

Ohio Soybean News™

SEPTEMBER-OCTOBER 2016

A PUBLICATION OF THE OHIO SOYBEAN ASSOCIATION



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Ohio Soybean News

September–October 2016
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A PUBLICATION OF THE OHIO SOYBEAN ASSOCIATION

6 An Ohio Farmer's Perspective on TPP

8 Ohio Soybean Association Names Brian Hill and Pat Tiberi
Legislators of the Year

10 Jennifer Wilson-Oechsle of Van Wert County Named Beck's
Young Farm Leader

14 Value of U.S. Meat and Poultry Exports to
U.S. Soybean Producers

18 COVER STORY: New Century Niches

21 Soybean Farmers Well Represented at Ohio State Fair

22 When is Natural Gas a Viable Option for Ohio Farmers?

24 Engineering a Future in Agriculture

25 The Flip Side of Farming, What's in the Soil

26 TECH TALK: Training and Learning in a Digital Age



COVER STORY: The Ohio Soybean Council (OSC) and Ohio Soybean Association (OSA) have carved innovative niches for the state's farmers in the new century. Unique soy-based products, including biodiesel, and soybean varieties created for Ohio use have provided new opportunities and new profitability streams.

See Page 18



The Tradition Continues ...
Tune in to listen to Dale Minyo,
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broadcaster.
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Tommie Price

Ohio Soybean Association Chairman
Putnam County soybean farmer

Hello, fall!

It's been a busy summer for the Ohio Soybean Association (OSA) and we just wrapped up our annual fundraiser for our Political Action Committee during the 2016 OSA Harvest Classic Golf Outing. Thank you to all of those who sponsored the event and who continue to support Ohio soybean farmers by supporting OSA.

Water quality remained a top priority this summer for OSA as well. In fact, OSA along with the Ohio Soybean Council (OSC) and

Ohio Corn & Wheat Association (OCW) recently hosted a news conference at the National Museum of the Great Lakes in Toledo, Ohio. Together, in recent years, we have invested more than \$3.5 million in water quality research and education. That research is now available and shows that Ohio farmers are doing their part to manage phosphorus and other nutrient runoff in the fields.

During the news conference, Dr. Elizabeth Dayton from The Ohio State University's (OSU) College of Food, Agricultural and Environmental Sciences provided progress observations and presented on-field data across 29 farm fields, 2,000 water samples and 42,000 data analyses since 2012. Here are a few key findings:

- ▶ Agricultural soil phosphorus levels are holding steady or trending downward in at least 80 percent of Ohio counties from 1993 through 2015.
- ▶ Soil nutrient testing is vital to determining the right amount and type of fertilizer needed for crops.
- ▶ Incorporating fertilizer into the soil through banding or injecting has the potential to reduce the concentration risk of phosphorus in runoff up to 90 percent under certain conditions.
- ▶ Tile drainage is an effective filtration system that can reduce soil erosion and prevent the loss of nutrients. In general, phosphorus concentration from tile runoff is less than in surface runoff.
- ▶ Current guidelines for phosphorus levels in soil established by Tri-State Fertilizer Recommendations appear to be on the right track.
- ▶ Nearly ¾ of phosphorus in surface runoff is attached to and travels with eroded soil sediment, making erosion control a key to phosphorus runoff control.

OSA, OSC and OCW also committed to a public education initiative to highlight the progress Ohio soybean farmers have made on water quality with newspaper ads, billboards in the Toledo area and digital content.

\$3.5 million is a huge investment and OSA wants to be sure the results are communicated to both farmers and the Ohio agriculture industry. THANK YOU for doing your part as we continue to put our best foot forward to manage runoff.



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An Ohio Farmer's Perspective on TPP



Adam Graham

One of the most talked about policies of 2016 is the Trans Pacific Partnership (TPP). TPP isn't an agreement that only affects agriculture and it's not without controversy.

However, when looking at the policy through the lens of soybeans and our number one customer, animal agriculture, the benefits are clear. According to a February 2016 report by the International Trade Commission, TPP is expected to create positive outcomes for the U.S., with the greatest gains to agriculture.

TPP involves twelve countries — all valuable markets for our products. If approved by Congress, TPP will eliminate tariffs on soybeans, soybean oil and soybean meal in all twelve participating markets, making the soybeans we grow here in Ohio an even more attractive product to customers that will be vital to us in the coming decades. It also contains provisions that would indirectly help soybean farmers with the elimination of barriers to value-added meat and poultry exports as well. As the demand for U.S. meat and poultry rises, so does the market for soybeans right here at home.

We will see advantages. Our children will see even more thanks to an even playing field in these top markets that represent 500 million potential customers and more than 40 percent of the global economy.

I find it's also telling that in such a polarized political climate, this is a policy that was created through a coalition of industry, and both Democrat and Republican allies. The Ohio Soybean Association, American Soybean Association and others will continue to push for Congress to take up this effort and approve it quickly.

As you consider your position on a wide variety of policies that affect your livelihood, I encourage you to voice your support to your legislator of TPP and the positive impact it will have on the future of Ohio's number one industry — agriculture. ♦

*Sincerely, Adam Graham
Logan County Soybean Farmer
Ohio Soybean Association President*

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IT'S TIME TO DIG DEEP

- Learn how to execute flexible marketing plans
- Hear how high-profit farms tap technology
- See what lenders expect on the credit front
- Gauge where land markets are headed next
- Get a post-election outlook on farm policy

2016 AG SUMMIT SCHEDULE OF EVENTS

SUNDAY, DECEMBER 4 PRE-EVENT OPTIONS

DTN University: Tax Solutions to Enter and Exit Ag

10-Year celebration reception with ag's most awarded Editorial Team

MONDAY, DECEMBER 5

7:30 a.m. Registration
7:30 a.m. Early Bird Profit Sessions/breakfast
12 p.m. Lite lunch with the sponsors
1 p.m. Ag Summit general session
6 p.m. Dinner at Fogo de Chão

TUESDAY, DECEMBER 6

7 a.m. Breakfast buffet roundtable discussions
8:30 a.m. Ag Summit general sessions
12 p.m. Plated luncheon
1:30 p.m. Ag Summit breakout sessions
5:30 p.m. Reception with the sponsors

WEDNESDAY, DECEMBER 7

7 a.m. Breakfast buffet roundtable discussions
8 a.m. Ag Summit general session
12 p.m. Adjourn

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Ohio Soybean Association Names Brian Hill and Pat Tiberi Legislators of the Year

The Ohio Soybean Association (OSA) named State Representative Brian Hill (R-Zanesville) and Congressman Pat Tiberi (R-Ohio) Legislators of the Year. OSA thanks Rep. Hill for his commitment to a science-based approach to water quality policy in Ohio and Congressman Tiberi for his tireless work on Trade Promotion Authority (TPA).

“Ensuring that Ohio farmers are a part of the water quality discussion and that any and all policies are science-based is a top priority for OSA,” said Adam Graham, OSA president and soybean farmer from Logan County. “Representative Hill is a farmer himself and understands what it takes. We thank him for his work to achieve both clean water and food production.”

Beyond guiding the nutrient management legislation (Senate Bill 1 & House Bill 59) through the House, Rep. Hill championed legislation that provides tax relief to farmers building manure storage by providing a tax credit (House Bill 297), and by championing the current agriculture use valuation (House Bill 398) legislation. Rep. Hill has shown his commitment to continuing to improve Ohio’s reputation as a state that supports agriculture and food production.

“The Ohio Soybean Association has been an instrumental resource to the



members of the legislature and I am incredibly honored to receive this award,” said Hill. “As we continue the tasks in front of us, I will remain supportive of this industry and appreciate our continued working relationship.”

Rep. Hill is in his second term as a member of the Ohio House of Representatives representing the 97th House District and is the current chair of the Agriculture and Rural Development Committee.

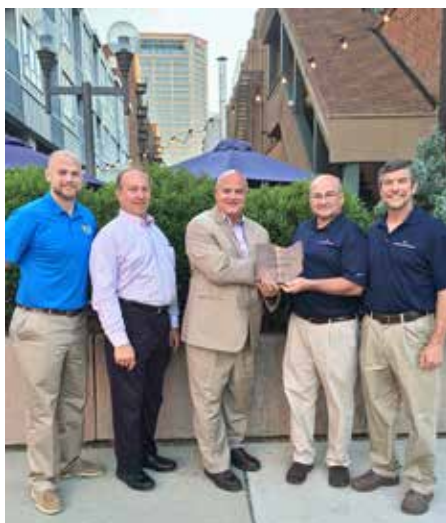
Congressman Tiberi has represented Ohio’s 12th congressional district since 2001 and serves on the House Ways and Means Committee.

“TPA is a priority for OSA and Ohio soybean farmers,” said Adam Graham, OSA president and soybean farmer from Logan County. “We thank Congressman Tiberi for his dedication to seeing TPA through, as well as his continued support for farmers and Ohio’s number one industry, agriculture.”

From left to right: Kirk Merritt, Ohio Soybean Council Executive Director, Allen Armstrong, Ohio Soybean Association (OSA) vice president, Scott Metzger, OSA board member and Adam Ward, OSA Executive Director thank Congressman Pat Tiberi (center) by presenting him with a plaque of appreciation.

“Ohio soybean farmers rely on free trade to expand exports and reach customers in new markets,” said Congressman Tiberi. “It is vitally important that our trade agreements work for them. That is why TPA was so important to pass — to ensure we get the best trade agreements possible so Ohioans can keep their farms open and running. I’m honored to receive this award, and I thank the Ohio Soybean Association for their work on behalf of our entire state.”

Legislative passage of the Trans-Pacific Partnership Agreement remains a high priority for the American Soybean Association and OSA. As the former chairman of the Ways and Means Subcommittee on Trade, Congressman Tiberi continues to provide the leadership needed to ensure this agreement works for Ohio farmers to promote free trade, protect workers and create jobs. ♦



From left to right: Adam Ward, Allen Armstrong, Tommie Price, OSA Chairman and Jeff Sollars, OSA board member thank Representative Brian Hill (center) by presenting him with a plaque of appreciation.

YOUR MEMBERSHIP SUPPORTS YOU HERE.



Ohio soybean farmers consistently rank state and federal regulation as their top concern. The Ohio Soybean Association (OSA) provides leadership for Ohio's soybean farmers in promoting effective policies and legislation. 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 cannot be used for lobbying and legislative activities. That's why your OSA membership is vital to making the soybean industry in Ohio successful and profitable for years to come.

**To learn more, visit
soyohio.org/membership.**



YOUR CHECKOFF SUPPORTS YOU HERE.



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 development and education to maximize profit opportunities for soybean farmers.

**To learn more, visit
soyohio.org/checkoff.**





Jennifer Wilson-Oechsle of Van Wert County Named Beck's Young Farm Leader

Farm families tend to have deep roots and become a part of their communities over the course of several generations. For Jennifer Wilson-Oechsle those roots have been growing for more than 150 years and make her part of the eighth generation to be involved on her family's Hancock County Farm.

With appreciation for the long line of farmers behind her, Jennifer looks to the coming years and the important role her generation plays in being a voice to shape the future of the industry. Her willingness to get involved, speak up and encourage others has led Jennifer to be chosen as a Beck's Young Farm Leader — a program focused on celebrating young farmers who are engaged in their communities and committed to the agricultural industry.

“We recognize the importance of the rising generation and the critical role they have in shaping our industry. They are facing tough issues and we encourage them to get involved as leaders in agriculture,” said Bruce Kettler, Director of Public Relations at Beck's Hybrids.

Recently married, Jennifer now resides with her husband in Van Wert County where they grow soybeans and corn in addition to holding jobs off the farm. After earning a degree in agricultural education from The Ohio State University, Jennifer worked at the Ohio Farm Bureau Federation (OFBF)



before transitioning into her current role as a loan officer with Farm Credit of Mid-America in Delphos, Ohio.

“I enjoy my role at Farm Credit and being able to work with farmers like myself who also work off the farm. I know the struggles they deal with and

Jennifer Wilson-Oechsle is part of the eighth generation to raise crops and livestock on the land that has been in the family for more than 150 years.

Photo: Danielle Stephenson, Farmstead Images.

the delicate balance it takes to make everything work,” said Jennifer.

Despite being a little over a county away, Jennifer maintains her involvement on the family farm where she got her start as a child watering animals in the barn before school. While her parents raise sheep, Jennifer and her brother eventually found their own niche with boar goats and maintain a small herd to sell for 4-H projects. Soybeans, corn and wheat are still in rotation on the land and feeder cattle can be found from late fall to early summer being raised for freezer beef.

With her dad being an Extension Agent, Jennifer grew up in a family dedicated to service and she has continued to find ways to serve wherever she goes. Currently, she serves as secretary for the Hancock County Farm Bureau Board, an auxiliary director for the Van Wert County Fair, a member of OFBF’s Young Ag Professionals Committee and a board member for the Ohio Soybean Association (OSA).

“Working at Farm Bureau I spent a lot of time guiding people in the right direction to talk to legislators, but was rarely on the other side of the table advocating directly for what we need,” said Jennifer. “Now I have that opportunity and realize it’s important for young farmers to keep our eye on hot topics, such as GMOs and understand we’re going to fight that battle more and more in coming years. We need to work toward a middle ground on issues that work for farmers and consumers; that has positives for both sides.”

Jennifer knows young farmers need to take an active voice in key areas as, especially as the nation moves closer to the presidential election that could mean big change for the farm bill and programs that protect farmers and help them sustain through hard years.

“It’s up to my generation to make sure we work with whoever our leaders are to safeguard the tools we need to be successful, especially when we need a fallback, whether it’s strengthening current programs or looking at new ones,” said Jennifer. “It’s also important that OSA and other commodity groups

make sure they are working to protect farmers as much as possible.”

One of the top struggles facing many of today’s organizations is maintaining and growing their membership base. While Jennifer herself is more involved than most, she acknowledges her generation tends to be “non-joiners” unlike past generations who were members of multiple organizations to show support.

It can be tough to get others involved, but Jennifer believes it revolves 100 percent around finding a passion in others; whether it is soybeans, international trade or other concerns. She strives to listen to peers and help them match their passions with the association or opportunity that is the best fit.

“I’ve been given the opportunity to advocate for Ohio soybean farmers and I am enjoying it. The only way we’re going to see positive movement is if people speak up for what we need in the industry, and there is no one better

equipped than us, as farmers ourselves,” said Jennifer.

“Jennifer clearly has a passion for the industry and is driven to take an active role in shaping its future. We are excited to see her involved and being recognized as a Beck’s Young Farm Leader,” said Adam Graham, OSA president and soybean farmer from Logan County. “She looks at the challenges facing young farmers in her generation and sees opportunities to move things forward for the industry. That attitude is essential for young farmers today and one reason we enjoy honoring young farmers and encourage more farmers to nominate themselves or someone they know for the Beck’s Young Farm Leader program.” ♦

Interested in applying or nominating someone for the Beck’s Young Farm Leader Program? Visit www.soyohio.org/becksyoungfarmlider.



NOMINATE AN OHIO SOYBEAN FARMER

(AGE 21-45) AS A BECK’S YOUNG Farm Leader

Each quarter, the Ohio Soybean Association and Beck’s Hybrids will select a Young Farm Leader to feature the individual’s leadership, both on and off the farm in Ohio agriculture publications.

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.

To apply or nominate someone, visit www.soyohio.org/becksyoungfarmlider





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Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

It is often said that “Farmers feed the world;” that statement could not be more true than when it comes to American agriculture. Ohio farmers, along with farmers across the U.S. work hard to produce quality crops and livestock. In fact, they do it so well that a large portion of our agricultural production is able to be exported to markets all around the world and U.S. soybean farmers play a substantial role.

Some foreign markets have long histories of trade with the U.S., while newer markets have been opened through efforts with the U.S. Soybean Checkoff. And in Ohio, the Ohio

Soybean Council (OSC) has utilized targeted marketing programs through the Ohio Soybean Checkoff to open pathways for Ohio soybeans.

International soybean trade happens in all forms, from raw grain to soybean meal or even meat products having been fed a grain diet. Recently, the United Soybean Board (USB) took a closer look at the amount of soybean meal exported as meat and poultry and the value those exports have brought to the soybean industry over the past 11 years — the numbers have been noteworthy.

Additionally, USB took a look ahead and projected export values for the

next 12 years; and their results show a bright future for the soybean industry. However, it’s hard to accurately predict the future and there are numerous factors that could impact those predictions. To account for some of those incidents, USB also ran several scenarios that would alter the main forecast and potentially impact that positive outlook.

.....
The U.S. is a world leader in meat and poultry production; and soybean farmers benefit because animal agriculture is their biggest customer.
.....



Worldwide, in 2014, the U.S. ranked #1 in beef production, #1 in broiler production, #1 in turkey production, and 3rd in pork production. As a result, U.S. farmers exported a significant portion of meat and poultry in 2014

21.2% of pork

Or 2.2 million MT, ranking as the top pork exporter in the world

10.5% of beef

Or 1.2 million MT, ranking as the fourth beef exporter in the world

**In 2014,
The U.S. Exported:**

19.1% of broilers

Or 3.3 million MT, ranking as the second broiler meat exporter in the world

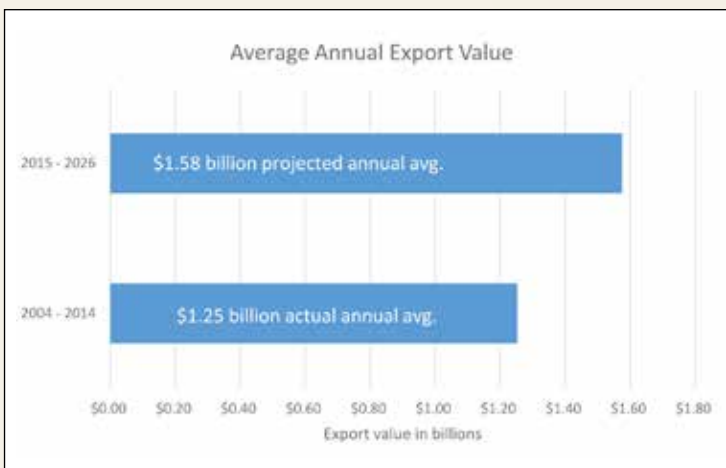
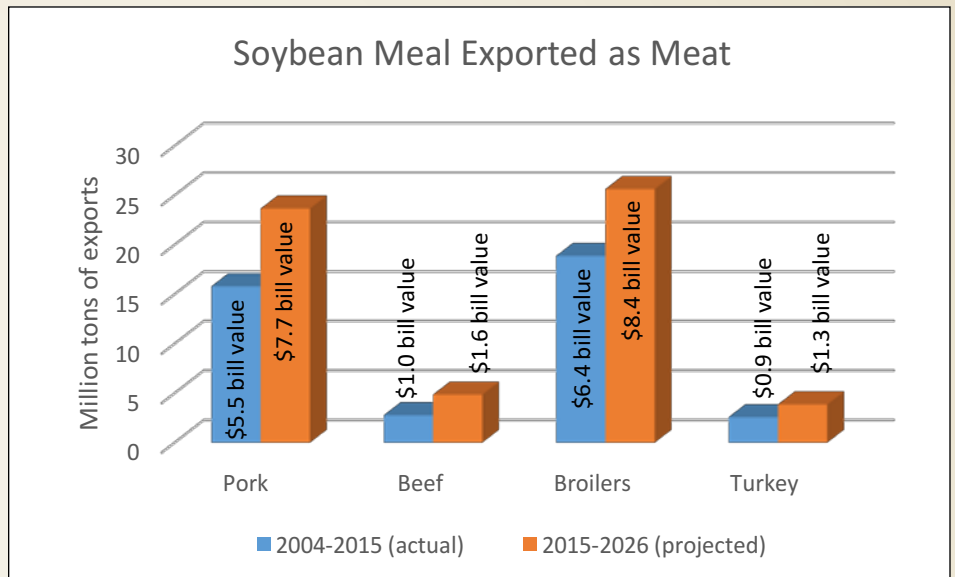
14% of turkey

Or .366 million MT, ranking as the top turkey exporter in the world

MT (Metric Ton) = ~ 2,204 lbs

Growth for all Sectors ▶

Over the past 11 years 40.1 million tons of soybean meal worth \$13.8 billion to the U.S. soybean industry were exported as meat and poultry and results indicate in the next 12 years, it can be expected that 58.1 million tons of soybean meal worth \$18.9 billion to the industry will be exported as meat and poultry.

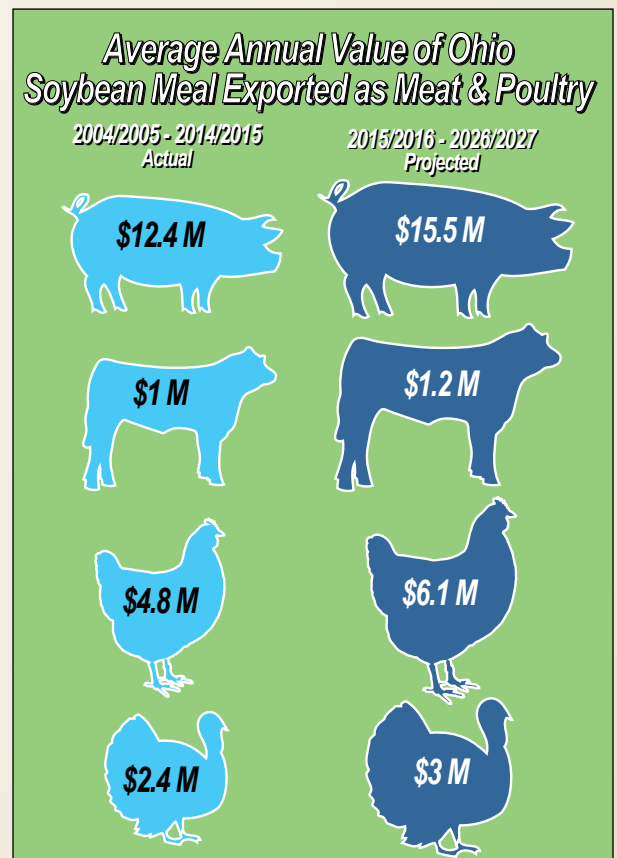


◀ If the Trend Continues

In the past 11 years, the annual average value of soybean meal from meat and poultry exports was estimated at \$1.253 billion. In the next 12 years, the annual average is expected to grow to around \$1.576 billion.

The Impact for Ohio Farmers ▶

With the amount of soybean meal, and in turn soybeans, that are consumed in the production of meat and poultry, it is clear the continued expansion and promotion of these exports is important to the continued success of Ohio soybean farmers. It is valid to assume global meat and poultry consumption will continue to increase through the next 12 years with poultry consumption increasing slightly faster due to its low price worldwide.



Shifting Markets Maintain Increased Demand




From 2004/2005 to 2014/2015 U.S. meat and poultry exports had substantial growth. At the same time, key export markets changed considerably with Mexico, Japan, Canada, South Korea, and China becoming important export destinations.

Long-term projections assume that current sanitary restrictions and trade

agreements will remain in place and new growth will come from growing markets and expanding trade through the implementation of the Trans-Pacific Partnership (TPP). When the TPP is implemented, tariffs in key markets — such as pork demand in Japan — will benefit from gradual reduction in tariffs making U.S. imports more competitive.

Worldwide, poultry meat consumption is expected to increase the fastest at 2.2 percent annually with pork and beef consumption growing by 1.2 percent and 1.3 percent respectively. Developing countries carry 81 percent of the projected increase with their growing middle class and limited expansion for their own production.

Key Markets for U.S. Meat and Poultry Export Growth Through 2024

-  **Pork**
 - Mexico
 - Pacific Rim
-  **Beef**
 - Japan & South Korea
 - Middle East & Africa
-  **Poultry**
 - Mexico
 - Middle East & Africa





USDA's 10 year projection for U.S. meat and poultry exports assumes no shocks or disruptions to the supply and demand. Any changes in weather patterns, political policy or trade agreements could have an impact on the long term projections. To acknowledge the possibilities, USB also assessed five alternative scenarios to the baseline projections.

► **Alternative Scenario 1:
Disruption of Poultry Trade to
China and South Korea**

In the spring of 2015, China and South Korea banned poultry from the U.S. due to high pathogenic avian influenza detection and re-gaining the market share is proving to be tough. This scenario assumes the U.S. would lose all market share with China and South Korea for broilers and turkey trade. Such a situation would shift the export demand downward and result in a negative shift on the long term projections trend line. It is estimated the change in export demand would drop soybean meal exported as meat and poultry by five percent over the projected period.

► **Alternative Scenario 2:
Three-Year Global Recession
2018–2020**

This scenario looks at a temporary three-year slowdown in global GDP growth from 2018–2020 where it would be expected that overall meat and poultry exports from the U.S. will decrease, but will start to improve at a later date. Demand for meat products would also be expected to shift as income changes. Overall, results suggest total soybean

meal exported as meat and poultry would fall below long-term projections by an average of eight percent.

► **Alternative Scenario 3:
Exchange Rate Volatility and US
Dollar Appreciation**

The influence of exchange rates on agricultural trade is well established and impacts tend to be commodity specific. It is hypothesized that an increase in the value of the U.S. dollar would make U.S. exports more expensive and reduce meat and poultry demand abroad. Exchange rates between the U.S. dollar and Japanese yen was used to evaluate this scenario. Shifts in the exchange rate would change the relative price of exported goods as well as the volumes traded ultimately impacting the amount of soybean meal exported as meat and poultry. Results suggest, on average, a 15 percent reduction in the projections for soybean meal exported as meat and poultry with the pork sector taking the biggest hit.

► **Alternative Scenario 4:
Import Tariff Rates Increase in a
Major Importer Country: Mexico**

Tariffs from Mexico, threatened over the U.S.'s country of origin labelling

(COOL) rules for meat and poultry would have tremendous impact on U.S. meat and poultry exports. These tariffs would drastically increase the price of U.S. meat and poultry with an immediate drop that would impact growth over time. Total soybean meal exports as meat and poultry would drop by an average of 18 percent over the long-term projection period.

► **Alternative Scenario 5:
Export Growth Due to Trans-
Pacific Partnership**

Through the implementation of the Trans-Pacific Partnership, the U.S. hopes to boost American exports to some of the world's most robust economies including Japan. This scenario looks at Japanese government eliminating both tariff and non-tariff barriers on red meat exports that would result in a volume increase for U.S. exports. Assuming a 50 percent elimination of current tariff and non-tariff barriers there is a significant positive deviation from the baseline projection in meat exports to Japan. Relaxing restrictions could result in an average of 12 percent increase in soybean meal exported as meat and poultry with a majority of the gains realized in pork exports. ♦



Celebrating
50 Years



Celebrating
25 Years

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 long-term 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.



According to USDA data, nearly five billion pounds of soybean oil went into biodiesel production last year, or approximately 25 percent of the oil from the domestic soybean crush.

New Century Niches

Ohio Soybean Farmers Cater to State's Strengths

Ohio is home to innovators, both on the farm and in the city. In 2002, Ohio launched its Third Frontier program, an initiative within the Department of Development that was created to establish the state as an innovation leader. The program was set up to expand the state's high-tech research capabilities and accelerate the pace of commercialization within Ohio.

Similarly, farmer leaders for the Ohio Soybean Council (OSC) and Ohio Soybean Association (OSA) have carved innovative niches in the new century. Unique soy-based products and soybean varieties have provided new uses and new profitability streams for the state's farmers.

Banking on Biodiesel

Biodiesel was first developed in the mid-1990s. But it did not really blossom into a viable commercial soybean-oil-as-feedstock fuel until 2000, when it became the only alternative fuel to successfully complete the Environmental Protection Agency's (EPA) Tier I and Tier II Health

Effects Testing under the Clean Air Act. At the time, the U.S. biodiesel industry was producing about 500,000 gallons per year. Biodiesel got another boost when President Bush signed legislation establishing its tax incentive in 2005. Production rose to 500 million gallons per year.

"The federal tax incentive really helped drive biodiesel production and use," said Tom Fontana, director of research and education for OSC. "Ohio soybean farmers worked to make more biodiesel available through a distribution network in the state. By 2008, the Renewable Fuel Standard (RFS) came along, and OSA worked with the National Biodiesel Board (NBB) to promote its implementation to expand biodiesel use."

As biodiesel's strong environmental and performance profile became apparent to diesel users, Fontana says Ohio soybean farmers shared critical information through trade shows, petroleum distributors, school bus fleets and others. Ohio checkoff funds also supported NBB's Advanced Biofuels Initiative and a variety

of technical studies to validate biodiesel's capabilities. Biodiesel was named the only commercial-scale advanced biofuel in America, as defined by the EPA.

"At one time we had several biodiesel producers in the state, although they have come and gone as the tax credit availability changed," said Fontana. "Ohio has one biodiesel facility today owned by Marathon Oil near Cincinnati that has become a major producer with a 65-million-gallon production capacity."

Nationwide, more than 78 percent of U.S. manufacturers now support B20 or higher biodiesel blends in at least some of their equipment. In 2015, the industry set a new record with a 2.1 billion gallon Advanced Biofuel market, exceeding RFS volume requirements for the third year in a row. According to USDA data, nearly five billion pounds of soybean oil went into biodiesel production last year, or approximately 25 percent of the oil from the domestic soybean crush. That represents about 12 percent of U.S. soybean acres, and twice Ohio's expected production.

OSC Partners on Bio-Products Boon

For the last 20 years Ohio soybean farmers have placed a priority on developing other new uses as well, with a focus on industrial products. OSC has worked with Battelle in Columbus, Ohio, to create new products and patents. Together the partnership has yielded several new uses that have won R&D 100 Awards for top technologies.

"Since Battelle is next door, it was an easy partnership to begin. They recognize soybeans are a good feedstock, and we had forward-thinking farmers who were willing to take the risk and focus on new products that other state soybean groups did not want to touch," said Fontana.

Soy toner for computer print cartridges was one of the first successful products, noted Barry McGraw, director of product development and commercialization for OSC.

"The goal has been to commercialize promising products and push them into use," he said. "OSC receives royalties on some of them that we use to fund scholarships and research."

For example, soy-based plasticizers were developed to replace petroleum in such uses as vinyl siding, PVC pipes and hospital blood bags. The plasticizer technology was licensed to PolyOne Corporation and is still in use in the market today under the trade name Reflex. Likewise, soy polyol foams were created for use in furniture and car seats and licensed to Emery OleoChemicals in 2009. Soy powder coatings for appliances were licensed to Hexion, and a soy polymer for polypropylene applications was the fifth successful product added to the portfolio.

OSC continues its efforts to develop new products, with one change, said McGraw. OSC now sometimes files for its own patents and commercialization. Most recently, Enzomeal, an improved soybean meal for fish feed, was registered for patents, along with a BPA-free soy resin.

OSC also funds companies with a gap between research and commercialization to help get products to market.

"The rationale is that there is not just one single product that makes the difference for farmers. They all add up to use soybeans and help support soybean prices for our progressive farmers," said McGraw. "Farmers have come to expect to increase the demand for soybean products and receive a substantial return on investment (ROI) so they can re-invest in Ohio agriculture."

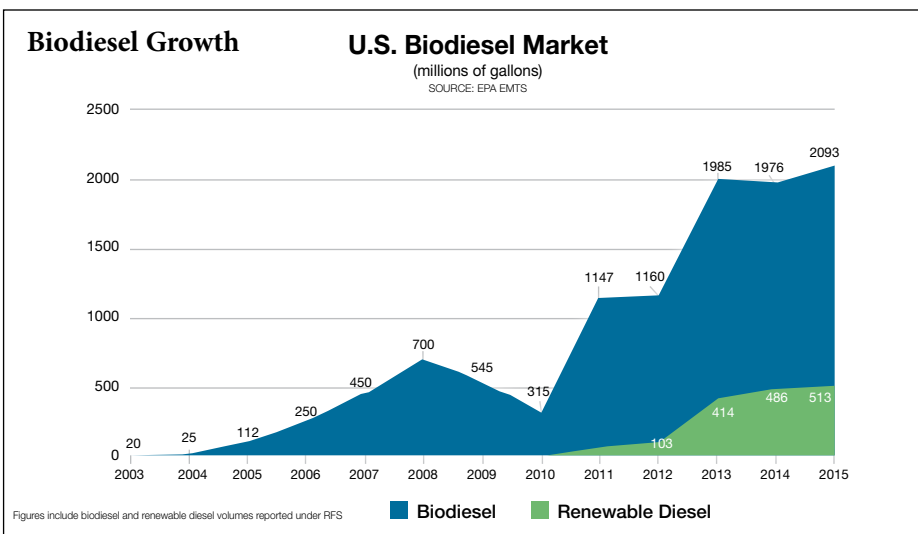
Ohio Finds Edible Oils Niche

As trans fats in foods came under pressure in the early 2000s, the soybean industry began searching for solutions. According to the United Soybean Board (USB), commodity soybean oil had always been recognized as not stable enough for applications needed by the frying and packaged goods industries. Processors relied on hydrogenation to make the oil stable.

Partial hydrogenation of soybean oil creates trans fats. And in 2006, the U.S. Food and Drug Administration (FDA) began to require trans fats to be labeled on food products. Food companies were forced to reformulate their products in order to avoid labeling. The U.S. soy industry saw its domestic share of the edible soy market fall by four billion pounds per year.

"The soy checkoff developed several initiatives with industry partners to look into the opportunity for a better soy oil. The better bean initiative began in the early 2000s, followed by QUALISOY for a third-party view of the U.S. soybean market," said Dale Profit, OSC board member, soybean farmer from Van Wert, Ohio, who also serves as USB farmer leader and QUALISOY board member.

"In 2015, the FDA issued a final rule to remove the GRAS (generally recognized as safe) status of partially hydrogenated oils and began phasing the oils out of the food supply," he continues. "Today, nearly two billion pounds of soybean oil are still being sold partially hydrogenated, but that demand will go away in the next few years as companies comply with the ruling." →





Investing Checkoff Dollars



John Motter from Jenera, Ohio, has grown high oleic soybeans since first introduced in the state in 2011. Today his soybean production is 100 percent high oleic.

The industry had identified a high oleic soybean in the early 2000s as the ideal soybean to meet customer needs for a better functioning oil. High oleic soybeans produce oil that does not require hydrogenation. High oleic soybean production began in Ohio in 2011, in what seed companies refer to as their “enterprise zones,” found mostly in Ohio and Indiana.

John Motter from Jenera, Ohio who also serves on OSC and USB’s Board of Directors, has grown high oleic soybeans since first introduced. In fact, representatives from Pioneer and Bunge met with 83 growers on Motter’s farm that year to talk about production. Twelve farmers grew 2,500 acres of high oleic soybeans in Ohio that year.

“I have grown them every year since. At first I wanted to see how yields compared, so I still grew some commercial varieties in 2012. When I confirmed their potential, I went all high oleic,” he said. “Now soybeans are regaining market share in edible oils, and this is the answer.”

Motter says seed companies have placed the trait in their good genetics, so there is not a yield drag. He also receives a premium for maintaining their identity preserved quality. While that stewardship premium will likely go away at some point, he anticipates he will still get a premium for helping keep the

supply line full and delivering to processors as needed.

“The soybean industry established a goal of having 18 million acres of high oleic soybeans planted by 2023 to increase demand for U.S. soy oil and increase the profitability for U.S. soybean farmers,” said Motter. “If we can achieve that goal, it would make high oleic soybeans the fourth largest row crop grown in the U.S., and food companies would have a higher performing, more stable cooking oil that is grown domestically.”

“Look at the geography in Ohio. There are four high oleic processors here, and soybeans and food products move west to east. About two-thirds of the U.S. population is within 500 miles of Ohio. We need to focus on the food market since two-thirds of our soybean oil is used in food production. We have a transportation disadvantage to transport soybeans to the Gulf for export. It makes sense for Ohio to stay on the food side.”

New Varieties Meet Value-Added Demand

High oleic soybean production has been a successful testing ground for Ohio, said Fontana, but other varieties also complement growing conditions and location.

“Many of the varieties grown in Ohio are food grade. With our soils and climate,

farmers do well to grow these high-protein varieties that have the right sugar profile for Asian markets to make tofu, soymilk and other products. These IP soybeans also earn a premium,” he says. “In fact, Ohio farmers grow about 10 percent non-GMO soybeans, which is a high percentage.”

Leah McHale, Ohio State University associate professor in horticulture and crop science, began working with OSC in 2009 as a soybean breeder. From 2010 to 2014, she helped release three new cultivars, and released an additional five cultivars in 2015.

“We target niche markets for cultivar development,” said McHale. “Food grade, high-protein, large seeded soybeans for tofu and soy milk production and now we are working on cultivars for natto and soy sprouts production. We have non-GMO high oleic cultivars in development and continue to work with Anne Dorrance, OSU researcher on cultivars with disease resistance.”

“We had a huge educational effort to increase awareness and management of Asian soybean rust with plant pathologist Anne Dorrance,” said John Lumpe, who served as OSA and OSC executive director from 2004 to 2009.

“Variety development and production management with the Ohio Agricultural Research and Development Center (OARDC) was a good partnership. We did a great job with the checkoff to raise awareness of Asian rust and diseases like phytophthora root rot. Job number one was to get more dollars back into farmer pockets, and I think we did a good job achieving that.” ♦

In the final installment of the Ohio soybean history articles, we will take a look ahead at current topics that include production sustainability, consumer and millennial concerns and questions, new technology and domestic and international market potential.



Soybean Farmers Well Represented at Ohio State Fair

A new display, a replica of a grain bin, included the stages of soybean growth, Ohio farm photos, soybean composition and doubled as a photo booth.



Bret Davis, OSC board member and soybean farmer from Delaware County hands out grocery bags to fairgoers at the 2016 Ohio State Fair.

photo booth. Visitors to the display were able to learn about the different stages of soybean growth, photos of Ohio farms and soybean composition among other facts while taking a memorable photo with friends.

At the booth, visitors had the chance to use virtual reality glasses to tour soybean fields and the Ohio River. It was a unique way to use technology to highlight soybean exports and international markets. Many examples of soy-based products were on display and a mechanical pig racing game showcased animal agriculture as the number



one customer of the soybean industry. Ohio soybeans were a major focus across the Fair on the second Saturday with Ohio Soybean Day. OSC provided free admission vouchers for Ohio Soybean farmers and discounted admission for their families. Additionally, board members and staff from OSC greeted visitors with a display at the Cardinal Gate entrance to hand out reusable grocery bags and engage fairgoers in conversation about a variety of topics including sustainability in agriculture, the many uses for soybeans and practices they use on their farms.

More than 921,000 fairgoers entered the gates at the 2016 Ohio State Fair and stepped into a land of food, rides, animals, entertainment and more. The goal of the Ohio Soybean Council (OSC) and soybean checkoff was to make sure the “more” included more knowledge of agriculture, more awareness of the soybean industry and more connections between consumers and farmers.

“The Ohio State Fair is a priority outreach event each year providing a vast audience where a majority of people have little or no connection to a working farm,” said Terry McClure, OSC chairman and soybean farmer from Paulding County.

New this year, the OSC display in the Nationwide Ag and Hort Building featured a replica of a grain bin that was both an educational display and a

photo booth. Visitors to the display were able to learn about the different stages of soybean growth, photos of Ohio farms and soybean composition among other facts while taking a memorable photo with friends.



OSC had a highly visible presence throughout the length of the fair as well by serving as a presenting sponsor of the Junior Livestock Shows, O’Neill Swine Building, Voinovich Livestock and Trade Center and Rabbit and Poultry Pavilion with signs, displays and informational takeaways at each building. ♦

Fairgoers had the opportunity to take a virtual reality tour down the Ohio River and over an Ohio soybean field by trying out the virtual reality glasses.



When is Natural Gas a Viable Option for Ohio Farmers?

Farmers are natural innovators, always seeking a better or more efficient way to manage their farms. Work on the farm never seems to have a stopping point; tasks simply change with the seasons. With more farmers investing in on-farm grain storage in recent years, this fall season finds many farmers analyzing energy costs and the effectiveness of their grain drying systems and other heating systems, such as temperature regulated confinement buildings. Converting farm operations to natural gas may be a logical next step to realizing efficiencies and savings.

The Ohio Soybean Council (OSC) and soybean checkoff recognizes that farmers are faced with both threats and opportunities in the critical infrastructure that facilitates their work on the farm. Recently, OSC conducted research and surveyed farmers to identify the most prevalent critical infrastructure issues and assistance farmers need to tackle them. Supported by OSC partner Energetics Incorporated, the findings were evaluated by issue prevalence, likelihood the impact of the threat or opportunity would be realized within three years, cost factors, and the overall magnitude of the issue. In the energy category, natural gas topped the list for both threats and opportunities, prompting OSC to take a closer look at the logistics and economics of farms accessing natural gas.

“We wanted to look at the efficiency of farmers adding natural gas as an energy source on their farms,” said Dave Dotterer,

chair of OSC’S demand committee and soybean farmer from Wayne County. “We understand there are multiple solutions and they’re not going to make



sense for every operation. We looked at potential conversion options and what a farmer would need to know to make a determination of cost and return on investment for their particular situation.”

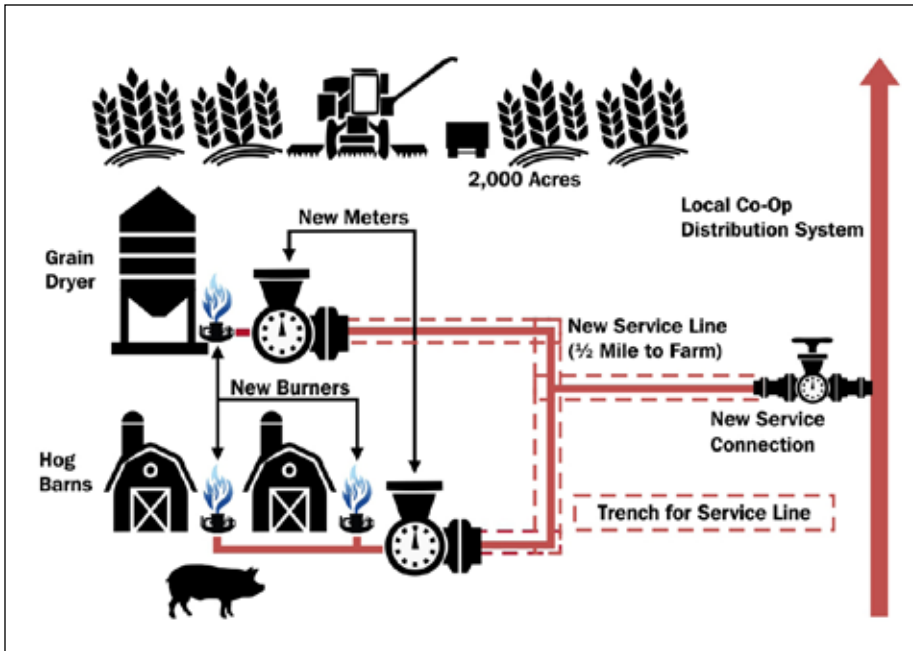
Economic Viability of Natural Gas

A key starting point is to determine the economic viability of natural gas conversion by assessing the farm’s current

propane usage and the associated fuel cost comparison with natural gas. Since propane is typically sold by the gallon and natural gas is typically sold by 100 cubic feet (ccf), the energy content — measured in British thermal units (BTU) — becomes the commonality. In May of 2016, propane prices were \$1.33/gal (equivalent to \$14.54/ million BTU) while natural gas prices were \$0.78/ccf (equivalent to \$7.50/ million BTU). If a farm used 20,000 gallons of propane per year at a cost of \$26,600, the energy equivalent cost of natural gas would be \$13,725 with a potential savings of \$12,875 per year.

Once the savings potential is established for a farm, the next step is to determine the actual cost of conversion and how long it may take to realize a return on that investment. OSC has made available an Excel spreadsheet for farmers to input numbers such as distance to the pipeline, energy usage, propane cost, and conversion costs. The spreadsheet automatically calculates annual costs, annual savings, and the estimated payoff period (in years). Additional documents available to farmers include a fact sheet on the conversion process and a list of organizations integral to the conversion process, including the

local utility, a local co-op or government aggregator group, transmission companies, supply negotiators, state and national trade associations or non-profits, and equipment manufacturers. The information is being distributed to OSU Extension and disseminated through their agents across the state as part of their Energize Ohio program for renewable energy.



Case Study Farm: The case study looked at cost and return on investment for a farm with 2,000 crop acres which could utilize natural gas for a grain dryer as well as two hog buildings by connecting to a local co-op's service line just half a mile from the farm.

Overall, the conversion project cost for the case study farmer would be approximately \$36,000 with estimated fuel savings of \$25,000 per year, with approximately just one and one half years before the farmer would realize the return on his investment. Obviously, the further a farm is from a utility or co-op natural gas line would increase the cost, while the more natural gas a farm uses would accelerate the return on investment.

For more information on the natural gas conversion process, or to download copies of the fact sheet and conversion worksheet, please visit www.soyohio.org/council/investment/transportation-logistics/ ♦

“We quickly discovered most farmers already know the layout of the pipelines and where they run, but we found that even those within half a mile have a hard time making connections with the right people to find out how to make it happen,” added Terry McClure, OSC Board Chairman.” To simplify the process for them, we’ve put together worksheets with calculations, information and contacts farmers would need to make the conversion.”

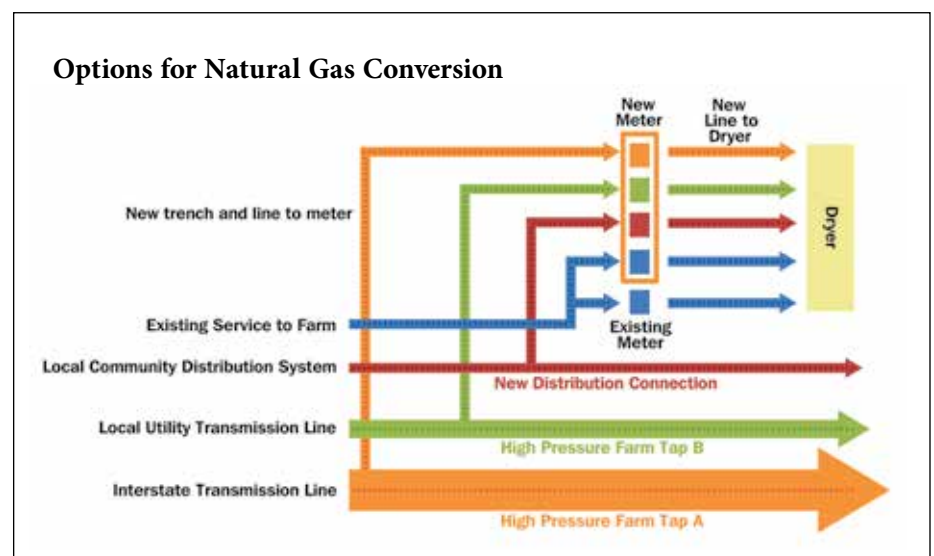
Is Natural Gas Conversion Right for Your Farm?

To give farmers an idea of what to expect from the conversion process and return on investment, OSC commissioned a case study based on a 2,000-acre crop farm in Ohio with two hog barns located one half mile from a natural gas line (owned by a local co-op) and that uses 40,000 gallons of propane per year. The farmer is interested in converting a grain dryer and barn heating to natural gas and talks to the local co-op about installing a new service line. The co-op stands to benefit from expanding their customer base and the farmer stands to save money by using natural gas instead of propane.

The farmer would pay for the parts, labor, and permits to install the service

line and two meters from the co-op as well as new natural gas lines and burners for the dryer and barns. They may be eligible for a USDA grant and there is the possibility of selling the service line back to the co-op to eliminate maintenance costs. Challenges would include finding licensed contractors to complete the service installation and conversion of the heaters and dryers on the farm along with tracking the numerous points of contact and various services needed to complete the conversion.

NG Conversion Options: Sample calculations are available for each conversion option, whether simply tapping into existing service or making the connection to a high pressure tap with cost and payback time varying between the options.





Engineering a Future in Agriculture



Nate Hager

As Nate Hager neared the end of his senior year in high school he had decided his future would involve agriculture and The Ohio State University, but beyond that

things were hazy. After visiting with some faculty and staff at the College of Food, Agricultural and Environmental Science and discussing his interest in ethanol and herbicide resistance he settled on a major in chemical and biomolecular engineering with a focus in agriculture.

Last year Nate connected with the Ohio Soybean Council (OSC) through a scholarship award and recently finished up a summer internship under the direction of OSC's Director of Product Development and Commercialization, Barry McGraw.

"We feel it is important to engage bright young people, like Nate, to help them connect engineering principals with the scientific aspects of agriculture and get them excited about the opportunities with the soybean industry," said McGraw. "There is a strong need for young people to become agricultural scientists, engineers and researchers to make sure the soybean industry continues to grow and thrive for farmers to remain successful."

A majority of Nate's role included assisting with the economic analysis and commercialization efforts of OSC's Soy-PK can coating, Enzomeal — an improved soybean meal for fish feed, and soy methyl ester stain technologies. His work over the summer involved economic studies of the products including research of raw material costs to determine the competitiveness of product cost with other non-soy competing products.

A big project for Nate was creating a website for Enzomeal to enhance the sharing of research and information with potential

partners for commercialization. Part of his time was also spent working with Energetics consultants and Ohio State Extension Agents on the Natural Gas Outreach Program to bring farmers efficient energy options.

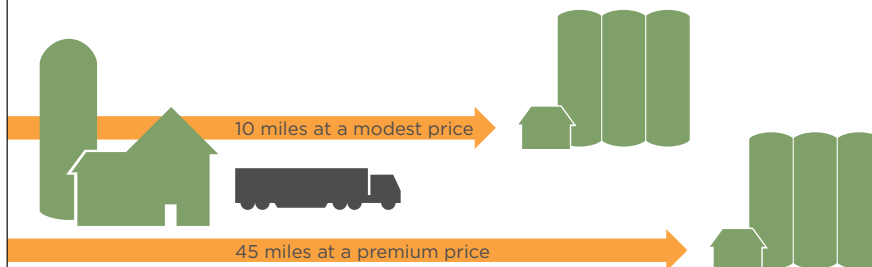
"Barry is a great mentor, he put a lot of time into me and I learned a lot about product development and commercialization. It was also beneficial to meet folks from the national and global network of leaders and innovators OSC is connected with," said Hager. "I think if more people in my class realized how the processes and principles we learn in class can be applied in agriculture they would consider that path. Agriculture is a field where there is still a lot of research to be done and there's the opportunity to be innovative."

Growing up his family's farm in Wapakoneta may have sparked his interest in agriculture, but Nate admits his time at OSC solidified his desire to work in agriculture. Nate is on track to graduate from OSU in the fall of 2017. ♦

TRANSPORTATION CALCULATOR

Where should I deliver my soybeans or grain?

Should I deliver my soybeans or grain to the local elevator offering a more modest price or the more distant market offering a premium price?



Farmers must not only be mindful of the price received, but also the costs associated with the delivery. After all, the goal is to maximize profit vs. maximize revenue.

The calculator works for soybeans, corn, wheat and other commodities. In a few short steps, farmers can determine not only how much money will be received but also how much will be spent.

Search for **"Soy Transportation Coalition"** or **"STC Calculator"** on the App Store or Google Play. The calculator can also be accessed online at www.soytransportation.org/calculator.

Established in 2007, the Soy Transportation Coalition is an organization comprised of the Ohio Soybean Council, twelve other state soybean boards, the American Soybean Association, and the United Soybean Board.

Funded by the soybean checkoff.



The Flip Side of Farming, What's in the Soil

When harvest winds down and the crops are in from the fields, farmers can take a break from worrying about what's growing up from the soil and take a moment to think about what's happening underneath the surface. Soil sampling is an important tool to evaluate soil health and investigate the nutrient levels available for the next year's crop.

"Most farmers today understand basic soil sample results, but they might not be aware of nutrient interaction or movement within the soil. There's a lot of no-till acres today where the soil really isn't disturbed much at all and when fertilizer is broadcasted across the soil surface, over time, we get a buildup or stratification of nutrients," said Bill Urbanowicz, an agronomist at Spectrum Analytic in Washington Courthouse, Ohio.

An easy way to see this is when looking at soil pH in a field where the pH is being corrected. If a heavy lime application was applied and there is no soil movement it is likely there will be a higher pH near the top of the soil, but no change in the pH deeper down. Nutrients such as lime and phosphorous will only move a quarter of an inch in a year without soil disturbance taking several years to work through the soil profile.

To get accurate readings, whether the focus is pH or other soil properties and nutrients, it is imperative to take accurate samples.

"When we look at a field we only see two dimensional, we don't see the depth below the ground and what's going on. Seven inches is the recommended depth and if you're not careful it's easy to get to eight inches or in a dry year with hard soils it may be difficult to get past three or four inches. Taking samples at varying depths above or below seven inches will dramatically affect your readings," said Urbanowicz.

When soil sampling is done right it can reveal many factors of soil health

and allow the landowner or grower to make adjustments and apply nutrients if necessary, not only for the crop, but to maintain or improve soil properties as well.

"We have guys that look at the physical properties of the soil, and when they get samples from northwest Ohio with heavy lake bed clays if the magnesium levels creep too high, their soils get real tight and there is poor water infiltration; it can cause ponding. Once they know, they can apply gypsum or lime to increase the calcium and open the soil back up," said Luke Baker, Ph.D. — an agronomist and lab specialist at Brookside Laboratories in New Bremen, Ohio.

Another item Baker has seen farmers looking at more is sulfur. With parts of the state seeing high yielding crops consistently in the last few years, more sulfur is being pulled out of the soil. Sulfur is commonly found in acid rain and with the Clean Air Act, sulfur has been removed from emissions thus many farmers may be seeing some sulfur deficiencies in their crops.

"Manganese is another one, I saw a lot of flashing this summer after glyphosate (Roundup®) was applied which is a sign of

manganese deficiency," said Baker. "That's why we do a complete test. Our guys are looking at fertility from every point of view; they're not just looking at pH, phosphorous and potassium. The lowest rung on the barrel is the limiting factor, last year it was drainage, this year it was drought, but another year it could be zinc, magnesium, or any number of nutrients."

Being near Grand Lake Saint Mary's phosphorous is a big concern with recent water quality issues. Farmers are paying more attention to those levels to keep them as low as they possibly can. Some have levels over 150 parts per million which is much higher than necessary for any crop.

"Once you get above those levels you're increasing potential for loss of soluble phosphorous getting into the water," said Baker. "There are good things being worked on such as phosphorous removal equipment to run waste water through and remove the phosphorous to concentrate it as a fertilizer. That's going to become a bigger and bigger topic moving forward as awareness spreads. We've got to continue to be diligent and proactive with our nutrient management planning and solutions." ♦





TECH TALK: Training and Learning in a Digital Age

For decades, Ohio farmers have depended on sources like radio and TV to provide them with information on commodity markets. If they found an unknown pest or disease in their field, they might have to drive to their local agronomist to find out what it is and how to treat it. If they had questions regarding calibrating or adjusting equipment they would have to wait for a service technician to come out to their farm, losing hours in productivity. And, if they wanted to train their workforce, it would typically be in either a classroom setting, a workshop or a sponsored field day.

In an industry beset by high input costs, lower commodity prices,

decreasing margins and continual environmental uncertainty, a growing number of U.S. farmers are using the internet, smartphones and other mobile devices to improve their knowledge, increase efficiency, organize information and learn new skills. The use of smart phones, social media tools (such as Twitter and Facebook), apps and other technologies are quickly becoming a critical source of information, training and education for tech-savvy growers.

Today, information is available everywhere and on-demand, meaning users can access the information when they need, when they want it, from just about anywhere. Commodity prices can be checked multiple times a day

and farmers can even lock in sale prices from the comfort of their tractor.

If they want to learn more about a product, a new technology or an agricultural practice, they don't have to attend a workshop, event or class. They can learn almost everything online.

Online learning offers advantages to all learners, but in agricultural and rural development areas, where learners are often based in geographically remote areas, it provides many benefits, including:

- ▶ Reduced travel time and costs
- ▶ Ability to choose the course or topic which best suits their interests
- ▶ Self-paced learning
- ▶ Learning can be scheduled around work and family needs

Online Degrees and Programs

For farmers looking for a formal education, online courses and degrees are quickly becoming a viable option. Because these courses are designed for working adults, they offer flexibility, the ability to attend classes from the privacy of their own homes and the opportunity to learn at times that are convenient for them. Online programs provide growers with the option of enrolling in classes at universities that are hundreds of miles away. General business programs have been available from hundreds of universities for years. Recently, however, more and more institutions are beginning to offer both undergraduate and graduate degree programs in Agricultural Sciences, Agricultural Business, Soil Science and Horticulture. The chart at right lists several of the universities currently offering online degrees and courses.

College/University	Institution Type	Location
Colorado State University	4-Year, Public	Fort Collins, CO
Oregon State University	4-Year, Public	Corvallis, OR
Kansas State University	4-Year, Public	Manhattan, KS
University of Northwestern Ohio	4-Year, Public	Lima, OH
Oklahoma State University	4-Year, Public	Stillwater, OK
Iowa State University	4-Year, Public	Ames, IA
University of Nebraska	4-Year, Public	Lincoln, NE
University of Missouri	4-Year, Public	Columbia, MO
University of Illinois	4-Year, Public	Urbana, IL

An increasing number of universities have started to offer online agriculture degrees and courses.

YouTube Learning through Video

Manufacturers, associations and universities are creating custom YouTube channels to deliver training and new information to growers.

If farmers prefer to learn new information via video, YouTube.com can provide them with thousands of online options. In a matter of minutes, users can research topics ranging from fungicide applications in soybeans to calibrating a specific yield monitor to learning how to interpret data from a variety of precision ag sources. Shrewd buyers can research hundreds of potential new equipment and input choices

before talking to a single sales representative. Almost every major ag equipment, input manufacturer and technology company has at least one YouTube channel.

Topics on these channels range from product overviews, customer reviews and training on proper usage or application. In addition, these channels often provide agronomic, operational and financial training as additional educational

services for growers and producers.

Many associations, such as the United Soybean Board (USB), also have robust channel offerings designed to educate growers on a variety of production topics. The USB channel has over 130 videos, including topics such as cover crops, protecting yield, pest management, seed selection, biodiesel, legislative updates as well as a variety of other topics.

E-learning Modules

A variety of organizations and institutions also offer free or low-cost e-learning courses for those working in agriculture. Typically, this content is delivered in engaging modules that range from 10-45 minutes in length. Often, these courses are delivered either free

of charge or at a low cost. For example, **RightRisk.org** offers 13 different courses for farmers and producers. Course titles include Insuring Success (Selecting the Right Crop Insurance), Livestock Risk Protection, Risk Management, Effective Recording Keeping, Succession Planning

and Financial Analysis. University Extension Services, such as The University of Florida IFAS, offer many e-learning programs designed specifically for farmers. Some of their titles include Irrigation Components, Soil Sampling and Testing, and Pesticide Management.

Using Apps to Learn and Solve Problems

Perhaps the greatest growth in technology-based learning and training comes in the field of mobile apps. A mobile app is defined as a computer program designed to run on mobile devices such as smartphones and tablet computers. These computer programs can be used to access real-time data, organize information, solve problems, and learn new skills. The use of apps across all industries and lifestyles has increased exponentially in recent years. In 2010, according to Statista, Inc., there were 300,000 apps available in Apple's App Store. In 2015, that number increased to over 1.5 million apps — a 400% increase in five years. Nowhere has this growth been more evident than in agriculture. Hundreds of ag-focused apps can now be downloaded for iPhones, Androids and iPads. Below are a couple of examples of the types of apps that are currently being used to train and educate the agricultural workforce.

► **Extreme Beans** — produced by the United Soybean Board (USB), this app allows users to learn from current

university research, calculate seeding rates, conduct a breakeven analysis, etc. It also provides the latest USB news and the latest social media feeds.

► **ID Weeds** — developed by the University of Minnesota Extension. Growers can learn about weed species that may grow on their farms. The tool assists them in identifying weed types by answering a series of questions. Second, if a farmer knows the name of the weed, he/she can search for images and information about the weeds.

► **My New Holland** — Just one of the many equipment manufacturer apps out there, the My New Holland app allows users access to informational videos, operating tips, maintenance suggestions and safety training from New Holland product experts.

Mobile apps for agriculture can provide growers with real-time commodity prices, present current and future weather conditions, research equipment purchases, listen to lectures from ag industry experts and get advice about improving their farming operations.

Web apps are another source of valuable information for growers.



A good source to review these applications is **www.AgWebAppFinder.com**. It provides an overview and rating for current and upcoming ag apps in the marketplace.

To keep pace in today's rapidly changing world, access to information in real-time is critical. Successful growers must be life-long learners and constantly on the prowl for new information. Digital learning and new technologies such as online degrees and courseware, YouTube channels, e-learning modules and mobile apps are just a few of the options available to growers. ♦

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