OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
OHIO STATE UNIVERSITY EXTENSION

Connections Newsletter

The Ohio State University South Centers, Piketon Ohio Winter | 2016

Michael Jones and Charlotte Graham of Great River Organics show off some of the cooperative's new marketing materials made possible through an OCDC Seed Grant. (photo by Kim Roush)

OCDC moves new and emerging cooperatives forward

By Hannah Scott, OCDC Program Manager

It has been quite a year at the Ohio Cooperative Development Center! The OCDC saw some exciting developments in 2015 and is poised to continue supporting rural economic development throughout Ohio and West Virginia in 2016.

As a co-op development center, OCDC's main focus is on providing technical assistance to new and emerging cooperative businesses in the region. This assistance often comes in the form of one-on-one meetings with OCDC staff, who help groups explore the cooperative model, work with them through the cooperative formation process, assist with board training and development, and much more. In 2015, OCDC staff assisted over 35 cooperatives and cooperative projects across the region! (*continued on page 2*)

OCDC moves new... *(continued)*

Many of these new and emerging cooperatives will now help their members address a wide variety of problems or opportunities. For instance, the Greenfield Farmers' Market Co-op now provides a member-owned and governed outlet for local farmers to market their products, while the All Things Food Co-op allows the community ownership of their food through a cooperative local foods store and the Minutemen Farmers' Cooperative is gearing up to provide farmer training to local veterans.

OCDC's Seed Grant Program was also a valuable resource for cooperative development in the region last year, providing funds for new and emerging cooperatives to form and grow their businesses. The 2014-2015 program, which operated from October 2014 through September 2015, provided over $18,000 to nine projects. The 2015-2016 program started with a bang in the final quarter of 2015, accepting a record number of proposals from projects across the region. OCDC staff were excited to award approximately $12,000 to these projects at the end of December and will be working with awardees as they complete their projects in the new year.

Tom McConnell of the WVU Extension Service Small Farm Center addresses participants at a meeting of the Ohio and West Virginia Food Hub Network. (photo by Hannah Scott)

Finally, one of OCDC's signature programs, the Ohio and West Virginia Food Hub Network brought together food hub and training farm managers and developers, along with technical assistance and service providers, for peer exchange and education four times in 2015. Approximately 20 hub businesses and service providers from the U.S. Department of Agriculture, OSU Extension, West Virginia University Extension, Marshall University, and many others learned about food hub case studies and models, financial resources, value-chain connections, and more! The network will continue to address barriers to food development in 2016.

Welcome to OSU South Centers Vinayak Shedekar!

Vinayak Shedekar recently joined the Soil, Water and BioEnergy program as Research Associate II. He obtained his undergraduate and Masters' degree in Agricultural Engineering from India, and is about to complete his doctoral degree from the Department of Food, Agricultural, and Biological Engineering at Ohio State University.

Vinayak's primary area of work is agricultural soil and water management. His professional skills involve GPS surveying, GIS-based database management, and field monitoring techniques, as well as programing and modeling of agro-ecosystems. He has more than 12 years of research experience in water management, hydrologic and water quality modeling, and soil health assessment. He has also been involved with teaching undergraduate and graduate level classes at OSU, and Extension activities such as the Overholt Drainage School, Conservation Tillage and Technology Conference, and several soil health and sustainable agriculture workshops.

As a Research Associate, Vinayak will be actively involved in the research, education and Extension activities of the Soil, Water and BioEnergy program. His primary responsibilities will consist of managing the field research and using different techniques to collect, process and analyze soil, water and plant samples related to agroecosystem services. He will also help manage externally-funded grants, mentor exchange graduate students, and supervise lab and field researchers.

Vinayak is a diehard Buckeye fan and enjoys watching sports, especially football and basketball!

Tweaking our research and demonstration vineyards to help grape growers produce wine grapes in southern Ohio and beyond

One of the wines at the Commercial Wine and Grape Workshop held at OSU South Centers. (photo by Ryan Slaughter)

By: Gary Gao, Ph.D. Extension Horticulturist and Associate Professor and Ryan Slaughter, Research Assistant

The unpredictable weather patterns during the last 2-3 years have been very challenging to the fruit industry in Ohio. Grape growing is no exception. Extreme cold temperatures during the "polar vortexes" in 2014 and 2015 killed a significant percentage of grapevines and drastically decreased fruit production in Ohio and throughout the Midwest. We are actively looking for ways to help grape growers deal with such weather related challenges.

Testing cold hardy grape cultivars in our Piketon vineyard is one way. We planted several super cold hardy varieties from Minnesota in 2015. We will soon add two more from Minnesota and one from Cornell University. The new cultivars that we will be adding to our vineyards are Aromella (Cornell), La Crescent (MN), and Marquette (MN). According to Dr. Bruce Reisch and his colleagues at Cornell University, Aromella is a winter-hardy white wine grape with high potential productivity and excellent aromatic muscat wine characteristics. Follow this link http://cornell.flintbox.com/public/filedownload/4732/Cornell%20grape%20Aromella%20flyer for more information on the Aromella variety. Follow this link http://viticulture.hort.iastate.edu/cultivars/La%20Crescent.pdf for more information on La Crescent. Information on the Marquette grape variety is available here: http://viticulture.hort.iastate.edu/cultivars/Marquette.pdf

We will also be installing a high tunnel for wine grape production research. Growing grapes in high tunnels is not necessarily a brand new concept. Follow this link http://www.winesandvines.com/template.cfm?section=features&content=111842 for more information on this subject. Wine grape production in high tunnels can make sense on a small scale, especially if growing grapes for estate wines. We will use an old high tunnel for this project. The cultivars we will test are Cabernet Franc and Regent. Hopefully, this small demonstration vineyard will yield big findings!

We would like to extend our sincere appreciation for a grant from the Ohio Grape Industry Program. Follow this link http://www.tasteohiowines.com/ for more information on Ohio wines. We look forward to seeing many of you at our workshops and field nights at OSU South Centers in Piketon!

Endeavor Center accomplishments

By: Ryan Mapes, OSU - Endeavor Center Manager

The OSU Endeavor Center manager and staff of the affiliated programs at the Ohio State University South Centers continually engage community organizations to maintain awareness of changing needs in the regional entrepreneurial ecosystem and develop solutions to combat negative impact to the economy while promoting the resources and talents of those in the region. 2015 was once again a successful year for the Ohio State University Endeavor Center, its programs and its partners. Open since 2005, the 27,000 square foot mixed-used business incubator has come to be recognized as a community leader in economic development, business training, and technological excellence.

Endeavor Center business programs and partners had another successful year. The technical assistance programs affiliated with or housed within the Endeavor Center include a Small Business Development Center, an International Trade Assistance Center, a Manufacturing and Technology Small Business Development Center, and the Ohio Cooperative Development Center. All of these programs provide technical expertise and guidance to the small businesses housed in the incubator. Several partners carried out work on several projects at the Portsmouth Gaseous Diffusion facility. The facility housed 18 individual businesses which filled 27 office spaces throughout the year and had the center operating at close to 100 percent of its occupancy capability. In the last five years of operation, The Ohio State University Endeavor Center and its business partners have:

- Created more than 1300, high-skill, high-wage jobs, adding more than 115 million dollars of direct economic activity to the local community.

- In cooperation with the Small Business Development Center of Ohio, sponsored or conducted 320 business workshops, training sessions and seminars with nearly 5,300 attendees – business owners, prospective entrepreneurs and ambitious employees seeking to improve the profitability of their businesses so they can grow and provide additional employment opportunities in the community.

A highlight of the year occurred in October when The OSU South Centers and the Endeavor Center hosted a visit from the Michael Drake, President of The Ohio State University, Bruce McPheron, Dean of the College of Food, Agricultural, and Environmnental Sciences, faculty members, students and BRUTUS BUCKEYE! The meet and greet lunch included various community leaders and Endeavor Center partners. The trip showcased many businesses currently housed at the Endeavor Center and/or businesses that have received assistance from one of our business programs.

OSU genetically improved perch. (photo by Kenneth Chamberlain)

Aquaculture research achievements and impacts 2015

By Dr. Hanping Wang, Senior Scientist

Summary of Achievements: In 2015, in collaborations with the Oregon State University, University of Wisconsin-Stevens Point, Lincoln University of Missouri, University of Benha University, and several other international institutions, we accomplished twelve research studies and projects resulting in 12 manuscripts being submitted; we finished the 3-year on-farm on-station tests of improved yellow perch vs. local unimproved fish, and finalized the report; we published five peer-reviewed journal articles and six proceedings abstracts; received two grants; trained five graduate students, post-doctoral fellows and scholars; completed/submitted seven new grant proposals; and made eight presentations at international conferences. A book titled Sex-Control in Aquaculture is in the progress.

Yellow Perch Breeding: The fifth generation of fast-growing lines of yellow perch was created for the aquaculture industry through marker-assisted cohort selection. Approximately 1,000,000 genetically improved seeds were delivered to the aquaculture industry in 2015 and so far over 2,000,000 genetically improved seeds have been distributed to farms for test and demonstration. Neo-male male populations of yellow perch with a female genotype have been created, and a fast-growing all-female strain has been developed for the aquaculture industry by crossing neo-males with regular females. The all-female population should be able to grow 50% faster than unimproved regular mixed populations. Four projects related to sex-control and breeding were completed and four manuscripts on these projects are in preparation or in revision.

Bluegill Breeding: Twenty-four selected and improved females and 24 selected males were pair-mated, and 12 batches of expected all-males were produced. Once the sex is confirmed, the fish will be distributed to two locations and to compare sex ratios and production characteristics. Temperature effects on sex ratio have been found in some geographic populations, producing more males in high temperatures, more females in low temperatures. The findings were published in Aquaculture. Follow-up investigation using four different geographic populations strongly suggests that both temperature-dependent sex determination and genetic sex determination exist in bluegill. *(continued on page 6)*

Aquaculture research achievements and impacts 2015 (continued)

This paper is in the revising phase and being considered by The Biological Bulletin for publication. The results from these two experiments provide a valuable base for developing all-male broodstock for bluegill, which could grow 35-50% faster than mixed populations.

Identify the best genetically distinct largemouth bass populations for the industry: We investigated the genetic structure of largemouth bass from 20 wild populations and five cultured stocks across the United States and China using eight microsatellite loci. Our major findings are as follows: (1) Allelic richness was lower among cultured populations than among wild populations; (2) Effective population size in hatcheries could promote high levels of genetic variation among individuals and minimize loss of genetic diversity; (3) The majority of largemouth bass populations had a significant heterozygosity excess, which is likely to indicate a previous population bottleneck; (4) The phylogeny based on eight microsatellites revealed a clear distinction between northern and southern populations. The information provides a valuable basis for development of aquaculture genetic breeding programs in largemouth bass.

On-farm and on-station tests of improved yellow perch in ponds: A 3-year project of the on-station and on-farm tests of genetically improved yellow perch on three sites and in two states was finished, data analyzed, and report submitted. This is an important step for Commercialization of genetically improved strains. The testing results showed improved fish exhibited 27.6% - 42.1% higher production, and 25.5% - 37.5% higher growth rates, while having 12.3% - 27.8% higher survival than local strains, on the average, across the three sites.

Genomic sequence and tool development: In collaboration with Oregon State University, we completed RAD/DNA sequencing of five strains, and whole genome sequencing of two strains in yellow perch to develop SNPs and identify genomic diversity of those strains for further improve perch growth and other economic traits; we completed RNA sequencing of regular males, regular females and neo-males, and different growth phases of yellow perch to identify genes associated with sexual size dimorphism and sex determination, and to develop an all-female population using improved fish; a total of 41,479 microsatellite markers were identified from 18,210 unigene sequences for breeding programs; we also completed whole genome sequencing of two strains of bluegill to develop SNPs and investigate genomic base of sex determination for developing mono-sex population. In addition, we completed RAD/DNA sequencing of white and black crappie to develop SNPs and identify genomic diversity of those species for a future crappie and sunfish breeding program.

Improvement of egg hatching rate for industry: We completed a project on determining efficacy of formalin, iodine, and sodium chloride for the improvement of egg hatching rate and fry survival prior to the onset of exogenous feeding in yellow perch. The study revealed that formalin was a more effective disinfectant to improve the hatching rate and survival to first feeding fry of yellow perch than iodine and sodium chloride. To improve the hatching rate, a concentration of 150 to 250 mg L-1 for 30 min is recommended to disinfect the eggs of yellow perch daily from the beginning to the eyed stage. The results were published in Aquaculture Research and will be used by fish farmers to improve the egg hatching rate and fry production of yellow perch.

Improvement of perch fry survival rate for industry: Seven feeding regimes were tested in 2015, with each having two replicates, via combination of mouth-opening prey, initial age of weaning, duration of weaning, duration of co-feeding, and different larvae formula feed. Several related studies were completed: 1) By monitoring egg size produced by different strains/families, we have identified some strains/families that produced significantly larger-mouth gape progeny and larger eggs than others; 2) Variation of egg size is dramatically different among strains of our genetically improved fish, indicating there is a large range of selection for large eggs; 3) We found predation and ingestion of prey at the beginning of feeding is limited by the mouth gape in fish larvae which determine larvae survival. Survival varied considerably between replicates and among feeding regimes. Massive mortality was observed at two stages for all feeding regimes/tanks. *(continued on page 7)*

Aquaculture research achievements and impacts 2015 (continued)

The first massive mortality was observed right after stocking from the hatching tank to nursing tank. About 30-75% larvae died the next day after stocking due to handling. The second massive mortality was observed from 10- to 30-days post-hatch (DPH) of fry. No mortality was found after 45 DPH and all fish could ingest commercial starter feed (>0.8 mm) for larvae.

International training program: Leading research in aquaculture genetics and breeding at the OSU South Centers has attracted more than twenty-five scientists and international scholars to work in the Aquaculture Research Center and Genetics Lab at Piketon. In 2015, the lab trained five visiting Ph.D. students, post-doctorial researchers and international scholars, and one of them received their Ph.D in 2015. They also significantly contributed to the aquaculture program's success at The Ohio State University South Centers.

Sustainable agriculture and agroecosystem services

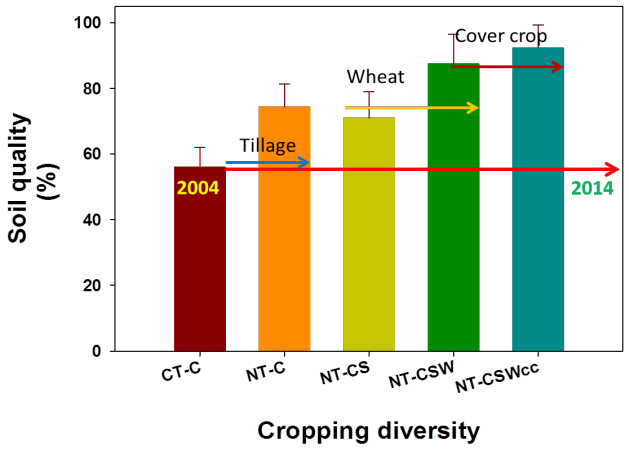
By: Rafiq Islam, PhD, Soil and Water Specialist

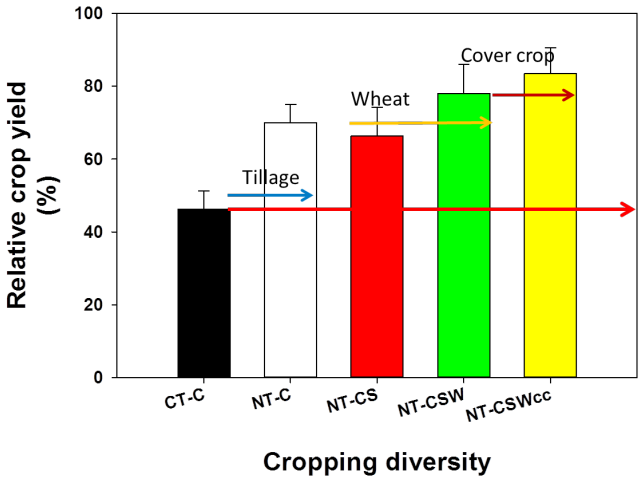
Sustainable agricultural practices based on increasing cropping diversity with cover crops act as a biological primer to improve functional stability of continuous no-till (NT) with enhanced agroecosystem services. We presented the results of our long-term effects (2004 to 2014) of sustainable agriculture based on continuous corn, corn-soybean (CS) and corn-soybean-wheat (CSW) rotations with or without cover crops (CC) on soil health and crop productivity under NT in the session on "Soil Health Research for Agroecosystems" at the American Society of Agronomy/Crop Science Society of America/Soil Science Society of America International Meetings in Minneapolis, MN, in November 2015. We were invited to present our long-term experimental results on Sustainable Agriculture and Agroecosystem Services as they related to the tri-society international meeting theme of "Synergy in Science: Partnering for Solutions."

To account for the impact of sustainable agricultural practices on soil health, economic crop yields, and agroecosystem services, our research team members (Wayne Lewis, Yogi Raut, Hasni Jahan, Stacey Reno, Emily Weaks, and Drs. Celal Yucel, Derya Yucel, Kenan, Barik, and Ekrem Aksakal) collected composite soil and plant samples over the years from geo-referenced sites of each replicated plot.

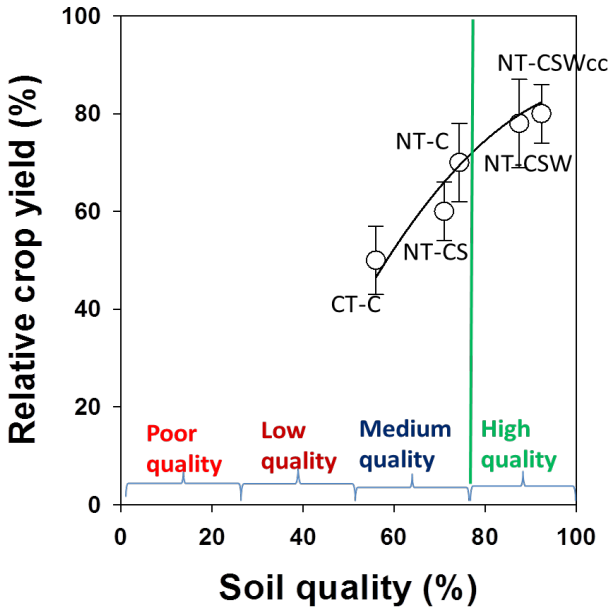
The soil samples were analyzed for microbial biomass, basal respiration, metabolic quotients, enzyme activity and earthworms (as biological soil health indicators); total organic carbon and nitrogen, active carbon and nitrogen, and greenhouse gas emissions (as chemical soil health indicators); and particulate organic C and N, bulk density, aggregate size distribution, and macro-aggregate stability (as physical soil health indicators). Corn, soybean, and wheat yield data were collected and normalized as relative crop yields. The soil and crop data were normalized to calculate soil health, based on both inductive and deductive approaches. Data normalization was performed based on the premise that higher values of soil and crop yield data are better indicators of soil health, except for compaction and greenhouse gas emissions.
(continued on page 8)

Sustainable agriculture and agroecosystem services *(continued)*





Our results showed that low external input with increasing cropping diversity under a continuous no-till system significantly improved soil health with an increase in economic crop yields over the annual plowed cropping conventional tillage system. The impact of increasing cropping diversity was more pronounced with wheat and cover crops under continuous no-till. Soil biological health indicators were found more sensitive than soil chemical and physical health indicators. We observed that when switching to continuous no-till crop rotation, it is essential to use multi-functional cover crops to improve soil health for higher crop yields. We found the improvement in crop yields lagged behind improvements in soil health.



SBDC success

Ohio Small Business Development Centers

By: Ryan Mapes, OSU - Endeavor Center Manager

The Ohio State University South Centers Small Business Development Center (SBDC) is a nine-person team including a Regional Director, a manufacturing specialist, an international trade assistance specialist, four business counselors and two program assistants. The District 7 SBDC 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.

In 2015 the OSU South Centers SBDC provided 4,463 one-on-one consulting hours to entrepreneurs and existing businesses in the region. As a result, the clients started 27 new businesses, obtained $24,502,381 in loans and other capital, helped create 328 jobs and increased sales by nearly $32,214,000. *(continued on page 9)*

SBDC success *(continued)*

The SBDC also provided 30 training sessions with 608 attendees. Training topics included general business management and growth principles, Microsoft Office products and social media outlets.

Individual Counselors are recognized each year at the Statewide SBDC conference for extraordinary efforts given throughout the year. These Peer Recognition Awards are voted on by all counselors around the state. All levels of field staff are eligible for nomination and there are five categories of awards: advocacy, collaboration, innovation, marketing, and mentoring. This year two of our counselors brought home individual awards. Patrick Dengel won the collaboration award and Melissa Carter won the marketing award.

Regional partnerships are the primary source of referrals for the District 7 SBDC. The South Centers maintains formal agreements with three local universities for regional economic development collaboration. The SBDC also utilized formal Memorandums of Understanding with the Southern Ohio Procurement Outreach Center, the district's PTAC, and Pike County Community Action. These relationships help the region's entrepreneurs, business owners and small manufacturers with technical assistance and training.

The OSU South Centers SBDC Center also participated in multiple entrepreneurial focused events throughout the year such as: Lumber Grading School, Business Blog Talk, From Dream to Reality, and the SOACDF Tobacco Diversification Initiative.

Lumber Grading School Over a dozen loggers from Ohio and abroad gathered at OSU South Centers June 29 through Jule 3 to participate in a course designed to give them a better understanding and develop their skills in the timber industry. The five-day Lumber Grading Short Course/Flex Day Course was instructed by a National Hardwood Lumber Association National Inspector. The OSU South Centers Business Development Network worked with Appalachian Partnership for Economic Growth to provide reimbursement through the Make It In America workforce development grant to cover the costs of the training for companies sending employees to the Lumber Grading School..

Business Blog Talk is a weekly podcast that incorporates business resources and highlights entrepreneurial successes in our region. In partnership with the University of Rio Grande, this program has now expanded into weekly television broadcasts. This is a unique and innovative approach to communicate with our clients and partners about the services available and to share success stories that help market the businesses of OSU South Center's clients.

From Dream to Reality is a five-week course that meets twice a week and is designed to provide an opportunity to learn a variety of skills needed to own and operate a business. This course is offered two times per year through a partnership with the Pike Community Action Agency.

Tobacco Diversification Initiative is an annual program for agribusiness and next generation farmers in the 22-county area served by the Southern Ohio Agricultural and Community Development Foundation to diversify from tobacco production into a profitable venture.

The staff of The 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.

MarketMaker links producers and potential buyers

By: Charissa Gardner, Program Assistant

There are nearly 8,000 farmers markets in the U.S., an increase of more than 150 percent since 2000. Direct-to-consumer agriculture sales produce $1.2 billion in annual revenues. To be successful in your agricultural business, it is important to have a good marketing plan. The Ohio State University South Centers leads Ohio's Direct Agricultural Marketing program and has offers producers resources and educational opportunities to assist with their direct agricultural marketing plans.

Launched in 2008, one very important resource is Ohio MarketMaker which currently hosts one of the most extensive collections of searchable food industry-related data in the country. The web-based program contains demographic, food consumption, and business data that users can search to find products to buy, or find a place to sell their products.

MarketMaker currently links producers and consumers in 19 states plus the District of Columbia. As the exclusive licensee, Riverside Research plans to invest in additional research and development to expand MarketMaker's capabilities to new markets and regions, both nationally and globally. States that are currently participating include: Alabama, Arkansas, Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Mississippi, Nebraska, New York, Ohio, Pennsylvania, South Carolina, Texas, Wyoming, and Washington, D.C..

At the beginning of 2014, MarketMaker had almost 700,000 businesses nationwide in categories of AgTourism, Farmers/Ranchers, Fisheries, Farmers Markets, Wineries, Eating & Drinking, Wholesalers, Food Retailers, and Food Banks, as well as other businesses not falling into those categories. In 2013, users posted 442 advertisements in the Buy & Sell Forum which were viewed over 36,000 times.

If you don't have an online profile, you can set one up in less than 10 minutes at www.ohiomarketmaker.com. There is no fee to register; it is totally free to both consumers and producers. Your profile is easy to maintain and manage, and allows you to connect with local, state, and national customers and buyers. Some of the features available are: indicating which farmers' markets you'll be participating in, which restaurants you sell to, which grocery stores carry your products and your affiliation with local food organizations.

MarketMaker has several unique features that allow the consumers and producers to present themselves to other MarketMaker users. Using the business connection feature, market managers, consumers and producers can link with one another and other organizations that have also developed MarketMaker profiles, including grocery stores, restaurants, and schools. The link serves the mutual benefit of identifying users of local food sources. Businesses you connect with on MarketMaker appear on your business's detail page to let users know more about your operation. You may want to connect with a variety of businesses, including: retailers or farmers' markets that carry your product, businesses where you source product, and other local food businesses.

Another unique feature is that buyers and sellers can select their current industry affiliations. These affiliations help to build credibility with customers. Some of these could include: Ohio Proud, CIFT, Ohio Grocers Association, and others.

In today's world, social networking plays a huge factor in marketing. MarketMaker also has the feature of connecting your Facebook and Twitter social links to your profile. Connecting your profile to these sites helps to build your audience and customer base while networking with others in the industry.

Farmers markets may also create a profile in MarketMaker. Farmers market managers can easily create profiles with location, web site, contact information and produce available. The advanced directional mapping tools allows customers to easily find the market and view the types of products that the market has for sale. *(continued on page 11)*

MarketMaker links producers and potential buyers *(continued)*

This feature brings buyers to the market, and saves the buyers time on locating the products they need.

MarketMaker is supported by several state and national sponsors. These sponsors are the USDA, Farm Credit, Ohio Wines, Ohio Farm Bureau, the Agricultural Marketing Resource Center, and the Ohio State University.
For further information on Ohio MarketMaker or Direct Agricultural Marketing, visit the following Ohio State University Direct Marketing web site at http://southcenters.osu.edu/marketing/overview-programs/marketmaker. If you would like to be added to the Ohio Direct Marketing list serve to receive direct marketing updates and educational opportunities, contact OSU Direct Marketing Team leader, Christie Welch or Ohio MarketMaker Program Coordinator, Charissa Gardner or call the OSU South Centers 1-800-860-7232 or 740-289-3727 ext. 132.

MarketMaker is a national food marketing program available to producers.

Busy Year for the Direct Agricultural Marketing Team

By: Christie Welch, Direct Agricultural Marketing Specialist

The OSU Extension Direct Agricultural Marketing Team is busy providing information and education to Ohio's direct marketers. Team members have been active presenting at conferences throughout the state. Topics include branding your farm market, pricing for profit, using social media, and more. If you have missed these presentations, you can still access our direct marketing information through webinars the team offers monthly. The webinars cover a variety of topics to assist direct ag marketers to increase their knowledge, learn best marketing practices, and provides tips and tools to help marketers improve their businesses.

The team is also working with Ohio Proud to offer marketing workshops in four areas of the state. These workshops will offer information about how the Ohio Proud program can benefit your business, marketing your business on social media, and more. Join us to learn about free and low-cost tools to assist you in managing your on-line presence to maximize your business opportunities. You will learn about practical tools, trends, and strategies for 2016.

If you would like more information about the OSU Direct Ag Marketing Team or would like assistance in marketing your ag business, check out our website at http://southcenters.osu.edu/marketing or email Christie Welch at welch.183@osu.edu.

Aquaculture Boot Camp achievements and impacts

By Dr. Hanping Wang, Senior Scientist

In the past three years, we successfully developed and delivered the Aquaculture Boot Camp (ABC) program. The ABC program offered integrated training in aquaculture production and business management strategies with "3-I" levels: **Intensive**, an in-depth level involving immersion in a year-long hands-on training and mentoring program; **Intermediate**, a mid-level involving participation in a variety of learning activities; and **Introductory**, a general level where sharing of information was the goal.

For the ABC Intensive, a classroom/online-based course was developed based on the Aquaculture DACUM in 2013. Twelve monthly informative educational modules and materials in aquaculture production, and twelve monthly educational modules and materials in business and marketing were designed/developed and delivered in 2013. These modules were modified/replicated and delivered in 2014 based on the needs of the new participants. The ABC intensive level met the original goal by recruiting and training 50 potential new and beginning aquaculture farmers in Ohio. Each graduate student prepared a PowerPoint presentation describing who they are, why they joined ABC, what they learned and what they plan to do upon the course completion. A total of thirty-nine participants from both classes completed the training program and were awarded with certificates of completion. After participation in two ABC intensive classes in 2013 and 2014, students, on a scale of 1 being strongly disagree and 4 being strongly agree, reported an average of 3.5 when asked if the program met their expectations. Students indicated they would recommend this program to their business partners or relatives, and that they were clear on how to apply what they learned on the job or in their businesses. In addition, ABC intensive students self-assessed their knowledge prior to and after the delivery of the monthly content. On a scale with 1 being low and 5 being high, the overall pre-test mean in 2013 was 2.48 and 1.88 in 2014. The post-test mean in 2013 was 3.97 and 3.80 in 2014. These results indicate that ABC students significantly increased their level of knowledge of the content addressed in the program. By the end of the ABC 1 project, twenty-four new businesses/farms were created by the 2013 and 2014 ABC Intensive class graduates.

For both the Intensive and Intermediate ABC students, nine aquaculture workshops were offered in 2013, 2014, and 2015. Two Aquaculture Bus Tours were offered for Introductory, Intermediate and Intensive ABC students each year in 2013, and 2014. An ABC website was created to sustainably support the target audience. Podcasts of ABC Intensive training classes and practices were developed, and posted on the ABC website and distributed to new aquaculture farmers. Several brochures/pamphlets, fact sheets and worksheets were designed as part of the learning materials from October 2012 to August 2015. Three annual conferences geared toward mostly new fish farmers were organized. Twenty-three newsletters and three magazines were published and delivered to new and beginning farmers. As a result, the ABC Intermediate program surpassed the projected number of participants by 186.87%, and the Introductory program surpassed the participation goal by 557.10%. That means that 287 new and beginning farmers gained knowledge of aquaculture production and new technologies by participating in ABC Intermediate workshops and bus tours, and more than 5,000 participants gained new knowledge by accessing ABC Introductory, ABC website tools and information, ABC/OAA Newsletter and magazines.

In addition, some participants or potential new farmers who are interested in aquaculture training experience received ABC and OAA internships and mentoring. The ABC network was developed to broaden and sustain support services to new and beginning fish farmers.

Plasticulture strawberries at The Ohio State University South Centers (photo by Brad Bergefurd)

Horticulture program receives $83,000 in USDA and industry support to conduct strawberry market and season extension research

By: Brad Bergefurd, Extension Educator Horticulture /Agriculture and Natural Resources

Thanks to grants from the Ohio Department of Agriculture, the State of Ohio, the United States Department of Agriculture and the Ohio Vegetable and Small Fruit Research and Development Program, Ohio strawberry research and Extension education are increasing. Brad Bergefurd, Extension Educator and Horticulture Specialist, the projects' Principle Investigator, is leading this strawberry research project to further support the growth of the expanding consumer demand for locally grown strawberries.

Ohioans consume over 89 million pounds of strawberries annually, however Ohio farmers only produce 1.8 million pounds annually (USDA, NR-15-06, 2015). This additional 87 million pounds of strawberries, currently sourced from farms and related distributors outside of Ohio, has an estimated farm level value of $165.3 million.

This project will use applied strawberry field production research and educational programming to capture dollars and jobs that are currently being sent out of Ohio by Ohio's produce marketing industry, by expanding Ohio's strawberry production and plant propagation capabilities. This research will evaluate new strawberry cultivars, develop innovative plant propagation and field production systems, protective culture production systems including high tunnels and greenhouse production, drip irrigation, winter protection, fertility management, insect and disease control methods, harvesting, and production techniques that can be adopted by Ohio farmers to increase strawberry production from the traditional four week harvest season in June to a four-month production system.

J.M. Smucker Company in Orrville, Ohio that utilize a large portion of strawberries for their processing operations and Sanfillipo Produce Company in Columbus that utilize fresh market strawberries for their Ohio 1st Local Food program are providing industry support for this research.

Bergefurd Receives Distinguished Service Award From The National Association of County Agricultural Agents 2015

Brad Bergefurd received the 2015 Distinguished Service Award from the National Association of County Agriculture Agents during their Annual Meeting and Professional Improvement Conference held in Sioux Falls, SD. This award is given to Agents with more than 10 years of service in Cooperative Extension and who have exhibited excellence in the field of Extension Education. This award is only presented to two percent of the County Extension Educators in Ohio each year.

As Horticulture Specialist and Scioto County Agriculture and Natural Resources Extension Educator, Brad conducts field research, authors publications, and teaches on plasticulture strawberry, vegetable crop and hops production, produce auction development, urban agriculture and food hubs. Brad's responsibilities include: Co-Leader of the OSU Vegetable Crops Team; Director of the Great Lakes Vegetable Working Group; Ohio Produce Growers and Marketers Association Educational Advisor; Ohio Hops Guild Academia Director; NC SARE Research & Education Technical Committee and Co-leader for an agriculture development project in Senegal, Africa.

OSU Extension South Centers Employee Receives Recognition

Charissa Gardner has been recognized by the Epsilon Sigma Phi (ESP) for her outstanding contributions to and support of Extension educational programming. Charissa is the Extension Program Assistant for Horticulture and Direct Marketing.

Charissa received the ESP Meritorious Support Service Recognition Award on December 8, 2015 during the Ohio State University Extension Annual Conference at the Ohio Union on the Ohio State University campus.

This award is a nationally authorized recognition designed to pay tribute to staff in OSU Extension who, over time, have shown outstanding support for the mission, programs, and professional staff of Extension.

As Program Assistant for the Horticulture and Direct Marketing programs, Charissa has shown dedication and extraordinary commitment to the OSU College of Food Agriculture and Environmental Sciences (CFAES), OSU Extension and to the OSU Piketon Research & Extension Center. The breadth of her work has been considerable, including print and web design, editing, teaching, and management and coordination of the Ohio Marketmaker program. She teaches clientele by friendly, considerate, and creative problem solving and assists with managing annual program grants and revenues.

Epsilon Sigma Phi (ESP) is the honorary fraternity for Extension professionals.

For more information on OSU Extension, see http://extension.osu.edu.

The OSU South Centers has 37 Varieties of Hops on test at its Piketon, Bowling Green and Wooster Research sites. (photo by Thom Harker)

Developing the Ohio hops and malting barley industry

By: Brad Bergefurd, Extension Educator Horticulture /Agriculture and Natural Resources

Statewide interest purchasing local malting barley and hops by Ohio brewers has Ohio State University moving ahead with research and educational programming on these crops. Ohio commercial beer manufacturers and craft brewers send an estimated $36 million out of Ohio annually by purchasing hops and malting barley from west coast farmers. To help keep some of that economic activity within the state, the Ohio State University has developed a hop and malting barley research and education program focused on production and marketing.

Dr. Mary Gardiner of the OSU Entomology Department, Brad Bergefurd of OSU South Centers and OSU Extension Scioto County, and Dr. Sally Miller of the OSU Department of Plant Pathology are the Principle Investigators of the Ohio hops research and industry development program.

Agricultural statistics records indicate that in 1871, barley was planted on 81,000 acres in Ohio, producing approximately two million bushels total. Today, barley production ranks well below other small grains in Ohio with only 6,000 acres planted in 2014 compared to 620,000 acres of wheat. Most of the barley grain cultivated today is a six-row feed winter barley variety used for livestock feed on-farm or sold at local elevators. Of the 6,000 acres of barley, less than 50 acres in 2015 were estimated to be of the malting barley variety in demand by craft brewers.

Dr. Eric Stockinger of the Ohio State University Horticulture and Crop Science Department began growing and testing malting barley in the 2008–2009 growing season cultivation of malting type barleys at the Ohio Agricultural Research and Development Center (OARDC) in Wooster and throughout northern Ohio. *(continued on page 16)*

Developing the Ohio hops and malting barley industry (continued)

In 2013, Bergefurd and Gardiner partnered with Stockinger to expand this malting barley research into southern Ohio and began evaluating malting barley in southern Ohio at the Piketon Research and Extension Center, exploring both fall and spring planted varieties.

The hop and malting barley projects are allowing Ohio State researchers and educators to develop sustainable production practices directly related to Ohio growing conditions that will develop these Ohio industries. Data collected from the field research trials allows us to educate growers about production, pest management practices, and marketing strategies to help them generate farm profits from these highly sought after crops. The research is evaluating new cultivars, innovative production techniques, insect and disease control methods, harvesting, processing, and marketing techniques that can be adopted by Ohio farmers. The research will allow Ohio's beer manufacturers to spend their money in Ohio by purchasing Ohio-grown hops and malting barley and ultimately help create Ohio jobs, allowing Ohio growers to diversify into a high-value specialty crop. Preliminary research results indicate hops and malting barley can be successfully grown and marketed throughout Ohio and are adaptable to most Ohio soil types.

The OSU South Centers Horticulture program conducted several hops and malting barley educational programs and field days in 2015, reaching over 2,000 people interested in learning more about the hop and malting barley research that is being conducted by the Ohio State University. These events included monthly first Friday educational tours at both the Piketon and Wooster research locations, three Hops Field Days held at the Wooster, Piketon and Bowling Green research sites and the 2nd annual Hops and Craftbrewers Conference in Wooster with over 350 in attendance. An Ohio Hop Farm tour was conducted in partnership with the Ohio Hop Growers Guild, OHGG.org, where over 500 people participated in all-day tours of ten commercial hop farms throughout Ohio. Hops workshop were also taught in two of Ohio's Extension EERA regions in partnership with Extension Educators in those areas for new and interested hop farmers.

Over 1,000 people have visited the OSU hop research yards the past 2 years. (photo by Thom Harker)

Malting Barley Field Research is being conducted at the OSU South Centers. (photo by Brad Bergefurd

For more information on the Ohio Hops and malting barley research and industry development program, visit our Ohio Hops Facebook page at https://www.facebook.com/OhioHops or the OSU South Centers website http://southcenters.osu.edu/horticulture/other-specialties/hops for more information. If you would like to be added to the Ohio Hops email list serve to receive Ohio hop updates and information, contact Brad Bergefurd, Bergefurd.1@osu.edu or call the OSU South Centers 1-800-860-7232 or 740-289-2071 extension #132.

THE OHIO STATE UNIVERSITY

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