are expecting a second daughter who is due to be born in February of 2019.

Business

SBDC wraps up successful 2018 fiscal year

Submitted by Brad Bapst

SBDC Director

The Ohio State University South Centers Small Business Development Center (SBDC) provides business counseling and training to a 10-county region in Southern Ohio. Primary services the SBDC provides include business planning, financial packaging and lending, marketing assistance, and goods and services exporting to other countries. The Center utilizes a unified delivery model to incorporate resources from other programs affiliated with The Ohio State University South Centers, including the Ohio Cooperative Development Center, Direct Marketing, and OSU Extension programs to strengthen service offerings.

SBDCs offer no-cost, one-on-one, long-term professional business advising, low-cost training, and other specialized services. The SBDC program is one of our nation's largest small business assistance programs within the Federal government, made up of a unique mix of SBA Federal funds, state and local governments, and private sector resources. SBDCs are often hosted by leading universities and state economic development agencies, and are funded in part through a partnership with the Small Business Administration.

The Small Business Development Center at OSU South Centers had a very successful year providing business consulting to existing and start-up small businesses in Southern Ohio. During fiscal year 2018, the SBDC at OSU South Centers provided the following assistance:

- Provided consulting to 334 clients, of which 229 received five or more hours of consulting
- Assisted with starting 25 businesses



Pictured are members of the business team at OSU South Centers. In front from left are Jennifer Dunn and Ivory Harlow. In second row are Ryan Mapes, Kelly O'Bryant, Melissa Carter, and Patrick Dengel. In back are Christopher Smalley, Mick Whitt, and Brad Bapst. (Photo: Sarah Swanson/CFAES)

- Helped clients obtain \$10,214,900 in capital
- Logged 4,323 consulting hours
- Held 19 training events with 344 attendees
- SBDC Clients created 106 new jobs and retained 532 jobs
- Recorded \$4,944,400 in general sales growth for clients

The staff at OSU South Centers SBDC continues to engage community organizations to maintain awareness of changing needs of entrepreneurs in the region and develop solutions to combat any negative impact to the economy. Counselors volunteered time to serve as board members on several chambers of commerce, on a regional board established to support

economic development, and as members of advisory boards for business organizations to increase awareness of business issues and identify solutions to problems.

The SBDC continues to work with the Southern Ohio Agricultural and Community Development Foundation in assisting area farmers interested in applying for the Ag Development Grant and the Young Farmer Grant programs. This is a program where our SBDC counselors work closely with area farmers to write business plans for projects that will be submitted to SOACDF for potential grant funding to assist with their project. This year, we assisted 33 individuals explore, complete, and submit applications for these programs. You can see details and deadlines about the program at soacdf.net.

Business

ENDEAVOR CENTER OPERATES AT FULL OCCUPANCY FOR MOST OF 2018

Submitted by Ryan Mapes
Endeavor Center Manager

The Endeavor Center operated at a 100 percent occupancy rate for most of the year. During the year we had partners graduate, but were fortunate to have new partners ready to come on board to fill the vacated offices. Partners that have joined the Endeavor Center this year include:

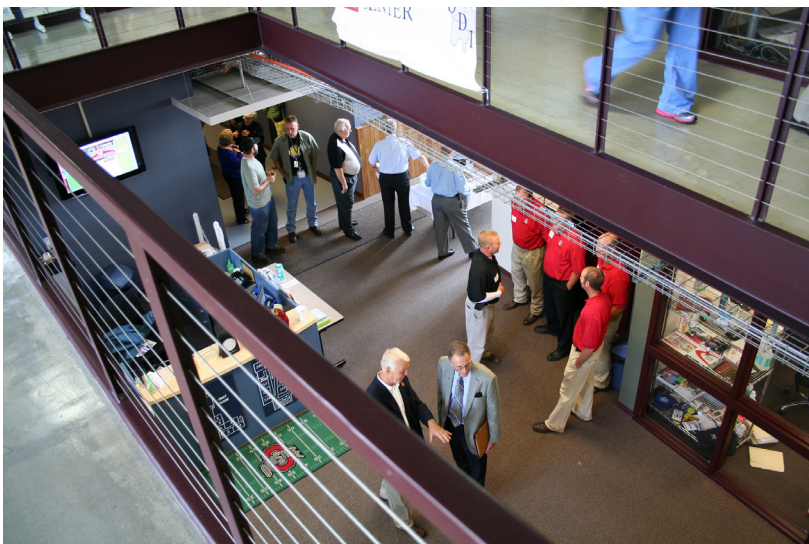
State Street Laboratories LLC – SSL operates as an independent diagnostic testing lab and a forensic toxicology testing lab in Piketon and Athens, Ohio.

Health and Wellness Bootcamp – this company helps people connect the dots between food, mental, physical, emotional and spiritual well-being.

Jenergy Consulting – Jenergy provides grant writing, proposal development, environmental consulting, project management, and master planning to local governments, non-profits, and the federal government in Appalachian regions in Ohio, Kentucky, and West Virginia.

Hoy insurance Group and Foster's Creative Capital Inc. have also joined as virtual partners. Virtual partners do not occupy a physical office, but can utilize shared work areas and the office equipment in the Endeavor Center.

There are 19 partner companies that occupy 26 office and light industrial bay spaces. We also have five virtual partners that occupy the building on a part-time basis, but do not occupy an office. Also, the training rooms are being utilized frequently by OSU programs, our partners, and outside organizations. Fluor continues to hold many off site meetings at our facility and our SBDC continues to strengthen partnerships by jointly hosting training events with local business development partners.



State Street Laboratories was one of three new businesses and two new virtual partners to join the Endeavor Center this year.

CALLING ALL SMALL FOOD PROCESSORS

By Christie Welch
Direct Food & Agricultural
Marketing Specialist

If you are a small-scale food producer, there is required documentation you will need to complete in order to be compliant with the Food Safety Modernization Act (FSMA). This includes documentation of your size exemption as a “qualified facility” and various food safety programs.

A related special workshop, intended for small (< \$1 million in sales/year) producers of fermented, canned, and other shelf-stable foods, is planned for various locations around the state. This one-day course is a hands-on opportunity for processors to develop their food safety documentation in small groups with individual coaching from instructors. Participants are encouraged to bring their existing documentation, if they have it, for review by instructors. Attendees should leave with completed or nearly completed food safety documentation for size exemptions, Good Manufacturing Practices, and Preventive Control Food Safety Plans as relevant.

LOCATIONS AND DATES:

- Columbus on December 13, 2018
- Athens on January 7, 2019
- Bowling Green on January 10, 2019
- Dayton on January 15, 2019
- Cleveland on January 29, 2019

TIME: Each location has its own time-frame. For more information and to register go to go.osu.edu/valueadded-foodsafety2018-2019

COST: \$25.00 per person

This workshop is being offered through support of The OSU Connect & Collaborate Grant, CFAES Department of Food Science and Food Industry Center, The Center for Innovative Food Technology (CIFT), Appalachian Center for Economic Networks (ACEnet), and The OSU South Centers Direct Food & Agricultural Marketing Program.



Dr. Tim Woods (far right) of the University of Kentucky, Department of Agricultural Economics, and creator of the MarketReady program is pictured along with Ukrainian scholars, producers, and Ohio State University personnel during a training aimed at sharing best practices and exploring various marketing channels.

DIRECT FOOD & AGRICULTURAL MARKETING TEAM ASSIST LOCAL FOOD PRODUCERS BECOME MARKETREADY

By Christie Welch
Direct Food & Agricultural
Marketing Specialist

Local food producers came together in Brown and Cuyahoga Counties this past month to explore new market channels for their locally produced foods. Many food producers get in to this enterprise because they really enjoy the production aspects of the business. However, there are also many local food producers whose knowledge of the various market channels is limited.

To assist these local food producers in increasing their knowledge and overcoming barriers to entering different market channels, the OSUE Direct Food & Agricultural Marketing Team partnered with local OSU Extension offices for an in-depth workshop to share best practices when exploring the various market channels.

During the MarketReady training, local foods producers learned

research-based best practices for exploring sales to restaurants, grocers, direct-to-consumers, and via wholesale markets. And while all of these market channels are seeking to purchase locally produced foods, producers must take the time to match their products, capacities, and skills with each of the market channels in order to be successful. While many are familiar with selling their products direct-to-consumers through farm and farmers' markets, there are additional opportunities to sell to restaurants, grocers, and wholesalers. Each channel requires different business functions. MarketReady provides education on these differences and how producers can be successful in developing the proper business functions for the various market channels.

The producers remarked that the training was “very informative” and they like “the different expertise of each of the speakers.”

See MARKETREADY Page 10

New Fact Sheet Available to Assist Ohio Farmers' Markets Accept SNAP Benefits

By Christie Welch

Direct Food & Agricultural Marketing Specialist

A new fact sheet has been published via Ohioline to assist Ohio's farm/farmers' markets interested in accepting Supplemental Nutrition Assistance Program benefits. SNAP is the federal food assistance program known in Ohio as the Ohio Direction Card.

These benefits allow income eligible Ohioans to purchase food for their families. In 2017, 224 Ohio farm/farmers' markets redeemed \$270,510 in SNAP benefits, a 34.6 percent increase from 2012. Even with this positive increase, there are many more markets in Ohio that could accept SNAP benefits to increase where SNAP recipients can shop for locally produced foods.

You can access the fact sheet at ohioline.osu.edu/factsheet/anr-65. If you have questions or would like additional information about accepting SNAP at your market you can contact Christie Welch, welch.183@osu.edu.



MARKETREADY

from Page 9

During the Cuyahoga County training, The Grocery's owner, Rachael Kingsbury, shared information with the participants on how she procures local foods for her business. She shared best practices that she experiences with her current suppliers. The Grocery offers locally produced foods, prepared foods, and catering services. Attendees indicated they really appreciated the "real world" examples that were shared during the trainings.

At the OSUE Brown County training, Dr. Tim Woods of the University of Kentucky, Department of Agriculture Economics and the creator of the MarketReady program, joined the group to co-present the materials and share information about the research conducted when developing the MarketReady Program. Joined by Dr. Woods was Alex Butler, also of the University of Kentucky and the Center for Crop Diversification, who shared information on insurance requirements for the various market channels.

Also in attendance in Brown County were the participants of the USDA FAS Ukraine Agricultural Economics



CFAES Center For Cooperatives Development Specialist Ivory Harlow conducts a PowerPoint presentation during a MarketReady workshop.

Faculty Exchange Program. These visiting scholars will take the knowledge gained back to their home country and adapt the program to assist their local food producers. One of the Ukrainian faculty commented, "it was nice discussing practical solutions to solve the sales

problems of farmers."

If you would like more information about the MarketReady Program, which is currently being offered in 17 states, you can go to southcenters.osu.edu/marketing/overview-programs/marketready.

International Workshop and Field Day on Climate-smart Agriculture in Ukraine



By Dr. Tom Worley
OSU South Centers Director
and Alan Sundermeier
Wood County Extension Educator

Within the framework of the Civilian Research Defense Foundation (CRDF)-funded Ukrainian-US project entitled “Impact of sustainable agricultural management practices on soil quality and crop productivity,” workshops and meetings were organized in Kherson, Ukraine as part of International Field Day “XXI century - Climate-Smart Agriculture.”

On the first day (September 11), more than 100 participants including representatives from the National Academy of Agrarian Sciences of Ukraine and the leading scientists of the Institute of Irrigated Agriculture of the National Academy of Sciences of Ukraine, the Institute of Water Problems and Land Reclamation of the National Academy of Sciences of Ukraine, “Askaniyske” and “Brylivske” farms, Kherson State Agrarian University, Mykolaiv National Agrarian University, Dnipropetrovsk State Agrarian and Economic University, Research Institute of Agriculture of the Crimea,” The Ohio State University, Ministry of Agrarian Policy and Food production of Ukraine, Kherson Regional State Administration, Kherson Branch of the State Agency of Ukraine, Kherson Branch of Soil Protection, Ukrainian Hydro-meteorological Center of the Ministry for Emergencies, heads and agronomists of farms in the southern region of Ukraine, and several participants from other countries attended.

The event took place at the Institute of Irrigated

You can find more information on OSU's involvement in research, extension and outreach activities in Ukraine by utilizing the following resources:

izpr.org.ua/index.php/novini/855-mizhnarodnij-den-polja-hhi-stolittja-chas-klimatichno-adaptovanogo-silskogo-gospodarstva-110918.html

izpr.org.ua/index.php/novini/857-prodovzhennja-mizhnarodnogo-dnja-polja-hhi-stolittja-chas-klimatichno-adaptovanogo-silskogo-gospodarstva.html

ksau.kherson.ua/news/3234-2018091301.html

igim.org.ua/?p=5073

igim.org.ua/?p=5088

youtube.com/watch?v=fCYL_hxpTKE

youtube.com/watch?v=yOCh5wVP3Qc

youtube.com/watch?v=HBKGvFsvt4E

youtube.com/watch?v=j9utY4k0GTE

youtube.com/watch?v=86wl4fsDfLM

youtube.com/watch?v=MWKnzjXfJA&t=394s

Agriculture, Naddnprjanske village, Kherson, Ukraine. Several professional presentations were delivered by scientists, farmers, agro-industry personnel, and faculty members. Drs. Rafiq Islam and Natalia Didenko presented the CRDF-funded project results based on a first-year field study on the topic of Agriculture under Climate Change in Ukraine.

More than 50 participants attended a field day and presentation on climate-smart agriculture in Ukraine; it was delivered at Askaniyske Farm (Tavrychanka village, Kakhovka district) on the second day (Sept 12th, 2018). Several professional presentations were delivered by OSU experts including Alan Sundermeier from Wood County Extension on long-term no-till, cover crops, compaction and soil health; and Dr. Tom Worley on economics of crop production with no-till.

After the professional presentation session, the participants visited our research and cover crops site. Several demonstrations on equipment, cover crops, on-site soil quality evaluation, and use of drones to monitor crop growth and disease pressures were performed.



Saying ‘so long’ to Sergiy

Soil, Water, and Bioenergy Resources Program hosts CRDF-sponsored visiting scholar from Ukraine, Sergiy Lavrenko

By Dr. Rafiq Islam

Soil, Water, & BioEnergy Program Leader

Dr. Sergiy Lavrenko, an assistant professor with the Department of Agriculture, Faculty of Agronomy at Kherson State Agricultural University in Kherson, Ukraine has completed his two-month fellowship in our Soil, Water, and Bioenergy Resources Program at The Ohio State University.

He came to South Centers as one of the visiting scholars sponsored by the Civilian Research Defense Foundation-Ohio State University US-Ukraine Competitive Research Program for his professional development to teach and conduct research and disseminate information on climate-smart agriculture.

During his two-month fellowship period at The Ohio State University, he played a significant role in our program’s teaching, research, and Extension activities. He was actively involved in lab and field research and learned several new techniques to collect, process, and analyze biological, chemical, and physical indicators of soil quality associated with enhanced ecosystem services under climate-smart agriculture.

He is a very responsible and highly motivated individual who worked hard to fulfill his training program goal. We were very impressed with his research work and educational activities.



OHIO STATE UNIVERSITY ONE HEALTH DAY SYMPOSIUM 2018

By Dr. Rafiq Islam

Soil, Water, & BioEnergy Program Leader

Dr. Rafiq Islam attended and delivered a presentation entitled “Rethinking Agriculture in the 21st Century: Growing Healthy Food with One Health Vision” at the Plenary Session of the Ohio One Health Symposium, which was held at Drake Performance and Event Center on the campus of The Ohio State University in Columbus on November 1-2.

The symposium was sponsored by The Global One Health initiative (GOHi) with donations from Centers for Disease Control and Prevention (CDC), OSU Infectious Diseases Institute (IDI), National Institutes of Health (NIH), Ohio State University Extension, and One World, One Health.

One Health Day, celebrated annually on November 3, is an international campaign co-coordinated by the One Health Commission, the One Health Initiative, and the One Health Platform Foundation. The goal of One Health Day is to bring attention around the world to the



need for One Health interactions and for the world to see them in action. The One Health Day campaign is designed to engage as many individuals as possible from as many arenas as possible in One Health education and awareness events, and to generate an inspiring array of projects worldwide.

The One Health Day Symposium brought together multiple disciplines working locally, nationally, and globally to address the spread of disease, promote health, and emphasize the connection among humans, animals, and the environment.



Applied Research and Extension Outreach in Northeast China

By Dr. Rafiq Islam

*Soil, Water, & BioEnergy
Program Leader*

The Ohio State University is actively involved in capacity building of the research, education, and Extension activities at the Heilongjiang Academy of Agricultural Sciences-Jiamusi located in the Peoples Republic of China.

Dr. Rafiq Islam and Ken Ford (Fayette County Extension Educator) from The Ohio State University; Drs. Ismail Dweikat and Oscar Rodriguez from University of Nebraska-Lincoln; and Drs. Sougata Bardhan and Safiullah Pathan from University of Missouri

and Lincoln University-Missouri visited China at the invitation of the Heilongjiang Academy of Agricultural Sciences during August-October of 2018.

Dr. Islam led the visit. All of the experts from the United States delivered professional presentations on climate change and crop productivity, corn and soybean breeding, soil amendments, bio-fertilization, and Extension outreach activities.

Based on their acquired experience with Chinese agricultural management practices, Dr. Islam and others have developed an applied research and Extension outreach coordination

with scientists at the Heilongjiang Provincial Academy of Agricultural Sciences-Jiamusi Branch in 2014. As a part of their effort, they have established a long-term applied research project entitled "Tillage and Cropping Systems Impact on Soil health and Agroecosystem Services."

Several of the OSU Extension Educators, scientists, and faculty members visited the Chinese academy to further strengthen the bridge of collaboration. Likewise, several exchange scientists and students from the Chinese academy visited The Ohio State University to acquire science-based knowledge on 21st century climate-smart agriculture.

GRAPE & WINE ANALYSIS WORKSHOP COMING TO SOUTH CENTERS DEC. 19

By Bradford Sherman

CFAES/OSU South Centers

Need a break from the hustle and bustle of the holiday season? Then consider spending a relaxing and educational day at The Ohio State University South Centers learning the art of wine grape growing and wine production.

OSU South Centers will host a Grape and Wine Analysis Workshop from 9:30 a.m. until 3:30 p.m. Wednesday, December 19. This daytime educational opportunity will feature Dr. Gary Gao, Associate Professor and Extension Specialist, and Research Assistant Ryan Slaughter, along with several expert guest presenters.

The cost of the workshop is \$25 per person and includes a lunch. You must preregister by Friday, December 14 by calling Program Assistant Bradford Sherman at 740-289-2071 ext. 115 or by emailing your registration information to sherman.1473@osu.edu.

"We have been running this very popular program for quite a few years now," said Gao. "Attendees will learn the basics of wine grape growing and winemaking techniques." Gao added that those who take part in this program will learn proven grape growing techniques, acquire basic tools to successfully manage a vineyard, and come away with a better understanding of how to get started in the wine business.

The impact that grape growing and wine making has on the economy of Ohio is around \$1.3 billion each year. According to data from a 2016 economic impact study, Ohio is the 6th largest wine and 9th largest grape-producing state with a retail value of \$61 million in wine sold. The



The Ohio State University South Centers in Piketon will host a Grape and Wine Analysis Workshop on December 19 from 9:30 a.m. until 3:30 p.m. The cost is \$25 per person and interested persons need to register by December 14 in order to attend.

Buckeye State has 265 wineries that employ 8,067 full-time workers who produce nearly six million gallons of wine annually.

Whether you are an established grower or wine maker, or are just interested in getting started in this important economical industry, this workshop will provide valuable information for you to take back to your operation. Topics covered will include a 2018 vintage overview, vineyard soil and tissue analysis, assessing vine balance, sulfur dioxide management in the cellar, new and existing varieties for quality wine production, and essential issues in fermentation management. Attendees over the age of 21 will also have the opportunity to sample some of the wines made from new and existing wine cultivars.

Presenting these topics will

be experts from the Ohio State University Department of Horticulture Crop Science. Scheduled for the workshop are Enology Program Manager Todd Steiner, Viticulture Outreach Specialist Dr. Maria Smith, Research Associate Dr. Lisa Dunlap, and Enology Lab Manager Patrick Pierquet.

"Our speakers all have extensive training and experience in either grape growing or wine making or both," explained Gao. "Attendees will also get to see our research and demonstration vineyards at OSU South Centers, and check out some of our analytical tools for fruit or wine analysis."

OSU South Centers is located at 1864 Shyville Road in Piketon. Attendees should enter the Research and Extension Building upon arrival.

RECENT PUBLICATIONS

A look at recently published work originating from OSU South Centers

Effects of Temperature on the Expression of Two Ovarian Differentiation-Related Genes *foxl2* and *cyp19a1a*

Zhi-Gang Shen, Nour Eissa, Hong Yao, Zhi-Gang Xie and Han-Ping Wang*

Exposure to stress induces a series of responses and influences a wide range of biological processes including sex differentiation in fish. The present work investigated the molecular and physiological response to thermal stress throughout the early development stage covering the whole period of sex differentiation of bluegill, *Lepomis macrochirus*. Larvae were treated using three temperatures, 17, 24, and 32°C from 6 to 90 days posthatching (dph) in 30-L round tanks. There is no significant difference of the sex ratio and survival among the three temperature groups in the geographic population used in this study. Two ovarian differentiation-related genes *foxl2* and *cyp19a1a* were detected at 7 dph suggesting that these genes have already played a role prior to sex differentiation. The expression of *foxl2* reached the peak and was thermosensitive just prior to the onset of ovarian differentiation at 27 dph. Histological examination displayed that the proliferation of germ cells and ovarian differentiation were delayed at the low-temperature treatment (17°C) at 97 dph compared with higher temperatures. In conclusion, the water temperature regulates the sex differentiation of bluegill through modulation of the expression of *foxl2* and *cyp19a1a*. A comparative study of the expression profile of sex differentiation-related genes in species will shed light on the evolution of sex-determination mechanisms and the impact of stress on sex differentiation.



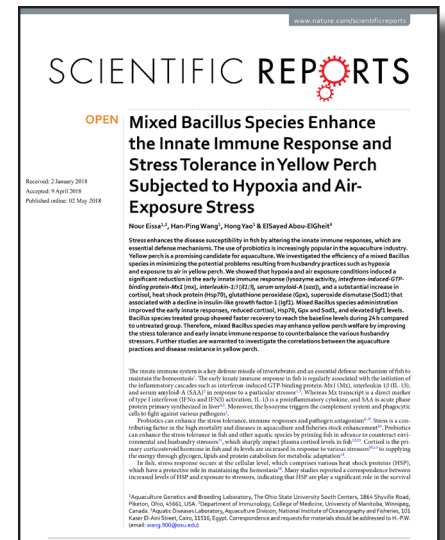
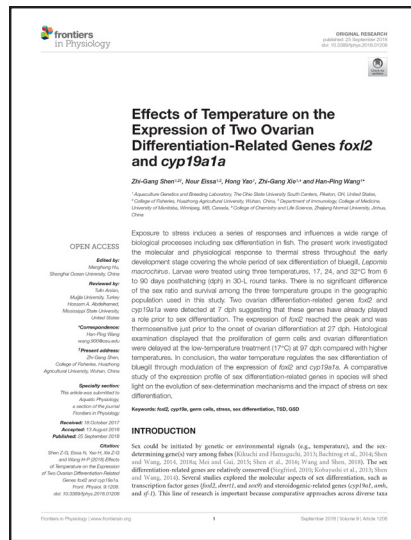
Frontier in Physiology, 2018.

Mixed *Bacillus* Species Enhance the Innate Immune Response and Stress Tolerance in Yellow Perch Subjected to Hypoxia and Air Exposure Stress

Nour Eissa, Han-Ping Wang*, Hong Yao, and ElSayed Abou-ElGheit

Stress enhances the disease susceptibility in fish by altering the innate immune responses, which are essential defense mechanisms. The use of probiotics is increasingly popular in the aquaculture industry. Yellow perch is a promising candidate for aquaculture. We investigated the efficiency of a mixed *Bacillus* species in minimizing the potential problems resulting from husbandry practices such as hypoxia and exposure to air in yellow perch. We showed that hypoxia and air exposure conditions induced a significant reduction in the early innate immune response (lysozyme activity, interferon-induced GTP-binding protein [Irf1], interleukin-1 β [il1 β], serum amyloid-A [saa], and elevated light levels). Mixed *Bacillus* species administration improved the early innate responses, reduced cortisol, Hsp70, Gpx and Sod1, and elevated Irf1 levels. *Bacillus* species treated group showed faster recovery to reach the baseline levels during hypoxia compared to untreated group. Therefore, mixed *Bacillus* species may enhance yellow perch welfare by improving the stress tolerance and early innate immune response to counterbalance the various husbandry stressors. Further studies are warranted to investigate the correlations between the aquaculture practices and disease resistance in yellow perch.

Scientific Reports, 2018



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



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.

