THE OHIO STATE UNIVERSITY SOUTH CENTERS

Connections Newsletter

Spring | 2015

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

2015 Spring Edition

The Ohio State University South Centers include:

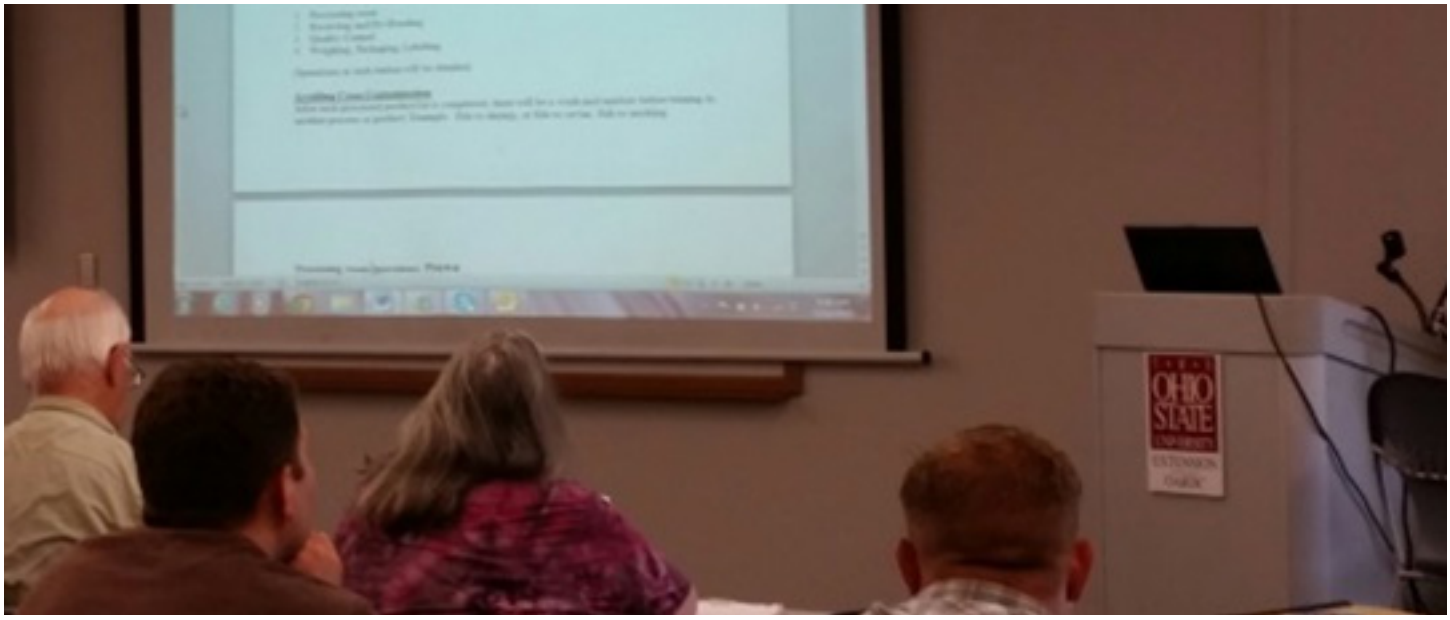
- **Piketon Research and Extension Center**
- **Aquaculture Research and Development**
- **Business Development Network**
- **Endeavor Center for Business Incubation**
- **Horticulture Research and Education**
- **Soil, Water, and Bioenergy Resources**

Is the Aquaculture Boot Camp (ABC) Program Over?

By: Estefania James, MS, Program Assistant

The Ohio Center for Aquaculture Research and Development at The Ohio State University South Centers has recently received many phone calls and emails requesting information how to register for the aquaculture boot camp program. One of the farmers said, “My friend told me about your program and that’s exactly what I need to move forward in my aquaculture business…is the boot camp over?” The answer is yes and no. The ABC program was funded for three years through a Beginning Farmer and Rancher Development Program (BFRDP) grant from the USDA’s National Institute of Food and Agriculture. Even though this is year three and the source of funding is over, the aquaculture Extension staff will continue offering support to the Ohio aquaculture industry.

Any new, beginning, or expert farmer will have access to the online resources available in the extension website (http://southcenters.osu.edu/). More workshops, hands-on training courses, fact sheets, and bus tours are planned for the coming months. (continued on *page 2)*



Is the Aquaculture Boot Camp (ABC) Program Over? *(continued)*

This is a joint effort of the OSU South Centers and the Ohio Aquaculture Association. The boot camp program has been a good source of collecting and assessing the needs of the fish farmers. As a result, two main topics were highly requested: Marketing/Processing and Aquaponics.

The first workshop was held at the OSU South Centers in May. According to our workshop evaluation, 92% of the participants will recommend this workshop to other farmers and they believe that the instructors were good communicators and knowledgeable on the topics. 70% of the participants strongly agreed that this workshop was applicable to their jobs. We like to thank our speakers: Traci and Craig Bell, Kelly O'Bryant, Kory Groetsch, and Dr. Dave Smith. Also, a huge applause goes to our special speakers and hands-on trainers: Dr. Stephen Reichley and Angela Caporelli. We are also proud to announce that one of our ABC 2014 graduates, Craig Bell and his wife Traci Bell, were recently notified that they received the USDA Small Business Innovation Research (SBIR) Phase II grant. This grant will definitely improve the great efforts the Bells have made at Ripple Rock Fish Farms.

The next workshop scheduled is the Aquaponics workshop July 10-11, 2015. For more information and to register, please visit the following link: http://southcenters.osu.edu/about-us/events/aquaculture. We are proud to announce our special speaker and hands-on trainer, Ryan Chatterson. He is the owner and operator of Chatterson Farms, a commercial aquaponics farm located on five acres in the beautiful hills of Clermont, FL and has been growing with aquaponics for over a decade. He spent ten years working at Aquatic Eco-Systems where he assisted in thousands of aquaponics projects ranging from backyard systems to large commercial design. While there, he also managed Green Sky Growers rooftop aquaponics greenhouse, built and managed two large outdoor aquaponics demonstration systems and helped to design the company's workshop curriculum, in which he taught over 150 students alongside Dr James Rakocy, Dr. Wilson Lennard, and others.

In early 2013, Ryan left the company to run his own commercial aquaponics farm, Chatterson Farms, and in 2014 started Aquaponic Engineering & Design, providing design, engineering and educational services to the commercial aquaponics industry. Estefania James, the ABC program coordinator, attended his workshop in April. She established a good connection with Ryan and admired his teaching skills. We look forward to having a great workshop with Ryan here in Ohio. We certainly invite all Ohio Aquaponics growers who are ready to expand their aquaponics farms and learn more about the technical aspects of designing their systems to attend this workshop. Please don't hesitate to contact us if you have any questions. Estefania James, james.742@osu.edu, 740-289-2071 ext. 127

Ryan Chatterson, owner and operator of Chatterson Farms in Clermont, Florida.

A close-up of Aronia in bloom. Photo by Gary Gao.

A Super Time for Super Berries

By: Gary Gao, PhD, Small Fruit Extension Specialist and Associate Professor

If you do a Google search for "super berries," a few plants will come up. Some of the uncommon ones could be Aronia berries, Chinese goji berries and elderberries, while common ones could be blueberries, blackberries, and raspberries. With growing interest in super foods by the general public, growers in Ohio might find super berries as viable cash crops.

We are lucky enough to have received a specialty crop block grant from the Ohio Department of Agriculture and the USDA to work on new and existing super berries. We planted a few of them this year. Our research team members have propagated a few elderberry plants. We also purchased some Aronia berry Chinese goji berry plants. We would like to thank the Ohio Department of Agriculture and USDA for this specialty crop block grant.

If you are thinking about planting any of the super berries, Gary Gao would like to hear from you! He created a Facebook page for Ohio Super Berries. The Web address is https://www.facebook.com/OhioSuperBerries. Gary will provide regular updates there with pictures and comments. This page can also be a good place for growers to connect with each other. There is also a Facebook page for "Aronia Growers East of Mississippi." The group was started by several growers in Ohio. Please check it out.

Here are a few pictures of the super berry plants planted at OSU South Centers in Piketon.

A Chinese goji berry. Photo by Gary Gao.

A close up of a Chinese goji berry flower. Photo by Gary Gao.

An elderberry plant with a green cyme, which is a flat topped flower cluster. Photo by Gary Gao.

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

GROWING BARLEY AND HOPS FOR LOCAL BEER-MAKING

By: Brad Bergefurd, MS, Horticulture Specialist and Extension Educator

Statewide interest in purchasing local malting barley and hops by Ohio brewers has Ohio State University moving ahead with research on these crops. Ohio commercial beer manufacturers and craft brewers send millions of dollars 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.

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 planted. 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 100 are estimated to be of the malting barley variety in demand by craft brewers.

In the 2008–2009 growing season, Dr. Eric Stockinger of the Ohio State University Horticulture and Crop Science Department began growing and testing cultivation of malting type barleys at the Ohio Agricultural Research and Development Center (OARDC) in Wooster and throughout northern Ohio. In 2013, Brad Bergefurd, OSU Extension Educator and Horticulture Specialist, partnered with Stockinger and began evaluating malting barley in southern Ohio at the Piketon Research and Extension Center, exploring both fall- and spring-planted varieties. *(continued on page 5)*

GROWING BARLEY AND HOPS FOR LOCAL BEER-MAKING *(CONTINUED)*

The hop and malting barley projects are allowing Ohio State researchers and educators to develop sustainable production practices directly related to Ohio growing conditions. 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 brewers 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 grown throughout Ohio and are adaptable to most Ohio soil types.

There is an ever-increasing Ohio market for hops and malting barley with the expanding craft brewing industry. The Ohio Department of Liquor Control has been seeing continued interest in applications for alcohol-manufacturing permits, a trend that continues into 2015. Hops and malting barley are main ingredients in beer manufacturing, and are highly sought after by local craft and home brewers. The majority of hops and malting barley are sold on the open market, with the northwest United States supplying the majority of U.S. hops. Currently, Ohio has an estimated 100 acres of hops and 100 acres of malting barley being grown on small acreage.

If you are interested in learning more about the hop and malting barley research that is being conducted by the Ohio State University, there are several upcoming educational opportunities. We are holding tours the first Fridays of August, September, October and November at Piketon and Wooster to view the hops and barley field trials. We also will be holding a Hops Field Night at Wooster, Ohio on Thursday, July 23 and a Hops Field Night at Piketon, Ohio on Tuesday, July 30. Registration is required for both field night events and the first Friday tours. Interested parties must register by calling McGlothin at 740-289-2071, ext. 132, or by emailing her at mcglothin.4@osu.edu. You can also 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 ext. 132.

Over 1000 people have visited our hop research yards the past 2 years. Photo by Thom Harker.

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

OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
OHIO STATE UNIVERSITY EXTENSION

Programs

- Small Business Development Center
- Manufacturing & Technology Small Business Development Center
- Ohio Cooperative Development Center
- Ohio Farmers' Markets
- Endeavor Center
- International Trade Assistance Center

Areas of Specialization

- Business Incubation
- Business Training
- Cooperatives
- Exporting
- Farmers' Markets
- Finance
- Management
- Manufacturing
- Marketing
- Small Business Start-up
- Technology

Business Development Network

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CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, go.osu.edu/cfaesdiversity.

The Business Development Network at The Ohio State University South Centers strives to help business owners, managers, and entrepreneurs make their businesses and ideas more successful by focusing on the core aspects of any business: money, marketing and management.

With our staff of highly-trained business counselors, we provide confidential in-depth one-on-one counseling at no cost to clients. We offer trainings, workshops, and on-line resources. We also have a network of partners and resources to benefit client needs.

The Ohio State University South Centers Business Development Network

1864 Shyville Road
Piketon, OH 45661
740-289-2071
southcenters.osu.edu/business/

Quick Facts

April 1, 2014—March 31, 2015

- Clients Served: 404
- One-on-One Client Assistance Hours: 4,998
- Business Starts: 21
- Jobs Created: 303
- Jobs Retained: 1,891
- Sales Increase: $27,400,367
- Capital Formation: $35,373,602
- Cost Avoidance: $166,200

Ohio Small Business Development Center

Ohio Development Services Agency

AMERICA'S SBDC ACCREDITED MEMBER

USDA

U.S. Small Business Administration SBA Your Small Business Resource

The Small Business Development Center Program of Ohio is a funded program of the Ohio Development Services Agency and the U.S. Small Business Administration. The support given through such funding does not constitute an express or implied endorsement of any of the co-sponsor(s)' or participant(s)' opinions, products or services. Special arrangements for the disabled will be made if requested in advance. This program is provided on a non-discriminatory basis.

The College of Food, Agricultural, and Environmental Sciences and its academic and research departments including, Ohio Agricultural Research and Development Center (OARDC), Agricultural Technical Institute (ATI) and Ohio State University Extension embraces human diversity and is committed to ensuring that all research and related educational programs are available to clientele on a nondiscriminatory basis without regard to age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, sexual orientation, or veteran status. This statement is in accordance with United States Civil Rights Laws and the USDA.

Training Professionals on Sustainable Advanced Energy Feedstock Production for Enhanced Ecosystems Services from the Ground Up

By: Rafiq Islam, PhD, Soil and Water Specialist

Bioenergy is expected to be one of the important sectors of future advanced energy investment. Currently, a portion of the US corn and soybean crops is being processed into biofuels. In 2012, biofuels accounted for ~7% (13.8 billion gallon) of total transport fuel consumption in the United States. Corn accounted for 94% of all biofuels, but corn alone cannot meet the US government's biofuel goal of replacing 30% of gasoline use by 2030. Corn also requires a lot of reactive fertilizer and chemicals, which can result in off-site nutrient movement and environmental pollution.

A variety of state and federal energy mandates and incentives, along with various sustainability and low carbon standards, are driving interest in growing several annual and perennial crops used for producing bioenergy and bio-based materials. Ones widely grown or being developed as energy crops include: Switchgrass, Big Bluestem, Eastern Gamma grass and other prairie grasses, Sudan-sorghum, sweet sorghum, energy beet, sugarcane, Miscanthus, Arundo, Guayule, Buckeye Dandelion and hybrid Willow and Poplar. Federal incentive programs (Biomass Crop Assistance Program, BCAP) include Miscanthus giganteus and Switchgrass as dedicated energy crops. However, the demand for food from corn and other crops, usually grown on good soils, will double by 2050 as worldwide population increases.

While using our best land to grow energy crops is not a logical choice, the question is: how can the economic benefits of growing crops for energy and bio-based products be balanced by the environmental concerns? To answer the question, we conducted a series of multi-state train-the-trainer workshops for professionals to equip them with knowledge-based information, teaching materials, and assessment tools to assist farmers in shifting to bioenergy feedstock production on marginal lands with enhanced ecosystem services. Four one-day workshop/in-service/field day events in 2014-2015 were organized in Michigan at the Kellogg Biological Station, Michigan State University; in Ohio at the Conservation Tillage and Technology Conference annual meeting and another event at the Ohio State University; and in Maryland at the University of Maryland, College Park campus.

The target audience was educators and professionals from University Extension, Natural Resources Conservation Service, Soil and Water Conservation Districts, the Environmental Protection Agency and other state and federal agencies, crop consultant associations, *(continued on page 8)*

Training Professionals on Sustainable Advanced Energy Feedstock Production for Enhanced Ecosystems Services from the Ground Up *(continued)*

farm organizations, ag enterprises, non-government organizations, energy professionals, bio-based company executives, students, and environmental groups. Others invited were: young and innovative farmers, farm leaders, county officials, professors, high school teachers, and bank, credit union and farm co-op officials.

Speakers from the Ohio State University (Rafiq Islam, Katrina Cornish, Randall Reeder, Denny Hall, Eric Romich, John Cardina, and Vinayak Shedekar), Michigan State University (Dennis Pennington, Paul Gross, Mark Seamon, Aaron Fox, Scott Swinton, Phil Robertson, and Steve Hamilton); University of Maryland at College Park, (Bahram Momen, Jason Wight and Wendy Ann Peer), University of Nebraska-Lincoln (Ismail Dwikat); USDA-ARS Washington DC (Kate Lewis - BioPreferred Deputy Program Manager) and Michigan NRCS (Jerry Grigar) delivered their presentations at the meetings. Organizations actively involved in organizing the workshops and in-service were: Ohio State University, Michigan State University, University of Maryland at College Park, University of Nebraska at Lincoln, Ohio Bioproducts Innovation Center of The Ohio State University, USDA-Agricultural Research Service Washington D.C., Conservation Tillage and Technology Conference, Ohio No-Till Council, Soil and Water Conservation Districts and Natural Resources Conservation Service in Ohio and Michigan, and the Corn Marketing Program of Ohio.

While the discussion and participation session was based on questions and answers between speakers and participants, the response and documentation part was based on post-workshop evaluations. Educational/ training materials were prepared by the project partners and reviewed by a multi-state advisory panel. During these events, speakers/presentations were followed by hands-on activities (use of soil quality test kit) and visualization of tools (OSU soil organic matter calculator), questions and answers, group discussions, and evaluation.

More than 160 educators and professionals (including farmers and students) from 5 states were trained during the workshops. Evaluations of the training activities showed that more than three-fourths of the participants were very pleased with the educational materials and tools provided for teaching local farmers. On average, participants stated a 32 to 40% increase in knowledge gain on the topics covered. Among the states, the highest knowledge gain by participants was reported in Maryland (39 to 49%) followed by 32 to 42% in Ohio, and the lowest knowledge gain (25%) in Michigan. The highest knowledge gain (20 to 38%) by the participants was reported on sorghum for ethanol (39 to 45%) and Soil Organic Matter calculator (31 to 53%), followed by 31 to 43% on bio-products, 36+1% on energy crops and bio-feedstock production, and 32 to 38% on ecosystem services. About 40 to 55% of the participants recommended the use of degraded land for bio-feedstock production followed by 30 to 36% for reclaimed mine land as compared to 5 to 13% for prime agricultural land or 4 to 12% for Conservation Reserve Program land. Based on communications during and following our workshops, we expect that our training information and tools will be shared with more than 1,000 farmers by professionals.

Change of Faces at the Ohio Cooperative Development Center

By: Hannah Scott, OCDC Program Manager

The Ohio Cooperative Development Center at the OSU South Centers welcomed Hannah Scott as the program manager on January 26, 2015.

Hannah is from Georgetown, Ohio, where she and her family continue to farm. Hannah earned her undergraduate degree from Duke University where she studied sociology, psychology and documentary studies. She was most recently a graduate associate in Ohio State's School of Environment and Natural Resources and is earning a Master of Science in Environment and Natural Resources with a specialization in rural sociology.

Christie Welch, prior program manager of OCDC, is now a Direct Marketing Specialist with OSU Extension based at the OSU South Centers. Christie's new role will involve working with individuals, groups, and businesses interested in direct marketing their food and agriculture products. She also continues her extensive work with developing farmers' markets throughout Ohio. We thank Christie for all of her hard work with OCDC and wish her luck in her new role!

In other personnel changes, Dr. Tom Snyder recently retired from The Ohio State University South Centers after 8 years with OCDC and a career in public service exceeding 50 years! Tom helped to develop many new and emerging cooperatives throughout Ohio and West Virginia and was instrumental in forging a successful partnership between OCDC and West Virginia University Extension. Tom was also a driving force behind the development of the Ohio and West Virginia Food Hub Network, which is focused on the cooperative development of local and regional food systems. We thank Tom for his great work and wish him well in his retirement!

OCDC Highlight: Ohio and West Virginia Food Hub Network

Food hubs are enterprises that aggregate locally sourced food to meet wholesale, retail, institutional, and individual demand. The concept, and efforts to create food hubs in local communities, has gained a lot of interest in Ohio and West Virginia. The notion of producing more locally grown and processed food and creating new jobs and businesses is of interest to many communities.

The Ohio Cooperative Development Center (OCDC) at The Ohio State University South Centers is leading an effort to work with new and emerging food hubs and incubator/training farms. The two-state Ohio and West Virginia Food Hub Network was formed in early 2014 and currently includes over twenty food hub efforts. The network is composed of food hub managers, directors, support partners and individuals working to form food hubs or incubator/training farms and is an effort to share information, develop linkages, and help these stakeholders gain tools for success to become active in institutional or wholesale food sales or distribution. Meetings of the network are focused on addressing the needs of these hubs and sharing information to help them overcome barriers. Meeting topics have included risk management, ensuring quality and safety of products, and available financial and technical resources. Members also participate in other related and network sponsored projects including special projects, participating in listserv emails, and in viewing webinars.

Hannah Scott, OCDC Program Manager. Photo by Beth Rigsby. (left)

The May 21 meeting of the Ohio and West Virginia Food Hub Network, which is facilitated by OCDC. Photo by Hannah Scott. (right)

The Ohio State University South Centers in Piketon Contracts with the University of Rio Grande

By: Patrick Dengel, OSU-Rio Grande Collaboration Coordinator and Business Development Specialist

The Ohio State University South Centers in Piketon contracts with the University of Rio Grande to provide service programs that assist business students with experiential learning, complimenting their formalized for-credit education. This program assists students with understanding the essentials in entrepreneurship. Patrick Dengel is the OSU-RIO Collaboration Program Coordinator, who establishes learning objectives, tasks, and focuses the activities of students in this program.

As an adjunct faculty member, Dengel teaches a simultaneous on-line and in-class for-credit course each semester in business management. This is the capstone class for students seeking their degrees in business. Students develop a workable small business plan and at the end of the course make a presentation about their plan. As a result of this course, several students have started new businesses, one has expanded their business via expansion loans using their small business plan, and another established increased product capacity in their manufacturing business.

In another joint effort, Dengel and Jason Winters, Chair of the College of Business at University of Rio Grande, established an OSU-RIO Collaborative television/radio educational show which assists students with understanding different media formats including: radio, television, YouTube and live internet streaming. These shows feature guests discussing business and education topics ranging from interviewing people from small businesses, personnel from business support organizations, programs managers and educators with The Ohio State University South Centers, and faculty/administration from various educational programs at the University of Rio Grande/Rio Grande Community College.

This project had its inception February 2010 using a weekly Internet Blog-Talk Podcast program. *(Continued on page 11)*

The Ohio State University South Centers in Piketon Contracts with the University of Rio Grande *(continued)*

This program provides business majors and MBA students with experience using different media formats as part of their entrepreneurial course work. With assistance, students schedule guests for interviews, schedule media show slots, use different marketing /advertisement formats, co-host interviews, manage behind-the scenes broadcasting and maintain statistical information. In the beginning, the shows were one hour long using the telephone as the principle microphone. All interviews have been archived on Internet Blog-Talk Radio for listening again.

As the listening audience grew, in January 2012 the show drew the attention of Mike Thompson, Director of the University of Rio Grande Instructional Design and Media Services. In addition to the Blog-Talk Internet Radio, the shows began simulcasting with the Rio Grande educational channel 17 TV station. This public access TV Program broadcasts under the Time Warner cable system using the public educational channels. With the addition of the public access channel 17 broadcast, viewers from four Southern Ohio counties can now view broadcast shows live, in addition to the audio program being available on the Internet through the BlogTalk Radio site. All completed broadcasts are archived online on BlogTalk Radio and YouTube for viewing and listening again.

As of January 2015, the OSU-RIO Collaboration TV/Radio again expanded its format by introducing three-half-hour programs, which include:

Wednesday, 1:00 to 1:30 p.m.
Business Talk – Focuses on people from different small businesses; personnel from small business support organizations; program leaders and educators with The Ohio State University South Centers; and students, faculty and administrators with the University of Rio Grande.

Wednesday, 2:00 to 2:30 p.m. (Each of the four shows is seen once a month):
Body Talk – Health program on maintaining healthy living
Exposition – Art and cultural program featuring local artisans displaying artwork
Agri-Talk – OSU educators discuss agricultural programs
Strictly Business – OSU program managers highlighting area businesses and entrepreneurs Wednesday, 3:00-3:30 p.m. (Each of the four shows airs once a month, featuring various guests):
Voice of Rio – Hosted by the President of the University of Rio Grande Voice of Rio – Hosted by the Provost of the University of Rio Grande South Centers Chat – Hosted by the Director of OSU South Centers
Voice of Rio – Hosted by the Deans of the University of Rio Grande

Using archive statistics, the OSU-RIO Collaborative has tabulated that since beginning the program in February 2010 to May 31, 2015, the program has had almost 32,000 views or listens. Statistics also show persons from 165 different countries have viewed or listened to at least one of the broadcasts.

By the end of 2015, it is the goal of the OSU-RIO Collaborative to distribute completed shows to other public access channels.

Readers can information about these educational programs at:

Our Web page: http://southcenters.osu.edu/small-business/business-talk

OSU-RIO Collaboration Facebook page: www.facebook.com/theosurio

Rio Grande Cable Access Facebook page: www.facebook/riograndecableaccess

Dr. Wang met with Dr. Ali Shame El Din (2nd from left), the President of Benha University, Dr. Mohamed (1st from right), the Dean of School of Veterinary Medicine, and Dr. Adel Shaheen (1st from right), the Chair of Department of Fish Management.

Dr. Hanping Wang Visited Benha University and WorldFish Center in Egypt

By: Hanping Wang, PhD, Senior Research Scientist

Invited by the Egyptian Embassy in Washington, DC, Dr. Hanping Wang recently visited Benha University in Cairo to discuss and enhance future scientific collaboration, and advise Ms Hiam S. Desouky's dissertation and defense. During the visit, Dr. Wang met with Dr. Ali Shame El Din, the President of Benha University, Dr. Mohamed, the Dean of School of Veterinary Medicine, and Dr. Adel Shaheen, the Chair of Department of Fish Management, and discussed further research collaboration in aquaculture and related areas. Benha University ranks third in Egypt. In the past four years, OSU South Centers and Benha University have jointly trained two Ph.D. students and one visiting scholar.

During the visit, Dr. Wang also visited WorldFish Center. WorldFish is an international, nonprofit research organization that harnesses the potential of fisheries and aquaculture to reduce hunger and poverty. Dr. Wang met Dr. Gamal Nagar, the center director, Dr. Malcolm Dickson, the project leader, and other researchers, and discussed potential collaboration with them in aquaculture. In addition, Dr. Wang visited the Egyptian Center for Aquaculture Research, and three fish farms. *(continued on page 13)*

Dr. Hanping Wang Visited Benha University and WorldFish Center in Egypt *(continued)*

With Dr. Gamal Nagar, the center director, and other project leaders at the WorldFish Center

Dr. Wang discussing genetics and breeding in Tilapia with a WorldFish Center project leader.

Dr. Wang touring WorldFish Center's fish farm.

Cage fish farm on the Nile River.

"O-H-I-O" in ancient Egypt.

Ms. Hiam S. Desouky (2nd from right) with her Defense Committee

Ms. Hiam S. Desouky Passed Her Defense and Received Her Ph.D.

By: Hanping Wang, PhD, Senior Research Scientist

Ms. Hiam S. Desouky, who was trained through a joint Ph.D. training program between the OSU South Centers and Benha University in Cairo, passed her defense and received her Ph.D. recently in the School of Veterinary Medicine, Benha University. Dr. Hiam S. Desouky completed her Ph.D. dissertation research under Dr. Hanping Wang's supervision at the OSU South Centers aquaculture genetics lab from April 2013 to March 2015, after finishing her course work at Benha University. Her dissertation entitled "Developing biomarkers to detect stressors in fish using molecular biological tools" received an excellent evaluation from her committee. The Ohio Center for Aquaculture Research and Development (OCARD) has established an international joint Ph.D. training program with several countries since 2005. The program has attracted more than twenty international scholars and Ph.D. students to work under Dr. Hanping Wang's advisement in the aquaculture breeding and genetics lab at Piketon.

Committee and faculty listen to Ms. Hiam S. Desouky's presentation

Proper site selection is important for high tunnels.
Photo by Brad Bergefurd.

Can Making High Tunnels Increase Farm Profits?

By: Brad Bergefurd, MS, Horticulture Specialist and Extension Educator

High tunnels, also called high hoops or hoop houses, are temporary structures used to extend the growing season of fruits and vegetables and are gaining in popularity with area farmers. These covered structures offer some environmental crop protection, but are highly management-intensive. Looking similar to greenhouses, high tunnels provide less climate control and rely on natural passive heating and cooling instead of heaters and cooling fans. High tunnels are constructed in the field to protect crops from the weather (rain, wind, cool or warm temperatures), as well as (in some cases) pests and are less expensive to construct and operate than traditional greenhouses.

Types of High Tunnels

High tunnels are most often constructed of metal bows which are attached to metal posts, driven into the ground 3 to 4 feet. They are typically covered with one or two layers of 6-mil greenhouse-grade polyethylene, and are ventilated by rolling up or dropping down the sides. There are various designs each offering advantages and disadvantages. Due to their permanent nature, care should be given to siting the high tunnel properly.

The gothic style high tunnel is the most popular due to its peaked design which allows for greater height along the sides, making the sides of the high tunnel more useful for crop production and resulting in a 15% greater growing space than quonset-style tunnels. The peak also sheds snowfall, reducing the chance of collapse under a snow load.

Advantages of High Tunnels

High tunnels have many uses on the farm. In cooler climates, they are used to elevate temperatures a few degrees each day, resulting in faster plant growth and higher yields. One main advantage of high tunnels is they allow farmers to produce crops outside of the normal growing season, thus meeting consumer demand on either end of the production season, typically when prices are higher. The modified climate inside the high tunnels also creates the opportunity to produce crops that can't normally grow if unprotected, that may lead to a higher percentage to top-grade fruits and vegetables at harvest. *(continued on page 16)*

Can Making High Tunnels Increase Farm Profits? *(continued)*

Disadvantages of High Tunnels

One of the primary disadvantages of the more permanent high tunnels is the fact that they are not easily moved. The result of this is that the same crop is grown in the same location every year, or a very short rotation is practiced. A short rotation or no rotation in vegetable production may lead to yield reductions and, depending on the crop, soil-borne disease development.

Another disadvantage to high tunnel production is the lack of exhaust fans for venting during hot weather. In most regions where tunnels are used, tunnels will overheat at some point during the crop production season unless manually vented as the temperature inside the tunnel rises. On warm sunny days, air temperatures in poorly vented tunnels can easily be 40o F greater than ambient outside temperatures.

Conclusion

For most farmers, the advantages of high tunnels outweigh the disadvantages. Thousands of fruit and vegetable farms in the U.S. successfully use high tunnels to extend the growing season. A farmer considering high tunnel production should first do some preliminary research and receive training in high tunnel production.

To teach Ohio farmers about high tunnel production and how they could adopt this new and emerging technology on Ohio farms, thanks to a USDA National Institute of Food and Agriculture grant, the Ohio State University South Centers hosted a high tunnel training program on April 27 and 28, 2015, at the Piketon Research and Extension Center in Piketon, Ohio. Individual trainings were tailored for the beginner and the advanced grower. This training included hands-on training on six local high tunnel farms and at the South Centers high tunnels.

Integrated pest management is required for a profitable high tunnel crop. Photo by Brad Bergefurd.

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