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- OSU Learning Center South
- Small Business Development Center
- Manufacturing & Technology SBDC
- Ohio Cooperative Development Center

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# Connection

## 2010 Achievements: A Year in Review

### FARMS, FORESTS & STREAMS

### Aquaculture Outreach/Extension

*By: Dr. Laura Tin*

The mission of the Ohio Center for Aquaculture Research and Development (OCARD) at the OSU South Centers is to support the development of a sustainable aquaculture industry in Ohio. This is accomplished through a variety of research and Extension projects. Research and Extension efforts are designed after input from the industry and are focused on increasing the economic impact of aquaculture in Ohio. In 2010, OCARD personnel provided consultations to 15 private businesses and toured over 100 people through research and demonstration facilities in Piketon and Bowling Green, Ohio. Participants included prospective fish farmers, local school groups and visitors from Poland, Tajikistan, West Virginia, the Ohio Bee Keepers Association, the Ohio Young Farmers Association, and a local retirement community. Staff made over 25 presentations to audiences around the state at venues including the Ohio Aquaculture Association Annual Meeting, Ohio Small Farm Conference, Marietta College, Shawnee State University, and the Farm Science Review. Three intensive workshops: Perch School, the Ohio Soy-Aqua Bus Tour of Farms and the Live Feeds Workshop, were conducted in the past year. The OCARD program was featured in multiple media pieces including television, radio and newspaper.



Yellow Perch

In addition to our primary research initiatives on selective breeding and baitfish culture, several outreach and demonstration projects were initiated as well. These include: partnering with the Ohio Soybean Association and the OSU South Centers Business Development Network in writing two proposals; working with a bluegill producer on a large-scale on-farm production project, collaborating with other aquaculture Extension Specialists to develop an eXtension Community of Practice; continuing the freshwater prawn quality assurance demonstration work; and working with Ohio companies exploring algae as a biofuel or possible aquaculture feed ingredient. Six businesses were targeted for additional support and assistance in achieving their expansion plans in the areas of locally produced fish feeds, alternative protein sources for aquaculture diets, and increased tilapia and marine shrimp production. Two Ohio businesses were assisted with submitting a Small Business Innovative Research (SBIR) grant and three other producers were assisted with submitting a Sustainable Agriculture Research and Education (SARE) grant.

A significant amount of effort this year was put toward implementing the new Ohio State Plan for Aquaculture. OCARD worked closely with the Ohio Department of Agriculture (ODA) to develop, and now implement, this plan. Some results of this partnership include successful implementation of a USDA feed reimbursement program, where producers received partial rebates for feed purchased in 2008 and 2009, the hiring of an Aquaculture Coordinator at ODA to help with the development of the industry, the hiring of an Aquaculture Marketing Specialist at ODA, the support for a summer intern focusing on fish health and the completion of an in-depth feasibility and market analysis of the aquaculture industry in Ohio to help determine the best steps for industry growth.

The aquaculture industry continues to grow in Ohio. Currently there are over 250 mostly small farms catering to niche markets like pond stocking and food fish markets. However, there is growing interest in taking aquaculture to the next level. Many feel that the next level is the development of indoor recirculating aquaculture facilities that can capture larger markets by providing consistent, safe, locally raised product year-round. Activities in 2010 put us on the path to achieving the goal of continued growth in the Ohio Aquaculture industry in 2011.

## BUSINESS & ECONOMIC DEVELOPMENT NETWORK

### Local Food & Local Fun = Ohio Economic Development

By: Dr. Julie Fox

Connecting Ohioans with local food and local fun got even easier in 2010 thanks to the research, Extension programs and outreach from the OSU South Centers. Education on the following programs reached more than 1,800 professionals including small and medium-scale producers, food processors, farmers' market managers, grocery store managers, chefs, winery operators, beekeepers, aquaculture farmers, Christmas tree growers, Extension professionals, community leaders, tourism professionals, entrepreneurs, international visitors, and OSU students.

#### ◆ Local Food

OSU's commitment to local foods is shown throughout Extension programs, OARDC projects, CFAES classes and the commitment of dining services to serve local food on campus. To support these efforts, Julie Fox, direct marketing specialist at the OSU South Centers, made statewide local food presentations, spoke at the 2010 Local Food Summit, published a new fact sheet, recorded local food presentations on DVD and YouTube, and served on the Governor's Food Policy Council, the Market Connections Task Force. Program funding was provided through USDA/ODA Specialty Crop Block Grants. Local food sales through all marketing channels account for a growing share of the total U.S. agricultural sales (Martinez, et al., 2010; Packaged Facts, 2007). Food and agriculture is Ohio's top industry, contributing \$79 billion to the state's annual economy.



#### ◆ Market Ready

As the demand for local food sources expands, so does the demand for better understanding of how to conduct business with buyers from restaurants, grocery stores and institutions. A team from Kentucky and Ohio addressed this opportunity by launching the "Market Ready" educational program for producers. In 2010, a select group of 15 educators participated in a train-the-trainer program and 150 producers participated in one of five pilot workshops held throughout the state. Immediate program evaluations indicated increases in knowledge, and follow-up evaluations indicated increases in sales contacts and sales revenue. Program funding was provided through USDA/ODA Specialty Crop Block Grants. For 2011, Julie Fox secured funding from SARE Professional Development funds and additional Specialty Crop Block Grant funds to support the program team as they help more producers explore direct marketing channels and prepare to sell to retail and wholesale markets.



#### ◆ Ohio MarketMaker

Ohio MarketMaker is a free, web-based resource for all businesses in the food industry. The program is part of a national network of state websites that connects growers with buyers, other producers, and a variety of food industry contacts. These connections provide potential solutions for efficiencies in locating, aggregating, grading, processing, packaging and distributing product year round. In each month of 2010, an average of 6,500 unique users visited <http://www.ohiomarketmaker.com>. OSU Extension and the MarketMaker partners received the U.S. Department of Agriculture National Institute of Food and Agriculture (NIFA) Partnership Award in the category of multi-state efforts. "With projects like MarketMaker, we pull together resources more effectively than we could do on our own, especially in times of limited budgets," said Julie Fox, direct marketing specialist at the OSU South Centers. "This award recognized the academic institutions involved in each of the MarketMaker states, but we couldn't excel without collaborating with Ohio agencies and organizations that share the same goals of helping farmers improve profitability and communities improve their economy." Ohio MarketMaker is supported through the collaboration of OSU Extension, OARDC, the Ohio Department of Agriculture/Ohio Proud, the Ohio Farm Bureau/Our Ohio, the Center for Innovative Food Technology, and the Ohio Grape Industries Committee.



## BUSINESS & ECONOMIC DEVELOPMENT NETWORK

### Local Food & Local Fun = Ohio Economic Development continued:

#### ♦ Social Media Marketing

One of the most requested topics for Direct Marketing Team members during the past 12 to 24 months was social media marketing. One-hour and full-day hands-on sessions were delivered to state and national audiences. The team publishes articles, develops fact sheets and provides education to help producers address the opportunities and challenges of rapidly evolving technologies. According to a December 2010 Pew Research Center report, social networking is widespread in the United States with 46% of Americans reporting use of websites like Facebook (<http://pewglobal.org>). According to Nielsen reports, 60% of the Internet users access the Internet through some type of mobile device. As of June 2010, 59% of smartphone owners reported having downloaded a mobile app in the last 30 days (<http://nielsen.com>). During the next year, the team will secure funding to develop curriculum and evaluate impacts of social media marketing.



#### ♦ Tourism

The OSU South Centers provides leadership for a statewide tourism team that brings together leaders from industry and academia to contribute to Ohio's \$36 billion tourism industry.

Projects included the Ohio Tourism Toolbox, which attracted nearly 1,400 people in 2010. Visit the site at: <http://ohiotourism.osu.edu>.

Various working groups focused on agritourism, culinary tourism, heritage tourism, nature-based tourism, and an industry needs assessment.

In addition to the 1,800 participants in 2010 educational sessions, the Ohio Direct Marketing Team and Ohio Tourism Team members provided one-on-one consulting with entrepreneurs, facilitation with community leaders, posters at state and national conferences, and multimedia educational resources on the team websites. More than 1,500 people visited the Ohio Marketing Connections website <http://directmarketing.osu.edu>.

According to the 2007 Census of Agriculture, Ohio is one of the top 10 states for direct sales and agritourism. With strong consumer bases in numerous metropolitan statistical areas and the widespread support for innovation, Ohio offers tremendous opportunities to grow the economy through local food and local fun. Team leader, Julie Fox, stays involved in state, national and international activities to support the work of the teams. For further information, contact OSU Direct Marketing Specialist, Julie Fox, [fox.264@osu.edu](mailto:fox.264@osu.edu).



## BUSINESS & ECONOMIC DEVELOPMENT NETWORK

### Business Development Network

*By: Business Development Network Team*

The Business Development Network (BDN) operates under a unified delivery model with several programs. The BDN serves the Ohio Economic Development Region 7 as the Small Business Development Center, as well as Manufacturing and Technology Small Business Development Center, serves Appalachia through the *Growing!* Farmers' Market program, and serves Ohio through the Ohio Cooperative Development Center. The BDN also partners with the TechGrowth Ohio program to serve the 19-county Entrepreneurial Signature Program for AgBioscience. The Endeavor Center is a business incubator facility built in 2005 that is the hub of our BDN activity.



The Small Business Development Center counselors provided 6,288 hours of business counseling to 522 clients throughout the year. The efforts of The Small Business Development counselors resulted in the creation of 76 new jobs and assisted with the retention of 2,492 jobs. The businesses the Center served in 2010 were able to acquire \$5.7 million of additional capital in the form of loans or equity.

The OSU South Centers staff worked closely with Ohio Department of Agriculture and Buckeye Hills Regional Development District to create a revolving loan fund for the agricultural business sector. The primary focus areas of this program are aquaculture, bio energy and food processing. Typically, it is difficult for traditional lending institutions to finance these types of projects. The total loan fund is \$900,000 and is available to businesses located in designated USDA rural business areas throughout the state.

The OSU South Centers works with our other regional higher education institutions. The center has successfully established a relationship with The University of Rio Grande through the MBA program to provide experiential learning opportunities to the students. Six MBA students have been able to heighten their learning experience through real world business applications through this partnership. The impact is the exposure students receive to a non-traditional learning environment with real word learning experience and applications.



The Manufacturing and Technology Small Business Development Center provides counseling in lean processing and manufacturing practices to area companies. The center provided 579 counseling hours to 62 clients during 2010. Those companies reported a \$150,000 increase in sales as a

result of the assistance the center provided. The counseling efforts of the Manufacturing and Technology Small Business Development Center assisted with the retention of 575 jobs. Together, the Business Development Network saved clients over \$1.4 million in cost avoidance during 2010.

The BDN assesses the needs of our communities and partner organizations and addresses the identified issues through customized training events. Trainings are a key component to delivery of services. During 2010, twenty-nine training events were hosted with over 600 attendees. During 2010 we launched "Tech Tuesdays," a new training series based on technology solutions. These trainings center on technologies such as Skype and Social Media that are a cost-effective solution for small- and medium-sized businesses.

The partnership with the TechGrowth Ohio Third Frontier Entrepreneurial Signature program has led to the launch of four companies with new products in the region. The program has provided over \$180,000 in grant funding during 2010 to assist with the commercialization of new inventions.

The Endeavor Center facility originally contained 26 permanent office spaces of varying configurations and sizes. Due to the growth of multiple business partners housed in the facility, two additional storage spaces were converted into office spaces in 2010. The facility averaged 100% occupancy for the year, and 18 individual businesses now call the center home.

Endeavor Center business partners created over 70 new jobs in 2010, bringing the total number of jobs created by business partners housed within the center to over 350 since the facility's opening. The new high-skill, high-wage jobs added by business partners of the Endeavor Center added over 5 million dollars of new activity to the local economic community in 2010. Overall, the economic impacts of the 350 new positions created by Endeavor Center partners since its opening have had a major impact on the economic vitality of the region.



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## BUSINESS & ECONOMIC DEVELOPMENT NETWORK

### Business Development Network continued:

One Endeavor Center partner graduated from the facility in 2010, expanding from an initial employee count of 0 in 2006, to 10 in 2010. Since startup, sales grew to 1.4 million dollars in 2010. Their new 5,000 square-foot facility was completed at a cost of nearly 2 million dollars.

An Endeavor Center partner, inSolves, was once again named in Inc., Magazine's list of 200 fastest growing, privately held companies in the United States in 2010; this company was able to achieve this success through the assistance of our staff and facility location.

The Ohio Cooperative Development Center (OCDC) provided 31 new and emerging business clients with 1,311 hours of technical support, such as providing seed grants, conducting feasibility studies, facilitating bylaws development, facilitating incubator web site development, and providing one-on-one counseling and training. This resulted in the legal formation of 10 new businesses designed to cooperatively provide employee recruitment, training, and marketing, product processing, purchasing, and funding/grant procurement.



The Ohio Cooperative Development Center provided a significant amount of technical support for the formation of Benefits Unlimited, Inc., a healthcare cooperative which went live with their services in June 2010. This new business has created six new jobs and helped nine companies, representing 310 employees, and saving over \$1,143,000 on their healthcare plan annual rates. Not only do these savings occur every year, but the annual rate increases are approximately 5-8% as opposed to 10-20% or even higher with conventional plans. At an average salary of \$50,000 per employee, 22 jobs could be saved with this level of cost avoidance.

The OSU South Centers and the Ohio Cooperative Development Center provided technical support such as conducting a USDA required feasibility study and assisting in writing a USDA Value-Added grant for a small business in Pickaway County. The business was approved for \$70,000 in funding in 2010. This helped a new emerging minority owned business increase their capacity.

The Ohio Cooperative Development Center provided technical support services in conducting a major feasibility study and assisting in developing a business strategy for expanding broadband services in Ashland County. This plan included recommending that Ashland County become a part of regional non-profit groups applying for federal funding. The non-profit groups were approved for over \$74,000,000 funding in 2010, with the Ashland County share equal to approximately \$340,000. This funding will significantly impact the formation of a backbone and mid-mile infrastructure for the county, making it possible for the improved provision of quality broadband services.

The *Growing!* Farmers' Markets program assisted with the creation of 7 new markets in Ohio this year. Two new markets were assisted with determining a new location for their markets. The program identified and provided the 47 farmers' markets in the Appalachian Counties in Ohio with customizable marketing materials to assist them in promoting their markets. The impact of the training events and counseling for Farmers' Markets led 67% of the markets to develop a marketing plan. The program also assisted with the creation of a customizable marketing piece and 22% of the markets that used the piece indicated cost savings as a result of the materials provided. The *Growing!* Farmer's Markets program efforts assisted with the creation of 30 part-time jobs, 40 full-time jobs retained, and 70 part-time jobs retained in 2010. Ohio Farmers' Markets estimated an increase in sales of \$569,000 in 2010.



A significant impact of the program is the work with Ohio Department of Job and Family Services and Ohio farmers' markets to increase access to local foods for Ohio Direction Card (food stamps) recipients. This campaign and training program led 15 new markets to accept food stamps in 2010. The program also worked with ODJFS and Ohio farmers' markets that are eligible to accept the Ohio Direction Card to increase awareness that recipients can use their Ohio Direction card at farmers' markets. ODJFS direct-mailed literature to all Ohio Direction Card recipients within the zip code of an eligible market. While the total impact has not been quantified, markets indicated they experienced a significant increase in the number of Ohio Direction Card recipients shopping at their farmers' markets.

## BUSINESS & ECONOMIC DEVELOPMENT NETWORK

### Empowering Nonprofit Success

By: Becky Nesbitt

Helping nonprofit organizations reach their potential was the goal of OSU South Centers' Nonprofit Leadership Series. Leadership workshops designed specifically for nonprofits, focused on the distinctive needs and concerns of this growing sector of the business community. "While nonprofit organizations have some similarities to traditional for-profit businesses, they also have many unique needs. We're trying to provide information to address those particular areas," said Becky Nesbitt, Ohio State University Extension Specialist for Philanthropy, whose position is supported in part by the W.K. Kellogg Foundation. The series included quarterly day-long workshops at the South Centers' Endeavor Center.

The South Centers' mission is "to enhance southern Ohio by assisting people with informed decision-making through responsive research, education, entrepreneurial application, and collaborative partnerships." The Nonprofit Leadership Series helped to introduce the Centers' educational initiatives to area's nonprofit community. "I hoped to bring a new group of clientele into the South Centers and to provide informative programs to help meet their professional needs," said Nesbitt.

The first of the workshops, Nonprofit 101 was held in March 2010 and focused on the basics of starting and managing an effective nonprofit business structure. Monica Moloney, from the Ohio Attorney General's Charitable Law Section, shared information about establishing a nonprofit, the distinction of a tax-exempt status, and the importance of understanding charitable guidelines and laws. Duane Rigsby and Kelly O'Bryant, specialists at the OSU South Centers, provided participants with a variety of free online tools to help expand the organization's marketing and fundraising efforts.



The second workshop in the series, Fundraising in Appalachia, was held in June 2010. Representatives from Ohio's Attorney General's Office helped more than 70 workshop participants explore the legal and ethical considerations of fundraising. Kim Cutlip, Executive Director of the Scioto Foundation shared a strategic plan to help participants construct an effective annual fund; and creative, real-world stories of fundraising efforts were shared by Andrea Leffingwell, Development Director from the Ebenezer Medical Outreach and other successful development directors.

In September 2010, the Nonprofit Innovation workshop featured Bob Hood, Executive Director of the Gallia County Convention and Visitors' Bureau, who offered participants the opportunity to learn strategies to

utilize best business practices including transparency, ethics, building community partnerships, communication, and handling finances. Dr. Julie Fox, OSU Extension Direct Marketing and Tourism Specialist, challenged Appalachian Ohio nonprofits to adopt an entrepreneurial spirit by understanding risk taking, tapping into innovative thinking, and utilizing key resources.



The quarterly educational series was concluded on December 8, 2010 with the Nonprofit Leadership workshop. Treva Williams, OSU Extension Educator, helped participants learn about the importance of civility in the workplace, how to improve customer service, and proven techniques to strengthen communication with board members, donors and volunteers. Participants also examined techniques to deal with difficult people while building relationships and improving productivity with professional consultant, Scott Hinsch.

The 2010 Nonprofit Leadership Series workshops were attended by more than 200 individuals representing 88 nonprofit organizations. Ninety-nine percent of the participants surveyed, indicated that as a result of attending a workshop, they had learned at least one new strategy that would improve

their ability to strengthen the nonprofit organization with which they work. All of the participants (100%) stated that they had gained a better understanding of community philanthropy and how their organization contributes to growing their community's assets. "Much of Appalachian Ohio's charitable giving is directed to the nonprofit organizations serving these rural communities," said Nesbitt. "We wanted to provide educational resources related to best business practices, as well as opportunities for professional development for the individuals associated with these organizations, and we hoped to help them gain a greater understanding of how they can utilize local philanthropy to strengthen and grow their community's resources."



**FARMS, FORESTS & STREAMS****Ohio Aquaculture Research and Development Integration Program (OARDIP) Achievements and Impacts 2010**

*By: Dr. Hanping Wang*

In the past year, in collaboration with the OSU Department of Animal Science, the OSU Department of Food Science, the OSU South Centers Business Development Network, the Ohio Soybean Council, and several international Institutions, OARDIP has accomplished eight studies and projects, published five journal articles and four proceedings papers, received three research grants in a significant amount of funds, trained five graduate students, post doctoral fellow and visiting scholars, and generated six new grant proposals.

**O'GIFT (Ohio Genetic Improvement of Farmed-fish Traits) Program:** Multiple improved lines of yellow perch have been developed. The testing data show that the improved lines grew 28% - 52% faster than unimproved fish. The third generation of improved fish has been created in 2010 from the 2006 year-crop through crossing and mating more than 100 families. Two F<sub>2</sub> mapping families have been grown to maturity with growth monitored for genetic maps identifying genes important to increasing production. Three projects related to growth gene expression and sex maturation mechanism under different temperature and photoperiod regimes in yellow perch were completed. Three manuscripts on these projects have been completed. An experiment in evaluating family growth response of genetically improved fish to a soybean meal diet (SMD) vs. fishmeal-based diet (FMD) has been completed and the results are being used to genetically improve SMD utilization rate of yellow perch. For bluegill, twenty families of all- male populations, which would grow 40-50% faster than a mixed-gender population, have been successfully created through selective breeding. In addition, a project evaluation of hatchery stocks and wild populations of largemouth bass across North America and Asia has been completed as well as a manuscript. The results of this study provide a valuable base for developing future selective breeding program for largemouth bass. The O'GIFT program is expected to increase aquaculture production of perch, bluegill and largemouth bass by 35-50% by developing genetically improved broodstocks.

**Bowling Green Aquaculture Center (BGAC):** The BGAC has created the first hatchery of its kind in Ohio that will focus on the breeding and rearing of juvenile spot fin shiners, a new baitfish species for Ohio. BGAC has established indoor spawning protocols for spotfin shiner culture, and is making progress with live first feed types and transitions to prepared diets for the fully indoor culture of spotfin shiner juveniles and market size adults. BGAC has been collaborating with Reed Mariculture of San Jose CA to design, construct and pass on to the producers the means of producing rotifers, which are a necessary live first feed for shiners. The BGAC hosted a meeting of the baitfish producers in 2010 to evaluate the past years' performance and future needs of the producers. Enthusiasm in this new enterprise is high with big expectations for 2011.

In December the BGAC held a "Live Feeds Workshop" which was well attended with much interest shown by producers of many species of interest in the state. The site received approximately 120 visitors and received approximately 200 phone calls from those interested in the activities of the Bowling Green Site. Visitors of note were Congresswoman Marci Kaptur and the new Director of the Ohio Department of Agriculture (ODA), Jim Zehringer.

**Aquaculture Genetics and Breeding Lab (AGBL):** This is the first lab of its type in the Midwest and crucial to the success of the O'GIFT program. In this lab, genetic relatedness charts and genetic pedigrees of selected broodfish have been constructed for breeding programs for the past years. Genotyping of 1500 broodfish for genetic pedigree was completed for the breeding program and additional 80 microsatellite markers have been developed in 2010 for constructing genetic maps for traits of growth and VHS resistance. Family identification technology using DNA for selective breeding in yellow perch and bluegill has been established. A first genetic linkage mapping of bluegill has been completed for selective breeding and published in *Aquaculture International*. Genotyping for 1250 largemouth bass from 27 sites and 11 states was finished for stock evaluation.

**Fish Muscle Growth and Nutrition Program:** We have completed breakthrough research demonstrating that wheat gluten based diets supplemented with lysine could replace animal protein based diets for Yellow Perch. These diets could result in a cost savings of 10-15% in feed costs and they would reduce the impact on the natural resources. Three manuscripts related to nutrition and proteomics are in peer review.

**Aquaculture Technology Transfer (AT<sup>2</sup>) and Dissemination:** In 2010, OARDIP personnel provided 15 private business consultations and toured over 100 people through their research and demonstration facilities in Piketon and Bowling Green, Ohio. Staff made over 25 presentations to audiences around the state. Three intensive workshops including Perch School, the Ohio Soy-Aqua Bus Tour of Farms and the Live Feeds Workshop, were conducted in the past year. About 20 clients received individual business planning assistance designed to enhance the success of their business ventures.

**Economic and Scientific Impact:** Aquaculture sales in Ohio have more than tripled from \$1.8 million to \$6.6 million in recent years. Nationally, Ohio ranks first in sales of yellow perch for food and is the number one bluegill producing state. Ohio also ranks fourth in sales of baitfish and largemouth bass sold for sport and fifth in number of baitfish farms. In all, fifty-six journal articles and proceedings papers have been published, including five journal publications and four proceedings papers in 2010.

**FARMS, FORESTS & STREAMS****Horticulture Achievements and Impacts 2010**

*By: Brad Bergefurd*

**Strawberry plasticulture research and Extension education**

Strawberry plasticulture is one of the most economically attractive alternative crops for small and medium sized family farm operations seeking high value crop production opportunities or diversification out of tobacco. This production system, known as the annual strawberry plasticulture system, treats strawberry plants as annuals (planted, harvested and destroyed within a 12-month period) which has been shown to provide more uniform plant stands unaffected by summer disease, drought or weed competition, as well as earlier fruit harvest, larger berry size, heavier yield potential, and shorter turnaround time from planting through harvest (eight months). This production system, initially used by growers on the West Coast and North Carolina, has proven to be a successful strawberry production technique for Ohio growers.

OSU plasticulture strawberry research has led to a doubling of the value of gross returns per acre of a strawberry crop, with growers reporting returns of up to \$60,000 per acre. The expanding strawberry industry in Ohio is generating in the range of \$5 million annually in fresh strawberry sales from mainly U-Pick (customer harvest) and local roadside sales, and has the potential of doubling in the next five years. The plasticulture strawberry research at the OSU South Centers has created the opportunity of extending the current four week harvest season to potentially several months using plasticulture growing techniques and high tunnels.

**Row cover management research and Extension education**

The potential importance of row cover applications in strawberry plasticulture in the fall and winter has been investigated in southern Ohio. Growers and educators have had specific questions related to the timing of row cover application in the late fall or early winter. Row cover research at the OSU South Centers has identified the proper row cover weight for Ohio is the 1.5 oz./sq. yd. cover vs. the medium weight covers of 1.0 and 1.2 oz./sq. yd. that are used in more mild winter production areas such as North Carolina.

**Strawberry runner tip and plug plant production research and Extension education**

On-farm research trials have shown that Ohio growers are able to economically produce their own runner tips from stock plants planted and grown on their own farms, utilizing more ecologically sound, sustainable and environmental friendly production techniques such as use of composts instead of environment damaging soil fumigation. Three years of field research has shown that runner tip production is an economically viable production technique that can 1) save growers approximately \$2000 per acre, compared to purchasing out-of-state/country runner tip costs, 2) reduce the reliance and costs of soil fumigation techniques, 3) utilize existing on-farm land, labor and resources, 4) reduce the input costs associated with shipping and fuel surcharges, 5) prevent the importation of yield robbing diseases such as Anthracnose and Phytophthora which have occurred in recent years, 6) increase the timeliness and availability of "on-farm" produced runner tips, and 7) reduce grower losses spent on the purchase of out-of-state/country tips that are of poor quality. This strawberry tip production technique allows for adoption of this socially responsible production technology by growers throughout the Midwest United States.

**Wine grape research and Extension education**

Ohio is one of the top 10 wine-producing states with more than 850,000 gallons produced every year. The number of Ohio wineries has grown from 124 in 2008 to 143 in 2010, and wine production increased nearly 500,000 gallons from 2006 to 2008, making wine grape production an economically attractive alternative crop for small and medium size family farm operations seeking high value crop production opportunities or diversification out of tobacco.

Due to OSU field research results and independent grower on-farm trials, Ohio's grape portfolio now includes vinifera, the type of grape from which Cabernet Sauvignon, Cabernet Franc and Riesling wines are made, as well as French-American hybrids. Sixty-five percent of Ohio wineries have been established in the past decade. OSU South Centers wine grape research trials and Extension outreach efforts are helping growers to make the proper crop planning and management decisions to profit from the thriving Ohio wine and grape industry.





**FARMS, FORESTS & STREAMS****Soil and Water Resources Program Achievements and Impacts 2010**

*By: Dr. Rafiq Islam*

**Advanced energy research and Extension**

Bioenergy is one of the potential sectors in future energy investment to replace imported fossil fuels. However, using our best land to grow biofuel crops is not a logical choice. Marginal quality land including CRP is relatively low priced and may be suitable to grow fast-growing shrubs and trees, weeds (*Autumn Olive*), and perennial grasses (native species) as bioenergy feedstock crops. As municipalities nationwide face growing populations, and continue to produce more waste, they are pleased with any opportunity to dispose of sewage sludge in a positive, productive, and environmentally managed way. Electric utilities with coal-fired power plants face a similar problem with the disposal of flue gas desulfurization (FGD) gypsum. Applying sewage sludge and FGD gypsum on marginal land as soil amendments to grow bioenergy feedstock will provide a valuable use for these waste products. Results disseminated from our research have motivated Ohio farmers to utilize their marginal lands for bioenergy feedstocks, biopolymers, and phyto-chemicals. More than 100 farmers in Ohio are actively involved with our statewide bioenergy research and Extension demonstration. Moreover, a number of power industries, municipalities, biotech and mining companies, as well as what type of organization have already been involved with the OSU South Centers to pursue bioenergy research and demonstrations in Ohio.

**Sustainable agriculture and ecosystems services**

Our research on sustainable agricultural management practices suggested that including cover crops and manures in transitional no-till corn-soybean-wheat rotation is economically viable and environmentally compatible to increase crop yields, improve soil quality, reduce greenhouse gas emissions, and enhance ecosystems services. Crop rotations with sun hemp, winter peas or cow peas with minimum N fertilization improved/maintained economic crop yields 5 to 8 bushels/acre, reduce cost of farming operations approximately 18%, minimized inputs of chemical fertilizers and pesticides 50 to 75%, enhanced soil quality over 15%, and improve water over time. Integrated use of cover crops and no-till approach will save \$5 - 6 per acre per year, which is equivalent to a savings of \$1,600,000 per year for growing crops in Ohio.

**Soil compaction management**

Compaction is an on-going problem to maintain productivity/workability in Ohio's wet and heavy clay soils. The compaction problem is more frequent in transitional no-till ground. OSU South Centers research showed that oilseed radish can grow more than 30" deep and break-up plow layer compaction. Furthermore, oilseed radish biomass can recycle more than 200, 60 and 200 lbs of N, P and K, respectively when applied with manures or biosolids. Use of oilseed radish as cover crop in no-till can save \$1,000,000 per year for managing soil compaction in Ohio compared, with sub-soiling and mold-board plowing.

**International education and Extension**

Over the years, The OSU South Centers have developed a national and international reputation in soil and water management research. As a result, internationally funded graduate students, scientists, and professionals as visiting scholars from India, Pakistan, and Turkey have joined our program to be involved in research, education, and Extension activities.

Irfan Aziz, who received his Ph.D. from the University of Arid Agriculture, Pakistan after completing his work in our Soil and Water Resources Lab as a visiting scholar. Dr. Aziz is now conducting research on sustainable agriculture and ecosystem services in Rawalpindi, Pakistan. He has received funds from the Pakistani government to establish collaborative research to evaluate, the impact of tillage and cover crops impact on soil quality and carbon sequestration.

Niaz Ahmed, who came to our Soil and Water Resources lab as a visiting scholar from Pakistan. Mr. Ahmed is now working on soil fertility and nutrient management research for irrigated cotton in Multan, Pakistan.

Mohammed Mubashir, a visiting graduate student from Pakistan, is now working on his Ph.D. on groundwater nitrate pollution and public health.

Dr. Kenan Barik, who came to the Soil and Water Resources lab as a post-doctoral fellow from Turkey, is now working on tillage, soil compaction, cover crops, and soil quality. He has received funds from the Turkish government to organize seminars and workshops on soil quality. Dr. Rafiq Islam was invited to Turkey to give two talks on climate change, future agriculture, and soil quality in 2010 as a visiting scientist to Dr. Barik's workshops.

Three post-doctoral scholars from India came to the OSU South Centers in 2010 to work on soil quality, carbon sequestration, and soil and water dynamics. Two of them have returned to India they are working on soil quality, greenhouse gas emissions and tillage operations. One is presently working on soil and water dynamics, plant water availability, and evapo-transportation (ET) modeling.



Pictured: Mohammed Mubashir, Niaz Ahmed and Irfan Aziz

## Buckeyes Boots for Kids

*By: Julie Moose*

OSU South Centers turned their horticulture research trials into an opportunity to give back to the community. This year, the fruits and vegetables harvested were sold to employees and Endeavor Center business partners for charitable donations. Although most produce was sold, anything left was donated to Pike County Outreach for distribution at their food bank.

Contributions collected from the sales were used to purchase and donate 50 pair of boots to the Buckeyes Boots for Kids drive. Employees also held a food drive during their Christmas party and presented it to Judy Dixon at Pike County Outreach, along with a cash donation from the produce sales.

"This is a great opportunity for OSU South Centers to give back to our local community," said Director Tom Worley. "Employees and partners were so supportive of the program that we plan to continue it next season."

For more information about Buckeyes Boots for Kids project, contact Beth Rigsby at 740-289-2071.



Pictured: Judy Dixon, Pike County Outreach and Dr. Tom Worley, Director, OSU South Centers

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- Utilizing a holistic approach to problem solving and program delivery to strengthen youth, individuals, families and communities
- Facilitating technology advancement
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- Educating volunteers for community service



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