Obio Soybean News

Biotechnology

Changes the Face of Agriculture See page 14

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The Ohio Soybean Council was founded in 1991 to manage the Soybean Research and Promotion Program, commonly referred to as the soybean checkoff. Soybean farmers pay one half of one percent of the bushel price to the soybean checkoff when they sell soybeans. Half is sent to the United Soybean Board and half is invested right here in Ohio in soybean production research, marketing and promotion, new product

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Obio June-July 2016 • Vol. 6, No. 3 South of the Obio Southern Association



5	Biodiesel Ranks First Among Fleets for Alt Fuel Use
6	Join the Ohio Soybean Association!
9	Banding to Protect the Basin
10	U.S. Senate Passes Bill Barring Army Corps of Engineers From Dumping Polluted Sediment into Lake Erie
14	Cover Story: The 1990s Greatest Hits
17	Ohio's Changing Phosphorus Risk Index
18	Panama Canal Expansion Opening this Summer
19	Ohio Soybean Council Foundation Awards \$36,500 in Scholarships
20	Soy-PK: an Innovative Replacement for BPA
21	Ohio Crop Producers Needed For Yield Survey!

22 TECH TALK: Can You Hear Me Now?



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June-July 2016

Perspective



Tommie Price Ohio Soybean Association Chairman Putnam County soybean farmer

he 2016 growing season is here and it's no secret that Ohio experienced unseasonably wet conditions. The warmer temperatures near the end of May brought dryer fields, and many farmers took advantage of the weather and caught up on planting. I read that across Ohio during the last week in May only 22 percent of soybeans were planted. There is always a lot of pressure to get planting, but the fun part is coming as we wait for the weather this summer and anticipate yield numbers. Profit margins are tight; so high yields are at the top of everyone's mind. While the weather can be a challenge, there is no way to completely eliminate risk.

There are many other factors that play into a successful crop year. According to field crop experts, row spacing is also a consideration. While farmers should plant soybeans in narrow rows, between 7.5 to 15 inches, it's even more important to adhere to narrow rows when planting in June. That way, they can have adequate canopy closure, which increases light interception, improves weed control by shading out weeds, and helps retain soil moisture.

While planting is wrapping up, I want to remind you of the special insert the Ohio Soybean Association and Ohio Soybean Council has included in the magazine. As OSA celebrates 50 years and OSC celebrates 25, there is lot to reflect upon and the article in this issue focuses on the '90s. Be sure to check out page 14 to read more.

Finally, I wish you a safe and profitable growing season this summer.

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Ohio Soybean news is published six times a year by the Ohio Soybean Association, 918 Proprietors Rd., Suite A, Worthington, OH 43085. Phone: 614-476-3100. For address corrections contact Ohio Soybean News at 918 Proprietors Rd., Suite A, Worthington, OH 43085.

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Biodiesel Ranks First Among Fleets for Alt Fuel Use

New Fleet Survey Reveals Biodiesel is Top Option for Current Deployment and Future Interest

orth America's top fleets have spoken, and their number one choice for greening their fleet operations is biodiesel. According to a new 2016 Fleet Purchasing Outlook study conducted by the NTEA — The Association for the Work Truck Industry — biodiesel is now the most commonly used alternative fuel option on the market. Survey data shows 18 percent of fleets use biodiesel now — up from 15 percent in 2015. And in terms of future alternative fuel interest, biodiesel also takes top honors, with more fleets planning to acquire or continue using biodiesel than any other alternative fuel option.

Each December, NTEA conducts a comprehensive Fleet Purchasing Outlook Survey to better understand the commercial vehicle landscape, including interest levels for advanced truck technologies and alternative fuels. The new survey results for 2016 were published in March and reflect positive trends for the use of biodiesel blends in the diesel vehicle technology of yesterday, today and tomorrow. truck applications. From government and municipal fleets, to construction, delivery and utility sectors, to agriculture and private industry sectors — fleets from coast to coast are relying on the power and performance of biodiesel, America's Advanced Biofuel, to get the job done.

Doyle Sumrall, Managing Director of NTEA, commented, "The evolution of alternative fuel technologies is still triggering change for vocational truck specifications. However, general interest has dropped in recent years due to persistently low oil costs and will likely remain muted until prices rebound. Despite current challenges facing the alternative fuels movement, fleet interest in biodiesel has remained strong, actually increasing in 2016 as compared to the previous year."

Fleets are realizing that biodiesel continues to be an easy and cost-effective way for them to cut carbon and improve the performance and sustainability pro-



Spanning the United States and Canada, the 2016 Fleet Purchasing Outlook Survey respondents included a diverse pool of fleet professionals representing a broad range of fleet sizes, vehicle weight classes and vocational file of their fleet operations. That has certainly been the case for the City of Moline in Illinois, which has operated its full fleet of over 102 diesel vehicles and equipment on B20, a 20 percent blend of biodiesel with ultra-low sulfur diesel, since 2006. In everything from fire trucks and ambulances, to trash trucks and tractors, the B20 biodiesel blend has helped

Moline enhance the performance and minimize the maintenance of its vehicles' fuel systems — all at a lower cost than diesel fuel and without a single fuelrelated maintenance incident in the ten years of its use in their fleet. J.D. Schulte, Fleet Manager for the City of Moline, stated, "Here in Moline, air quality is paramount to our quality of life. We made the switch to clean, domestically produced plant-based biodiesel ten years ago, not only because it was a good choice for our fleet, but also because it



was a good choice for our community. My advice to other fleet managers is, if you are conscious of and serious about air quality and looking for an easy and cost-effective solution to make a positive difference in your community, biodiesel is a natural choice."

Made from an increasingly diverse mix of resources such as soybean oil, recycled cooking oil and animal fats, biodiesel is a renewable, clean-burning diesel replacement that can be used in existing diesel engines. It is the first and only commercial-scale fuel produced across the U.S. to meet the EPA's definition as an Advanced Biofuel — meaning the EPA has determined that biodiesel reduces greenhouse gas emissions by more than 50 percent when compared with petroleum diesel. In the Gross Vehicle Weight Class 5-8 vehicles that account for 92 percent of on-road diesel / biodiesel fuel use, nearly 90 percent of the medium- and heavy-duty truck OEMs support the use of B20 biodiesel blends.



Join the Ohio Soybean Association!



Ohio Soybean Association

The mission of the Ohio Soybean Association (OSA) is to provide leadership for Ohio's soybean farmers in promoting effective policies and legislation to ensure a growing and profitable soybean industry. OSA represents its members at both the state and federal levels, and works cooperatively with its national affiliate, the American Soybean Association.

Soybean checkoff dollars, managed by the Ohio Soybean Council, cannot be used for lobbying and legislative activities. That is why your OSA membership is vital to making the soybean industry in Ohio successful and profitable for years to come.

Fill out an application to become an OSA member today or join online at www.soyohio.org/membership.

Questions? Call 614-476-3100.

NEW: OSA has partnered with DTN/ *The Progressive Farmer* to bring you these special member benefits.

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For more information about OSA, visit www.soyohio.org/membership, or call 614-476-3100.

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No Substitute for Scouting

3 tips to help you get the most from scouting

You can't fix problems in your fields if you don't know what's out there. Scout your fields once a week to check for stand issues, insects, diseases and weeds. Here are a few tips:

1. Walk your fields.

While drive-by scouting is faster, this method won't allow you to see problems until it's likely too late to stop the damage. Check several areas of the field as problems in one section may or may not be present in others.

2. What should you look for?

At the early stages of soybean growth, look for issues with population or plant stands. It may not be too late to replant those spots. As the growing season progresses, be on the lookout for diseases, insects and weeds.

3. When you do find a problem, don't be tempted to manage all your fields the same way.

Treating fields on an individual basis may prevent you from applying unnecessary treatments. As most farmers face smaller profit margins this year compared with recent years, this individualized treatment can make a big difference on your bottom line.

Visit *www.UnitedSoybean.org* for more information on pest management in soybeans.





Banding to Protect the Basin

Ohio Farmers Mindful of Water Quality

he Stickel brothers have always been mindful of the value and importance of preserving water quality in the Western Lake Erie Basin. Together, Andy who serves on the Ohio Soybean Association (OSA) board of trustees and his brother Brian represent the third generation to farm the northwest Ohio family's fields that lie 20 miles south of Toledo. And they've learned banding fertilizer is one solution.

"The basin is always on our minds. Our nutrient use is constantly monitored to ensure proper application and effective use," said Andy Stickel, who added

that agriculture is not the only industry contributing to water quality issues. "Agriculture is taking the brunt of regulations, so this is front and center with us. The Toledo suburbs are 10 minutes north of our farm and keep creeping closer, so we have to anticipate potential issues."

Andy and Brian's parents, Dale and Mary Elyse, are part of the diversified farm. The family raises corn, soybeans and wheat using primarily no-till and grows processing tomatoes. They also have a commercial cow-calf herd and finish about 400 head of cattle per year in a feedlot. A custom hay and straw business makes up the rest of the enterprise.

"We try to be good stewards. We minimize phosphorus and potassium applications and use nutrients on a field-by-field prescription basis," Stickel said. "We soil test every two to three years with an agronomist's help and do variable rate applications based on soil tests and yield history."



The Stickels band-apply fertilizer in corn and soybeans. They have primarily heavy clay soils and use stabilizers, especially with phosphorus applications. Corn is planted in 30-inch rows between the fertilizer bands and soybeans are planted in 15-inch rows right next to the bands.

"Banding helps our bottom line and our efficiency," Stickel said. "We are testing cover crops to improve soil health and water quality, too. We fly rye seed over our corn. The following year we plant soybeans, followed by wheat and a summer cover crop."

The family is stepping up sustainability efforts in the livestock arena. New state legislation regulates fertilizer and manure applications in the basin, but exemptions include injection, incorporation within 24 hours and when applied on a growing crop, including cover crops. Stickel can now haul manure for cover crop use at different times of the year. Andy and Brian Stickel band-apply fertilizer in corn and soybeans to help their efficiency and protect water quality. They are testing cover crops and looking into composting as a future option for sustainability.

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For the future, the Stickels are evaluating composting as another option. "We want to keep everything in balance and maintain soil health for maximum water-holding capacity," he said.

Stickel recommends other farmers take a holistic approach to protect water quality. "Fresh water is a major asset. There are no right or wrong answers to protect it. Be aware of your actions, and tackle sustainability from environmental and economic perspectives," he said. *Article provided by the American Soybean Association.*



U.S. Senate Passes Bill Barring Army Corps of Engineers from Dumping Polluted Sediment into Lake Erie



he U.S. Senate passed an energy and water appropriations bill that included a provision inserted by Ohio Sens. Sherrod Brown and Rob Portman that prevents the U.S. Army Corps of Engineers from dumping polluted dredged sediment directly into Lake Erie.

Over the past year, the Army Corps has been engaged in a federal lawsuit against the Ohio EPA and the Port of Cleveland seeking permission for openlake dumping. The agency contends the sediment is clean enough to dispose directly into the lake.

U.S. District Court Judge Donald

Nugent blocked the Army Corps' request last year, and ordered the agency to dump the dredged sediment into a confined containment dike as it has for the past 40 years.

"It's essential to the Port of Cleveland and Northeast Ohio businesses that the navigation channel of the Cuyahoga River is maintained," Brown said in a news release. "While dredging is critical for the region's economy, it shouldn't compromise efforts to improve water quality and restore the health of the lake." Portman said: "The Cleveland Harbor project is vital to all of Ohio and we A recently passed U.S. Senate bill will prevent the Army Corps of Engineers from dumping polluted sediment dredged from Cleveland Harbor directly into Lake Erie.

must ensure that the dredged material is not inappropriately disposed of by dumping it in Lake Erie without approval by the Ohio EPA. I will continue use every tool available to make sure both the City of Cleveland's water supply and Lake Erie's ecosystem is protected."

Brown's and Portman's language in the bill ensures that open-lake dumping can occur only if strict environmental standards set by the Ohio EPA are met. Earlier this year, the Ohio EPA declined to grant the Army Corps a permit for open-lake dumping, citing tests that found the sediment in the shipping channel too polluted with PCBs to dispose of in the lake.

Meanwhile, Portman is heading a Senate subcommittee that is investigating allegations that the Army Corps deliberately cut more than \$3 million budgeted for dredging Cleveland harbor from its 2016 federal appropriation. Afterward, the Corps claimed it didn't have enough money to dispose of the sediment in containment dikes.

Port of Cleveland President and CEO Will Friedman told Portman that the Cleveland Harbor dredging project was the only example where the Army Corps asked Congress for a cut in funding in the lower 48 states last year. *Article Provided by the Plain Dealer.*



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One of the Beck's Young Farm Leaders will be selected as the 2016 Beck's Young Farm Leader of the Year and receive a trip for two (\$2,000 value) to the 2017 Commodity Classic in San Antonio, Texas. Beck's Young Farm Leaders may also be chosen to attend Ohio Soybean Association and/or Beck's Hybrids leadership training programs, board meetings, events and other relevant activities.

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The year 2016 marks the 25th anniversary of the Ohio Soybean Council (OSC) and soybean checkoff and the 50th anniversary of the Ohio Soybean Association (OSA).

OSA was founded in 1966 to provide leadership for Ohio soybean farmers in promoting effective policies and legislation to ensure a growing and profitable soybean industry.

Since 1991, OSC's vision has been to assure the longterm viability of Ohio soybean farmers. OSC invests soybean checkoff funds to maximize farmer profit opportunities.

To commemorate both anniversaries, the *Ohio Soybean News* will publish a special series that recounts the story of soybeans in the U.S. and Ohio, as well as reflects on the notable moments in the history of OSA and OSC.



The 1990s Greatest Hits

Technology rocks the Ohio soybean landscape.

Rock-and-roll revolutionized the music scene in the 1940s with the introduction of new technology like the electric guitar, the 45 rpm record and the microphone. So popular was the music genre, that Cleveland welcomed the Rock and Roll Hall of Fame in 1995 as a tribute.

Similarly, high-tech tools like the gene gun and precision technology revolutionized the agricultural scene during the 1990s. Ohio soybean farmers also welcomed the gamechanging national checkoff in 1991, which provided an influx of funding for market and production research and promotion.

"Success came because Ohio farmers who served in leadership roles then always looked at everything progressively. They were willing to invest in their future by funding projects that needed time to work, but were good bets to pay off in the end," says John Lumpe, who worked with the Ohio Soybean Association (OSA) and Ohio Soybean Council (OSC) in several capacities from 1991–2009. He served as executive director from 2004–2009.

National Checkoff Changes the Scene

Lumpe, along with Keith Stimpert, OSA executive director from 1987–1996, joined the state's soybean farmer leaders in reviewing and monitoring what would become the national checkoff. The Soybean Promotion and Research Checkoff (SPARC), which was passed by Congress as a provision in the 1990 Farm Fill, was implemented at onehalf of one percent of sales. Now some 25 years later, half of the funds collected through the checkoff still remain with each state and half goes to the United Soybean Board (USB) to fund national-level efforts.

"Although we were never able to pass a state checkoff program under state legislation, the acceptance tone changed across the state when we made the effort to collaborate and work with farmers who had opposed a state program," says Stimpert. "Soybean profitability was a common goal, and working together with all parties helped us move forward under the national program."

With the checkoff, came creation of OSC. Several Ohio soybean farmers were instrumental in pulling in other supporters for the program, including Dennis Mesenberg, Roy Loudenslager, the late Bob Utz and the late David Younkman. They worked to bring farmers from Ohio farm groups in to write and support the next chapter on moving the soybean industry forward.

"One of the things I remember about being involved with farmers during the 1990s was the way board members were always engaged within their industry," says Lumpe. "There was camaraderie among farmers and even a celebratory sense when the national checkoff passed."

Lumpe attributes some of the success to the quality of board members at the time. Several were involved with enterprises besides farming, including real estate and floriculture. And Lumpe says that brought fresh perspective and talent into the mix.

Herbicide Resistant Soybeans Go Great Guns

As soybean farmers found a new path to fund more research and promotion, soybean production also was headed in a new direction. Soybean geneticists were discovering ways to accelerate the soybean improvement process to more quickly boost bushels per acre.

More specifically, researchers had learned how to take the DNA molecules containing soybean information and accurately use them outside of the traditional breeding process. Scientists could add one or more genes to soybean DNA by literally shooting the genes into plant cells with a special gun. Gene guns shot tiny metal bullets into plant cells that contained copies of the gene(s). Some of those copies would attach in the cell and added to the cell's DNA.

Roundup Ready soybeans were created using this method. The gene that

was added to soybeans came from a bacterium that made soybeans resistant to the herbicide glyphosate. Roundup Ready soybeans were introduced in 1994, and became commercially available to farmers in 1996. By 1999, more than 60 percent of the U.S. soybean crop was Roundup Ready. Today more than 90 percent of the crop consists of some type of herbicide-resistant variety.

Soybean Diseases Get Attention

Researchers also devoted a significant amount of time to soybean diseases during the 1990s, utilizing checkoff funds from both state and national organizations to enhance research opportunities. Anne Dorrance, plant pathologist, joined the staff at the Ohio State University in 1997 to perform furrow-to-labbench research with varieties, diseases, fungicides and resistance.

"One of the greatest challenges for Ohio soybean farmers revolved around the state's clay soils and the mold problems such soils can create. Another growing problem was soybean cyst nematode (SCN)," says Dorrance. "Some of these production problems were similar to other states, but many were unique to Ohio. We have been able to do a better job addressing those affecting Ohio farmers because the checkoff provides longevity and stability to our research."

Dorrance believes well-funded public research is the key to continued longterm soybean production success in Ohio, especially with regard to resistance issues. "We help farmers find out what is going on in their fields, identify any resistance and then work with them to manage it," she says. "This relationship is critical for the future of Ohio soybean production. As farmers face problems, they will not all be quick fixes."

Food-Grade Soybean Opportunities Rise

Another focus for Ohio soybean breeders during the 1990s was foodgrade soybeans. Soybean buyers from Japan and other parts of Asia had developed a preference for soybeans grown in Ohio, given naturally high levels of protein found in varieties grown in the state.

With checkoff funding, Lumpe remembers OSC working with Steve St. Martin, an Ohio State University soybean geneticist and breeder, who developed FG1, a food-grade variety. St. Martin created several tofu varieties specifically for the market. OSC hosted several trade teams, hired a consultant to represent Ohio farmers in Japan and began some branding efforts.

"Ohio FG1 was commercially released in 1994, and is still widely used for export markets today," says Lumpe. "We saw a lot more Ohio farmers begin growing food-grade soybeans for the Asian markets. Even the Japanese emperor had his tofu made from Ohio soybeans."

Bart Johnson, publisher for *Ohio's Country Journal* and Ohio AgNet, says media coverage of both food-grade soybeans and biotechnology were big issues at the time. "Biotechnology was a huge advancement for farmers that came with a great deal of savings," he says. "There was a lot of excitement around the possibilities the checkoff might provide."

Soybean Oil Is Industrial Focus

Soybean oil increasingly became an environmentally friendly alternative to petroleum oil applications during the decade, including printing inks, paints and industrial lubricants, but also as a supplement or replacement for diesel fuel. Long-term investments were made in soybased biodiesel, given the promise for its use in Ohio infrastructure and state fleets.

"New uses research was a big focus. We partnered with Battelle Memorial Institute on several projects and patents for industrial uses," says Lumpe. Battelle is a private, non-profit, applied science and technology development company in Columbus, Ohio. "OSC and Battelle have had many product success stories arise from their collaborations, including products that won R&D 100 Awards, which recognize the top technology products of the year."

Lumpe says Ohio soybean farmers were successful in getting biodiesel on



the state purchasing list. "Biodiesel research and development was a top priority," he remembers. "We also, for the first time, had the complementary relationship between OSA and OSC. We could do background research and promotion with checkoff dollars and then use that knowledge to pursue legislative biodiesel resolutions that were good for the state and our farmers."

Johnson's colleague Dale Minyo, a farm broadcaster for Ohio AgNet, drove the first biodiesel truck in partnership with OSC. Johnson says they would purchase 55-gallon drums of B100 and splash blend it with diesel to power the Dodge Ram pickup.

Other, more short-term energy was directed to soy foods promotion and the positive impact soy consumption had on women's health. The Food and Drug Administration (FDA) approved a new soy health claim stating that, "soy protein included in a diet low in saturated fat and cholesterol may reduce the risk of coronary heart disease by lowering blood cholesterol levels." Food labels carried that message, and farmers promoted soy foods to consumers.

Throughout the movement into a national checkoff program, Lumpe and Stimpert both remember that Ohio was well represented by its soybean farmer leaders. They were active in such national organizations as the American Soybean Association (ASA) and the newly created USB, and expanded their roles into organizations that evolved from checkoffrelated work, including the National Biodiesel Board (NBB), North Central Soybean Research Program (NCSRP) and later the U.S. Soybean Export Council (USSEC).

"The farmer leaders have built a strong organizational foundation in Ohio," says Kirk Merritt, current OSC executive director. "That foundation has served Ohio soybean farmers well over the years and will continue to do so as we meet new challenges and take advantage of new opportunities. The current leadership is focused on carrying the mission forward and I'm very excited to be a part of that future."

OSC and OSA are also focused on building the next generation of leaders. "Our organizations have had tremendous success over the years, but we never stop there," says Adam Ward, current OSA executive director. "Like every Ohio farmer, we work to leave our organization better than we found it and set the next generation of leaders up for success."

The 1990s were a decade of technology adaptation, production research and customers. In the next issue of *Ohio Soybean News*, farmers turn the page to a new century with fresh opportunities to expand markets for soybeans and soy products both in the U.S. and abroad.

OHIO SOYBEAN DAY AT THE FAIR SATURDAY, AUGUST 6TH, 2016

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Ohio's Changing Phosphorus Risk Index

Rarmers are caretakers of the land. While growing crops from the soil, they monitor its health and add nutrients as needed. In turn, they have been held increasingly responsible for the water that passes over and through their fields and what that water carries with it as it goes.

According to researchers at Ohio State's College of Food, Agricultural, and Environmental Sciences, phosphorus tops the list as the nutrient most often implicated in the degradation of surface water and contributions to algal blooms. While agriculture is not the only source of phosphorus, the industry recognizes its need to take action and be part of the solution, including an industry collaborative project called "On-Field Ohio!"

"Phosphorus is increasingly being used to judge farmer performance, so we have to get it right. Farmers are willing to make changes, but the recommendations need to be based on science," said Dr. Elizabeth Dayton, a soil scientist at Ohio State and principal investigator for the On-Field Ohio! project, which is part of the University's larger Field to Faucet initiative.

Dayton is working on the data and scientific basis needed to rewrite the Ohio Phosphorus (P) Index that is intended to provide a field-scale estimate of P runoff risk based on characteristics (such as degree of slope or soil type) and crop management practices (current P levels, fertilizer applied, application method and tillage).

Research efforts are focused on areas where the farmer has some control, looking more at the concentration than the total volume in the runoff events of more than 29 surface and/or tile drainage monitoring sites. Sites are located across farms in Ohio's current priority watersheds — the Scioto, Grand Lake St. Mary's and Western Lake Erie Basin.

Runoff events are classified as either baseline events, associated with year

round runoff activity, or spike events, associated with short-term high-risk events, for example, major rainstorms, tillage, or surface fertilizer application.

Presently the project has more than 2,000 recorded run-off events that have generated more than 14,000 water samples with more than 42,000 water analyses. In addition, the project has collected 2,000 soil samples and performed 8,000 soil analyses. The data will continue to accumulate as the study progresses.

"The edge-of-field studies were always intended to be long term, but we're hoping to summarize where we are to suggest a preliminary revision for the P Index, this year" said Dayton.

The P Index also utilizes the Tri-State Fertility Guidelines — currently being studied for revision by Dr. Steve Culman also at Ohio State which would be considered in the P Index results. Current data suggests huge benefits come from banding or injecting fertilizer instead of surface application, but keeping P levels within the Tri-state recommendations also keeps dissolved P concentrations low. Particulate bound P can be reduced by reducing tillage and maintaining field surface.

On-Field Ohio! is supported in part by Ohio farmers through the Ohio Soybean Council (OSC), Ohio Farm Bureau Federation, Ohio Corn Checkoff, Ohio Small Grains Checkoff and many other agricultural organizations.

"Water quality is important for our state; we depend on these resources for recreation, tourism, jobs and a healthy ecosystem. Farmers want to be part of the change that puts us closer to a solution and this study is a key component of that journey," said Terry McClure, OSC Chairman and soybean farmer from Paulding County.

Edge of field monitoring stations like the one pictured below help collect water samples and data to determine the concentration of substances present such as phosphorous. PHOTO: DAVID TOMASHEFSKI





for larger ships as well as a third set of

age of today's cargo ships and remain

the global economy has been trans-

crossing our oceans carrying much

exceed the capacity of the Panama

relevant in global commerce.

locks to accommodate a higher percent-

"Clearly ocean transportation and

formed significantly since the original

canal was open. There are larger ships

more volume than years ago and these

ships have grown to a point where they

Canal," said Jeff Magyar, Ohio Soybean

Council (OSC) board member and Soy

Transportation Coalition (STC) board

Construction began in 2007 and after



Panama Canal Expansion Opening this Summer

hio soybean exports have topped more than 2 billion bushels in recent years - equal to half of the state's production — making logistics and infrastructure a critical part of the industry. While infrastructure in Ohio itself is important, more than 600 million bushels that leave the state also pass through the Panama Canal, which has played a major role in maritime trade by connecting the Atlantic and Pacific Ocean for more than 100 years.

Since opening in August of 1914, the canal, as well as the system of locks and dams have simply been maintained, while the size of cargo vessels has continued to increase in width and depth. In 2006, the people of Panama passed a referendum to



add a new entrance

a few setbacks, the expansion is slated to open June 26, 2016. In addition to the third set of locks and entrance channels, channel the project deepened and widened The Panama Canal was established in 1914 to expedite shipping to and

member.

current areas of the canal as well as from the Atlantic and Pacific Oceans. expanded Originally run by the United States, the artificial management transitioned to the lake that is Panamanian government in 1999. integral to the

The expansion project greatly increases the capacity of ships travelling through the canal allowing a significant increase in the amount of soybeans that can be exported in a single trip.

gravity-fed system. After expansion, the canal can accommodate larger ships and heavier loads. Previously, ships up to 106 feet wide with a 39¹/₂ foot depth could be accommodated, while the new locks will handle boats up to 160 feet wide with depths up to 50 feet.

"You can put more revenue producing freight in the ship for a given cost of transportation," said Mike Steenhoek, Executive Director of STC. "We think it will improve the economics of US soybean exports, and we need any help we can get. Any opportunity to remove cost from our transportation system, which the Panama Canal can do, will help preserve the competitiveness of our industry."

In addition to being a critical part of soy transportation, the canal expansion serves as a tangible example of the need to repair and improve Ohio's own infrastructure. Several staff and board members from OSC visited the Panama Canal with STC in December 2015 and will use the experience to continue the conversation in Ohio on the importance of maintaining and updating our current inland waterway systems.

"There's not a lot we can do about what happens in Panama, but there's a lot that we can do about what happens in the United States. So becoming more familiar and developing greater knowledge of this expansion project should help us to increasingly insist upon investments and enhancements in our infrastructure," added Steenhoek."If the links in our logistics chain that lead up to the canal — our roads, inland waterway system, locks and dams - if those aren't strengthened then the Panama Canal expansion will be a missed opportunity. When one link in your chain gets stronger you need to strengthen those other links as well."



Ohio Soybean Council Foundation Awards \$36,500 in Scholarships



The Ohio Soybean Council Foundation (OSCF) recently announced the scholarship recipients for the 2016–2017 academic year.

This is the ninth year for the OSCF Scholarship Program, which was created to encourage undergraduate students to pursue degrees in one of the many academic fields that support the future of the soybean industry including agriculture, business, communication, economics, education, science and technology, as well as to support ongoing graduate-level research.

Undergraduate scholarships of \$3,000 each were awarded to Nathan Hager, Summer McCracken, Jarret O'Neill, Anna Schmenk and Ben Shaw. Due to graduating in December 2016, Kara Short will receive a partial scholarship of \$1,500. The annual Farmer, Lumpe + McClelland (FLM) Scholarship, awarded to students in the field of agriculture communications or business, was awarded to Leah Schwinn. The annual \$5,000 Bhima Vijayendran Scholarship, named in honor of a Battelle research scientist who has made tremendous contributions to the soybean industry, was awarded to Rachel Krebs.

Three graduate scholarships of \$4,000 were awarded to Bill Rolling, Stephanie Verhoff and Ashley Yates.

"Congratulations to the 2016–2017 OSCF scholarship recipients," said Amy Sigg Davis, OSC board member, soybean farmer from Warren County and scholarship selection committee member. "The students are extremely bright and will no doubt make an impact on the Ohio soybean industry in the future. The OSCF is very pleased to honor these outstanding students."

Undergraduate Winners:

Nathan Hager of Wapakoneta, Ohio is a junior at The Ohio State University (OSU) studying Chemical Engineering.

Rachel Krebs of Gahanna, Ohio is a sophomore at the University of Dayton studying Chemical Engineering.

Summer McCracken of Anna, Ohio is a junior at OSU studying Agribusiness and Applied Economics.

Jarret O'Neill of Rockford, Ohio is a junior at OSU studying Agricultural Systems Management. **Anna Schmenk** of Leipsic, Ohio is a sophomore at OSU studying Food Science and Technology.

Ben Shaw of Clyde, Ohio is a sophomore at OSU studying Agronomy.

Leah Schwinn of New London, Ohio is a junior at OSU studying Agricultural Communication.

Kara Short of Conover, Ohio is a junior at Wilmington College studying Agronomy.

Graduate Winners:

Bill Rolling of Columbus, Ohio is pursuing a Ph.D. in Plant Genetics at OSU. His research revolves around understanding genetic resistance to soybean pathogens and abiotic stresses. His current project is focused on studying resistance to Phytophthora sojae and understanding how partial resistance is conferred, what types of genes are involved, and identifying sources of this type of resistance.

Stephanie Verhoff of Radnor, Ohio is pursuing a Ph.D. in Plant Breeding at OSU. She is currently characterizing a novel source of resistance to Phytophthora stem and root rot in soybeans to assess and increase its potential to be incorporated into soybean breeding programs and identify candidate genes conferring resistance.

Ashley Yates of Wooster, Ohio is pursuing a Ph.D. in Translational Plant Sciences at OSU. Her research goals are to better understand the molecular mechanisms, including genes and proteins, which enable the soybean aphid to overcome soybean resistance. By examining the differences between avirulent and virulent aphids at two molecular levels, she will better understand the mechanisms of overcoming resistance.



Soy-PK: an Innovative Replacement for BPA

I n 2015, the Ohio Soybean Council (OSC) announced the development of a soy-based coating with the potential to replace Bisphenol A (BPA) coatings in consumer products. Many food packaging companies have been working to find alternatives to BPA since research has proven its potential to release chemical toxins over time. A recently released "buyer beware" study continues to raise health concerns around BPA as well as many of the coatings companies are turning to as alternatives.

According to Barry McGraw, OSC's Director of Product Development and Commercialization, OSC is in a great position to license this soy-based technology as a viable solution for all sectors of the food and beverage production and packing industry.

"It's great timing with respect to market trends and consumer demands. We have the potential to fill that gap for food production companies — such as canned food, beer or soda companies who are looking for alternative coatings that perform as well as BPA does with their products," said McGraw.

Since the coating was developed last year, in cooperation with innovation partner Battelle, OSC has filed a patent application and has set the commercialization process in motion by providing product samples to potential licensees through contacts made from conference presentations, press releases and in person company meetings in the US as well as around the world.

Evaluations have been encouraging as many samplings have resulted in additional requests for material on larger scale trials.

"It's really encouraging from a commercialization standpoint — that large commercial organizations are impressed with the performance and want to continue trials," said Terry McClure, OSC chairman and soybean farmer from Paulding County. "Based on its chemis-



try, technical performance, and toxicology results, Soy-PK should not only be better than BPA, but it also performs better than other bio-based alternatives while remaining cost effective."

Research and development on the resin has shown its potential to provide excellent corrosion resistance for aluminum and steel cans — a key factor and reason for most coating uses — with highly acidic food and beverages.

Soy-PK also dries quickly which allows production facilities to maintain line speeds when spraying or applying the coating to food or beverage containers. These attributes will assist OSC in marketing the technology to different levels of the packaging industry value chain; and there are a lot of levels involved in packaging — resin companies, coating companies, can companies and the companies that make the actual products being packaged.

"We are proactively marketing it by presenting at conferences, visiting OSC has provided samples of the soy-based coating for companies to run trials with their specific products and evaluate performance and potential for wide scale use.

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large coating companies, and sending out letters, information and samples to companies that could benefit from this soy based technology. We've been in touch with the top ten chemical and coating companies and continue to reach out to a worldwide audience," said McGraw.

"It's exciting to think that in the near future, you could pick up a can to take a drink and know that the inside coating protecting the beverage from the metal could contain a soy-based product that was developed on behalf of Ohio soybean farmers. We're excited to see the ways this product can be used and the benefit it brings to consumers while creating demand for soybeans," said Nathan Eckel, OSC research committee chair and soybean farmer from Wood County.



Investing Checkoff Dollars



Dear Ohio Crop Producers:

I am embarking on a State-Wide Project aimed at generating some baseline producer data on current soybean management practices in Ohio's production systems. This project is funded by the Ohio Soybean Council and the North Central Soybean Research Program (NCSRP). The project goal is to identify the key factors that preclude the State's Soybean Producers from obtaining yields that should be potentially possible on their respective individual farms. The term used for the difference between what yield is possible on your farm each year and what you yield you actually achieve is called a "Yield Gap".

We are therefore asking Crop Producers in Ohio to provide us



Ohio Crop

Producers Needed

For Yield Survey!

OHIO SOYBEAN PERFORMANCE

RIALS

with yield and other agronomic data specific to their soybean production fields. With that data, we could then conduct an in-depth analysis of what on-farm factors might be causing a Yield Gap on producer farms. We intend to provide annual reports to all crop producers informing them of what factors we may have identified that, based on our analysis of the data collected from farms, are likely limiting you from achieving soybean yields closer to yield potential that is likely possible on your farms!

Specifically, we are requesting yield and other data specific to two 2015 fields of soybean and also two 2014 fields of soybeans, that YOU grew on your farm. We recognize that you may best remember the yields and related agronomic data for the 2015 season because you just harvested those fields within the past few months. However, we would very much appreciate additional data in the last two columns of the Survey Form for two 2014 soybean fields on your farm. If you cannot recall or do not have data for any given cell in the columns shown on the Survey Form, leave them blank.

We look forward to receiving your data. Keep in mind that all data submissions will be kept strictly confidential. In this project, our objective is to WORK FOR YOU. Our goal is to use the data YOU supply to help YOU get soybean yields on YOUR farm fields that, in the future, will be closer to the potential soybean yields that are possible on those fields, once you know what production system factors are holding back YOUR current soybean yields. To participate in the survey, visit www.surveymonkey.com/r/ohiosoybean

Sincerely,

Dr. Laura Lindsey Soybean and Wheat Extension Specialist 614-292-9080 lindsey.233@osu.edu



TECH TALK: Can You Hear Me Now?

ell phones and tablets play an important role in our daily lives. We use them for everything from driving directions to alarm clocks to cameras. At the farm level, these play an even more important role. Many farmers use mobile devices to check market prices, read ag news, make business phone calls and emails, and maintain records. Almost all ag businesses have mobile sites that can be accessed from mobile devices. There are a growing number of apps available that are relevant to farmers. For example, there are weather apps that allow you to check the weather at a specific farm. There are apps from grain companies that allow you to view and settle contracts. There are apps that provide live market updates. There are apps that store all of your farm business data, allowing you to manage on the go. Some farms even use apps and cell phones as a way to manage their employees and assign them tasks and

track progress. In a study conducted by the Ohio Soybean Council, 80% of the farmers surveyed said they obtain information about the markets and grain prices electronically, with most of them checking on a daily basis at least. (see figure 1).

Troubleshooting

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Farmers are also using cell phones and tablets as a way to troubleshoot problems. If something breaks on a piece of

Figure 2. Ohio's 4G Coverage. There are still many pockets with no cellular coverage in Ohio, many of them in remote areas.



Figure 1. 80% of farmers surveyed said they obtain information about grain elevators electronically.

equipment, it is much easier to snap a photo and send it to the dealer than wait for them to come out and take a look. It is also a way to take a picture of a given part so you can ensure you have the correct one, instead of guessing or going by memory. Cell phones provide a way for a farmer to look up common issues and solutions for equipment. We have become so dependent on mobile technologies, such as tablets and smart phones, that when we misplace them, we often feel "lost".

Overall, Ohio has good 4G cellular coverage. According to opensignal.com, Ohio's 4G coverage is 3% better than the national average, and 91% better than the worldwide average. Most areas have at least some coverage by 4G networks. There are still pockets that do not have service, and they tend to be remote farming areas. One industry expert said, "Sporadic coverage will limit advanced technologies from being used. We don't farm major roads and highways, away from that there is the worst coverage." (See figure 2).

What's Ahead

Until the state of Ohio and/or mobile providers decide to increase their infrastructure in these areas, the use of mobile applications and tools for agricultural





purposes may be limited. 4G LTE networks give users anywhere from 3 to 30 megabits per second (mbps) of download speed. To put that in perspective, the federal definition of broadband internet is 25 mbps. While the current mobile network coverage seems fairly adequate, in more rural areas slower speeds will limit access to and usability of many applications. Additionally, in the future, we could see a strain or decrease in effectiveness as we increase our use of these networks with technologies like the ones outlined below.

There are much more advanced farm technologies that rely on the same wireless cellular networks that connect our phones and tablets to the internet. Things like wireless cloud data transfer, unmanned aerial vehicles, and remote sensors all utilize mobile broadband to function. In the case of wireless data transfer, a farmer can have their yield and diagnostic data go directly to the cloud from the combine or tractor in real time, without having to transfer it via a USB drive. The combine or tractor will be equipped with a 3G cellular modem that will utilize cell phone networks to transfer the data. One industry expert said "the tractor needs at least 4G capability. The size of these transfers is huge. Say a farmer has a 60 acre field, that's 100KB

of data going back and forth constantly." Unmanned aerial vehicles, or drones, utilize wireless networks to feed the videos, photos, and data it collects back down to the operator in real time. The amount of data generated per acre continues to grow as the quality and quantity of data collected increases. Currently, a 100 acre corn field generates about 1.4 gigabytes of data per growing season, however, in the future that number could grow to over 14 gigabytes per season (equal to 7 hours of HD film!). That's 10 times the data per season, which could put a strain on the cellular networks that support them.

Another key use of cellular networks is for global positioning systems (GPS). Real Time Kinematic (RTK) systems are a form of satellite navigation that is ultra-precise, down to sub-inch accuracy. Farmers use RTK networks to power auto steer, precisely plant crops and apply fertilizer, and generate yield maps. In the past, the RTK system required a line of sight to deliver the radio signal. Manufacturers are now relying on cellular networks to deliver the RTK signal, improving operational accuracy and connection reliability. Cellular RTK alleviates

Farmers use tablets and cell phones for a wide range of activities, including accessing grain prices, farm management software, weather, and troubleshooting to name a few.

••••••

signal interruptions caused by tree cover or hills/mountains. However, it is another pull on the cellular network system, and requires connectivity to function.

Imagine sitting in your farm office, being able to analyze exactly what is going on out in the field — yields, moistures, locations, hours, fuel levels, etc. from your tablet. The ability to make real-time decisions is quickly becoming a reality as technologies and

mobile internet access increases. As tablet and cell phone usage in the typical farming operation increases, so will our need for strong, reliable cellular networks.

Stay tuned — the next Tech Talk article will dive deeper into what you need to know about broadband and it's availability to Ohio farmers. ◆

Modern tractors are equipped with cellular modems that send data and diagnostic information to the cloud. They also may have RTK GPS receivers, which rely on cellular networks as well.



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