

THE NORTH DAKOTA **Soybean** GROWER MAGAZINE

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INSIDE:
Laying the
Foundation
for Policy

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HELPING YOU DELIVER ON DEMAND

Whether it's improving soybean meal to outperform the competition or promoting the sustainability of U.S. soy, the soy checkoff has been working behind the scenes to help farmers satisfy their customers' needs. We're looking inside the bean, beyond the bushel and around the world to keep preference for U.S. soy strong. And for U.S. soybean farmers like you, the impact is invaluable.

See more ways the soy checkoff is maximizing profit opportunities for farmers at unitedsoybean.org



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On the cover

After a very challenging winter, the image of planters rolling across the North Dakota landscape is a welcome sight. The opportunities for North Dakota soybeans and soybean products is growing right along with the newly planted seeds. Read all about those opportunities in this issue of *The North Dakota Soybean Grower Magazine*.

—Photo by Wanbaugh Studios



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Sine Die

The 68th legislative session ended April 30 at about 3 a.m. People who work the legislative session are always exhausted at the end, with most legislators, lobbyists and agency folks tired of the grind and of each other. It all gets back to normal, after a week or two apart from each other, but the break is as welcomed as you might imagine. In this article, I will attempt to summarize, in no particular order, most bills in major categories that are important to your industry. I have included many bill numbers in case you would like to research them in greater detail.

There are some changes to the animal agriculture laws about which you have probably heard. One was HB 1371, which was called a number of things, such as the Freedom to Farm Act, but everybody pretty much called it the corporate farming bill. The initial bill had some resistance, and a version was worked out that looks like it will function well. It provides some limitations for the corporate ownership of land as well as a percentage of corporate control that keeps family farmers in the driver's seat.

SB 2373 was titled the Livestock Friendly Initiative, setting up counties with the opportunity to display their willingness to host animal feeding operations. HB 1437 allowed willing counties and townships to analyze prospective sites for such activities; this program will be administered through the Department of Agriculture. That bill also gave political subdivisions help with getting their zoning up to snuff. HB 1423 provided, among other things, a model zoning task force that will look at how to update those issues. That task force is at work, visiting some animal ag-related facilities in North Dakota and neighboring states, as you read this magazine. There is an expectation that this suite of bills will be complementary and synergistic going forward.

Water issues are always watched by this organization, and there was plenty happening. Rural water received \$52 million, helping our farming communities with delivery and updating infrastructure that dates from the 1960s and 1970s. We saw some action on HB 1391, which specifies that the unofficial minutes of a water resource district (WRD) be published in the official newspaper within 10 days of the meeting. The bill also required that, if the

WRD has a website, those same minutes must be posted there as well. One million dollars was the threshold in the Century Code for which a water conveyance or flood-control project must conduct an economic analysis (EA) study. When it came to some legislators' attention that EA was being requested for projects well below that threshold, SB 2326 was offered. In committee, the threshold was amended to \$500,000, and while similar language was also part of the water budget bill (SB 2020), the conference committee for SB 2326 did settle on \$500,000. After being introduced by the interim Water Drainage Committee, SB 2036 was passed. It combined two codes that conflicted regarding drainage and retention. SB 2037 presented difficulties for WRDs and was defeated. We have a few joint water resource boards in our state, and SB 2372 was a largely successful effort to encourage more of that drainage basin type attitude. SB 2372 mandated that WRDs in the Red River, Souris, Devils Lake and Missouri Basins manage disputes between counties at the joint board level. HB 1239 reinstated a bill that had expired, allowing drain tiling on pieces under 80 acres to notify but not need a permit, in most cases.

Checkoff groups saw a substantive change in SB 2259 which sets their audits at \$4,000 for most groups and \$6,000 for the North Dakota Soybean Council, given the size of its budget. The bill also allows for an opt-out if a group would like a private audit. The state auditor retains some oversight or approval.

SB 2183 was the snow emergency bill that gave relief to political subdivisions for the unusual amount of snow we received this past winter and will be well used. In fact, as the process neared the end, another \$5 million were added to that pot because the snow did not quit until the session was nearly complete. Of course, you remember that snow.

We lost with our attempt to get a sales tax exemption for grain bins which, in theory, would have incentivized producers to increase storage so that soybeans could be supplied to the new crush plants year-round. That endeavor was HB 1370 which got Do Pass recommendations from both the Senate and House Tax Committees but got sunk in Senate Appropriations, partially because some people saw the benefits of



Veteran lawmaker and educator Phil Murphy is the NDSGA liaison between legislators and farmers.

higher prices for beans in that scenario negating the need for more tax breaks.

There were several attempts to secure funding for transportation issues, especially for county and township roads and bridges, but it was a battle all the way, with several bills being "rolled" into other budgets and bills. For townships, there was \$10 million based on mileage for miles maintained; another \$10 million from money left from the last session that was not able to be matched; and \$15 million in flex funding that gives them the chance, for the first time that I am aware of, whereby they can use the money for cities, counties, and townships outside their interstate and state highway systems. With the fund currently sitting at \$115 million, this change could be a big deal. North Dakota Department of Transportation (NDDOT) Director Ron Henke stated that, often when political subdivisions have needed help, the NDDOT has sympathized with the organizations, but the agency's hands were tied. Another policy change for the NDDOT budget was that half of the Motor Vehicle Excise Tax, money that, for years, had been put into the General Fund, is now being directed to the NDDOT where it had traditionally (and rightfully, many think) had been deposited. This change, along with flex funding, can provide a more reliable flow of money into political subdivisions.

The Ag Diversification and Development

—Story continued on page 17

Connecting Beyond Lawmakers

As an advocacy organization, we talk a lot about the importance of farmer engagement with lawmakers in Bismarck and in Washington, D.C. The North Dakota Soybean Growers Association (NDSGA) is active on both the state and national levels. Farmer-leaders, members and NDSGA staff monitor activities, offer testimony and provide input to the decision makers who are charged with creating policies that can affect our operations.

Once policies are put in place, they are administered by agencies that are charged with their implementation and administration. The NDSGA pays close attention to how the programs being implemented by state and federal agencies will affect North Dakota farmers.

One agency that oversees a wide range of policies that influence farmers is the Environmental Protection Agency (EPA). From Waters of the U.S. (WOTUS) to setting volume obligations for renewable fuels based on the Renewable Fuel Standard and overseeing the use of crop protection products such as seed treatments and herbicides, decisions made by the EPA matter to North Dakota farmers.

Earlier this year, several NDSGA board members gave testimony to the EPA about its proposed volume obligations for biodiesel. The NDSGA also provides comments and recommendations to the EPA as the agency considers how regulations under its oversight should be administered.

We applaud our friends at the North Dakota Grain Growers Association for their annual E-Tour, which brings EPA administrators from Washington and from regional offices to North Dakota. The NDSGA is supportive of this effort because it brings people who are charged with implementing and administering EPA programs into the countryside to meet with farmers and to hear from growers. Receiving feedback directly from the constituents who are affected by decisions can be a powerful thing.

In addition to the EPA, the NDSGA communicates with other important agencies, including various branches of the U.S. Department of Agriculture, the Department of Transportation, the Department of Energy and others.

We know that it's vital to connect with the lawmakers who are putting policy together, but



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it's also important that we, as an organization, have a voice with the people who put those policies into action.



Membership Application

To join ASA and the North Dakota Soybean Growers Association, complete and return this application with payment.

Name: _____

Spouse: _____

Date of Birth: _____

Farm/Company Name: _____

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City, State, Zip: _____

County: _____

Phone: _____

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Occupation (Please check all that apply)

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Do you raise: ☐ Cattle ☐ Hogs ☐ Poultry ☐ Dairy

Do you currently grow soybeans? ☐ Yes ☐ No

Soybean Acres: _____ Total Acres Farmed: _____

How did you hear about NDSGA? (Please circle one)

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A Voice for North Dakota Agriculture



Mike Brandenburg's farming roots run deep in LaMoure County. His family has been farming in the Edgeley area since his great-grandfather homesteaded there in 1902.

Today, he has sons, siblings and nephews who all farm in the area.

"Yeah, look in the Edgeley phone book, and there are a lot of Brandenburgs," Brandenburg says.

Brandenburg's name is also recognized at the state capitol. Rep. Mike Brandenburg has been in the state legislature for more than 20 years. He's one of the few active farmers serving in Bismarck.

Before his name was recognized at the state capitol, it was in Rep. Brandenburg's other public service where the seeds of legislative leadership were first planted.

"I served for 22 years in the North Dakota National Guard as a combat engineer. When I first got into the Guard, I'm one of those guys who has an opinion, and I can still remember our

platoon sergeant telling me, 'Brandenburg, you're going to be an instructor,'" Brandenburg recalls. "I said, 'Instructor, what do you mean, instructor?' But, there I was teaching classes. I was pretty fluid on my feet and able to speak, and that kind of transpired into involvement in other organizations."

Rep. Brandenburg has been involved as a township supervisor as well as with the LaMoure County Farm Bureau, the Farmers Union, and the local Lions Club. He still serves as the chairman of his local church board.

"I was asked to get involved in politics," Rep. Brandenburg declares, "and that's where I am, still involved in politics, representing my district and trying to do the best job that I can."

Rural Voice

Brandenburg first served as a state representative from 1997 through 2002. He returned in 2005 and has been serving consecutively since then.

"There aren't that many people in the legislature who are in agriculture, and whenever we talk about agriculture issues, they're

looking for me to stand up and talk about it, whether it's dealing with ethanol or soybean plants or township funding or anything that's connected to agriculture," Brandenburg asserts. "When people think of me, I think they think about me being in agriculture, and that makes me feel good."

Rep. Brandenburg serves as the vice chair of the Appropriations - Government Operations Division, which carries the agriculture commissioner's budget as well as funding for the North Dakota State University Research Extension Centers and ag research across the state. Those important resources have an influence on North Dakota agriculture. He also sits on the Interim Budget Committee as well as the Federal Environmental Law Impact Review Committee.

"I'm also very much involved with the wind energy in my district, so I've worked on a lot of that legislation over the past years, and I know I've made a difference with that," Rep. Brandenburg explains. "I support all forms of energy, whether it's coal or oil



Because Rep. Brandenburg's wife Lovice is by his side, there is much that gets done in both the legislature and at home on the farm.

or wind or natural gas as well as ethanol and biodiesel. It's about all the above and making them work. They all have a place in the in the world that we live in. So that's something that I'm very much involved with because, when you got agriculture and energy working together, you can really get a lot of things done. And that's the key to this state is, if we work together, we can accomplish a lot."

Rep. Brandenburg says that, among the key issues he's working on this session, are funding for township and county roads as well as support for the short line railroads that help move grain in rural communities. Work is also being done on finding a suitable location for a fertilizer plant.

As one of the few farmers in the legislature, Rep. Brandenburg has, at times, had to come to the defense of the state's agriculture industry, which is something that he's more than willing to do.

"I've had to stand up on the floor and tell people because, every once in a while, they get kind of smart and say agriculture is not that important, and I get to remind them that agriculture is still the number one industry in this state, and ag carries a big stick. When I do that, I holler in the



For more than two decades, Rep. Mike Brandenburg has balanced the work of farming with the responsibility of serving in the North Dakota legislature.

mic, and they really like that when I holler like that," Rep. Brandenburg states with a chuckle.

Staying Balanced

Balancing farm life and legislative work can be a challenge at times, especially when the session stretches close to the start of planting season. However, Rep.

Brandenburg describes how his sons have taken on much of the farm responsibilities and how his wife, Lovice, supports his endeavors and even enjoys being part of the political process. For those and other reasons, Rep. Brandenburg intends to keep being both a farmer and a legislator.

"I don't know why I like politics, but I do. What I do like about it is that I know I've made a difference, and that makes me feel like I want to do it some more," Rep. Brandenburg contends. "Someday, somebody brighter and shinier is going to come along and take over, and that's fine. But at this point, I think the people are happy with how I represent them and what I'm doing, and that's why I'm still here. I'll just keep doing that and trying to do the best job that I can."

While the harvests may be different, both politics and farming have their rewards.

"When the sun, the moon and the stars come together and you go home after the session is over, you can think about the good things that you did for the people you represent," Rep. Brandenburg says, "and then you get back home, and my sons say, 'Let's go to work. Get in the tractor.'"



Without the support of his family and workers on the farm, Rep. Brandenburg would not be able to accomplish what needs to be done during the legislative session in Bismarck. Left to right: Derek Brandenburg, Micah Brandenburg, Rep. Mike Brandenburg, Carson Brandenburg, Cameron Edwards, Marcus Brandenburg, DJ Badenhorst, JC Vanwyk and Pat Aberle.

—Story by Dan Lemke, photos by staff and The Creative Treatment

Accept the Challenge to be Better than Average

Checkoff
Investment



Are you ready to accept the challenge to be a better-than-average soybean farmer? That question was posed during a winter soybean meeting that I attended. The speaker explained how farmers who can improve their productivity by at least 5%, on average, are producers who will succeed.

While there may be many ways to improve our production plan, one of the first ideas that came to my mind is something the North Dakota Soybean Council already supports: the Soybean Research & Information Network (SRIN).

Research is one of the primary buckets funded through state and national soybean checkoff dollars. As a checkoff organization representative, I often get asked how our checkoff money is spent and whether it generates a return on investment. Unequivocally, I know that SRIN is worth every dime.

SRIN is a website that was created to share results from research that is housed in the National Soybean Checkoff Research Database. SRIN representatives read through the research reports and boil down the information for farmers to understand and to easily implement within their operations. The site highlights state soybean research programs; profiles key soybean researchers; hosts a YouTube channel with educational videos and farmers' perspectives about production challenges; and shares diagnostic tools, agronomic tips, and pest control recommendations by state and region. Content is constantly added to keep the site

fresh and relevant, and the webpage is supplemented with a timely social media presence and a monthly e-newsletter.

I appreciate the fact that, when I go to the website, I can search through the studies by state or by research category. Everything from the latest insect, disease, and weed control advice; to soil nutrition recommendations; to in-season regional agronomic updates can be found. I have discovered ways to use the research results on my farm today and have been alerted to production challenges in other states that could come my way in the future. This is especially critical for everchanging pests such as resistant waterhemp species, sudden death syndrome and soybean cyst nematode. These heads-up details have helped me find solutions that increase my yield potential and profitability.

Soybean farmers will not find another comprehensive resource for checkoff funded research all in one place. I urge every farmer to look through the website and to learn what research our state checkoff is sponsoring as well as what other states and regional checkoff programs are funding. With all the information in one place, it has become an efficient way for scientists to avoid project duplication and to find ways to collaborate with others in order to get answers more quickly.

Bottom line, SRIN can put you in a better position to be a more successful soybean producer. I challenge you to determine how you can beat the production averages in your area by using SRIN. Just type a topic in the search



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bar and see multiple ways to dive as deep as you want into the issue.

When you visit the SRIN site, sign up to receive the monthly e-newsletter, and follow SRIN on Facebook and Twitter (@soyresearchinfo) for the latest alerts.

Use the QR code below to be directed to SRIN's website soybeanresearchinfo.com or bit.ly/SoySRIN.



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- Increase your awareness about careers in the industry.

Register for the Feeding and Fueling the World workshop at bit.ly/NDfeedfuelworkshop23



Fueling Hurricane Restoration Efforts with Biodiesel

American Grown Biofuels in States like North Dakota Come to the Rescue During Emergency Responses

If you don't have fuel, the trucks don't move," says Florida Power & Light (FPL) Fleet Fuel Operations Manager Patti Earley. "So, the fuel that we have is critical for us to be able to do the restoration efforts that we do."

FPL operates one of the most sophisticated power grids in the nation, serving 12 million customers statewide. From regular operations to assisting other states after a natural disaster strikes, FPL runs on biodiesel. The company has used blends in its fleets since 1999, and operates one of the country's largest and longest known, biodiesel-powered fleets, with approximately 1,840 biodiesel powered vehicles.

"We run all of our diesel equipment—everything from the trucks down to forklifts, lawn mowers and tractors—on biodiesel, and it takes no modifications," Earley says. "It's just a very easy thing for us to do. It makes so much sense."

FPL purchases more than 400,000 gallons of B100 (100% biodiesel) annually, blending and maintaining the fuel in two company owned terminals. Biodiesel is a renewable, clean burning diesel

replacement that can be used in existing diesel engines without modification. Biodiesel is made from a diverse set of renewable feedstocks such as soybean oil.

"When you see one of those trucks driving down the road or you're watching one of those endless news clips after a hurricane that's struck the state of Florida and you see all of those vehicles out there doing restoration, know that you are a part of that and you're helping get all those people's power back on."

Having this fuel on-hand during the 2022 hurricane season was critical for the state's restoration efforts. Thanks to mutual assistance agreements between FPL and utilities in other states, electric companies which are outside Florida send employees and equipment to help get the power back on when needed. After Hurricane Ian, FPL was fueling 13,000 vehicles each night, most of which were not part of the FPL fleet.

"There were probably thousands of those vehicles that had never run B20 before, and as far as they know, they still have never run B20," Earley states. "It's just a

seamless transition."

This blended biodiesel is also used outside the Sunshine State. FPL hauls its blends to other fleets in the country during relief and restoration efforts in order to help mitigate the fuel shortages that often accompany these major natural disasters.

"When Superstorm Sandy hit the Northeast, fuel was so short in supply, and we were up there providing mutual assistance," Earley explains. "We were hauling fuel out of Florida to take up there to help them put their power back on. There was a big snowstorm about a week after Sandy hit, so we were up there with our biodiesel. Cold weather was not an issue; we had no problems with it."

FPL has utilized different biodiesel blends, such as B35, in its operations. FPL currently uses B20 because it is selling to other fleets that have requested the lower blend.

"I think if we can get our original equipment manufacturers to warranty higher blends of biodiesel, that would go a long way to getting fleets to burn higher blends, especially fleets who don't have the experience with biodiesel

that we have," Earley asserts.

Earley is recognized in the industry as a true public servant and an inspiration.

During the Vehicle Technology Showcase at the 2023 Clean Fuels Alliance America Conference, Earley was awarded the Clean Fuels Inspiration Award for her mutual assistance leadership and her company's policies that further the use of clean fuels in Florida and beyond.

"About 17 years ago, I was lucky enough to go to work for a company that not only talks about being green and sustainable and renewable, but really puts that into practice and into action, and I'm very proud of that," Earley says. "Our company is also very proud of our biodiesel use. It's right on the side of every truck that that vehicle is powered by biodiesel."

FPL is committed to purchasing domestically produced feedstocks and is grateful for the hard work and commitment of U.S. farmers. "When you see one of those trucks driving down the road or you're watching one of those endless news clips after a hurricane that's struck the state of Florida and you see all of those vehicles out there doing restoration, know that farmers are a part of that and they're helping get all those people's power back on," says Earley.

Soybean farmers in North Dakota can take pride in knowing the soybeans they harvest are utilized across the country as renewable fuel to help fellow Americans in times of emergencies. North Dakota is a top producer of renewable diesel in the nation, which can be used in fleets without any blending requirement, while simultaneously reducing carbon footprints for companies like Florida Power & Light.

—Story and photos courtesy of Clean Fuels Alliance America and staff



North Dakota soybean farmer-leaders and staff had the opportunity to see FPL's Mobile Command Center and other diesel equipment at the Clean Fuels Alliance Conference in January.



Corporal Ann Millerbernd of Renville County Sheriff's Office proudly displays new Goodyear soy-based tires on her squad car.

Tire Grant Has North Dakota's First Responders Riding on Soy

North Dakota soybean farmers, through their checkoff dollars, are giving back to local first responders this year while promoting soy-based innovation at the same time. The North Dakota Soybean Council (NDSC) provided grants to the Barnes County Sheriff's Department, Glenburn Fire Protection District, McIntosh County Sheriff Department, Mandan Fire Department, McKenzie County's Alexander Volunteer Fire Department, Renville County Sheriff's Office, Rolette County's St. John First Responders, and Wahpeton Police Department for the purchase of Goodyear soy-based tires for their emergency vehicles.

"We are a small department with a limited budget, so this grant helps us out a lot when we can save some money on larger purchases, like tires," states Emma Nelson, office deputy with the Barnes County Sheriff's Office. "Quality tires are a necessity for our department's vehicles, as they need to be robust enough in design in order to handle the demands and operating conditions that our patrol vehicles often encounter."

The NDSC provided grants, up to \$1,000 per organization, for the purchase of Goodyear soy-based tires. The farmer-led board of directors wanted to give back to their

communities, while also supporting the various uses for soybeans.

"Many of us have had that horrifying moment where we've needed first responders, whether it be medical emergency, accident, fire or crime," says Rob Rose, the NDSC vice chairman and a soybean producer from Wimbledon. "This soy-biobased tire promotion is a way for the North Dakota Soybean Council and all soybean farmers across the state to say 'Thank You' to our dedicated, brave and selfless first responders."

Since 2017, Goodyear, supported by the United Soybean Board's soy checkoff investments, has released seven lines of tires with soybean oil compounds. The Akron, Ohio based company has

increased its use of soybeans by 73% since 2018, according to the company, and pledged to fully replace all of its petroleum driven oils with soybean oil by 2040.

"As you know, everything seems to be very expensive right now, and tires are no exception," asserts Shane Weltikol, Mandan Fire Department battalion chief.



North Dakota Soybean Council Vice Chairman Rob Rose of Wimbledon, middle, along with Barnes County Sheriff Sargent Steve Loibl, left, and Sargent Dan Anderson, right, highlight new Goodyear soy-based tires on squad cars.



Members of the Alexander Volunteer Fire Department showcase new Goodyear soy-based tires on their chief's squad car.

“Our department had already maxed out our maintenance budget for 2023. The timing of this grant opportunity fit perfectly with our engine tire needs. Mandan Fire sincerely appreciates the North Dakota Soybean Council’s generosity. The grant has enabled us to purchase a new set of tires that we can rely on to get us to and from a fire scene safely.”

“Soybeans are a popular crop in our area of the state, so we thought it would be the perfect opportunity to try these new tires, while hopefully having a positive impact for our local farmers,” states Alex Cook, Renville County Sheriff deputy.

The soy checkoff continues to conduct research and to partner with industry in order to find new ways to utilize soybean oil. With these grants, the NDSC helps promote North Dakota

soybeans, along with assisting rural communities.

“The first responders, fire departments and ambulance services that are provided in our rural areas are second to none,” says Chris Brossart, the NDSC chairman and a soybean producer from Wolford. “These individuals are the real heroes, and we’re excited to be able to give back and help these organizations. This grant is a fantastic way we can show our support just as they support each and every one of us!”

—Story by staff, photos courtesy of first responder organizations

For more information about the NDSC’s soy tire grant, use the QR code below or visit bit.ly/NDSCsoytiregrant.



North Dakota Soybean Council Director Jennifer Meyer of Wilton, right, along with Firefighter Carter Hanson, left, and Training Officer Andrew Beck, middle, feature new Goodyear soy-based tires on Mandan’s fire engine.

Get Ready to Corner the Market

NDSC Midseason Market Outlook for Soybeans

Online Webinar ▪ August 8, 2023 ▪ 8:00 a.m. – 11:30 a.m. CST

The North Dakota Soybean Council is proud to offer the Midseason Soybean Market Outlook again this year. This program provides soybean producers and industry with a midseason look at the soybean markets and a discussion about marketing strategies prior to harvest. Learn how new North Dakota soybean crushing plants could change the market.

Bill Wilson, Ph.D., and Frayne Olson, Ph.D., of NDSU will discuss how the season is progressing, the world demand, and the marketing

strategies and risk management options for the 2023 soybean harvest.

- The webinar is **FREE** and is open to North Dakota soybean producers, industry, educators and others who support North Dakota soybean producers.
- Registered participants will be provided with a link and instructions for logging in the day prior to the event.
- **Questions?** Call (701) 566-9300.



NDSU

Register before August 4
to participate

bit.ly/NDSCregisterMidseasonMarketOutlook



Dr. Bill Wilson



Dr. Frayne Olson

North Dakota Soybean Council ▪ ndsoybean.org



Integrated Weed Management is NECESSARY

North Dakota State University (NDSU) Extension Weed Specialist Joe Ikley, Ph.D., assesses the state's weed management concerns simply: "We're not going to spray our way out of the situation that we're in."

The situation in North Dakota is that herbicide resistant weeds, such as waterhemp and kochia, are increasingly prevalent, causing major weed control headaches. Simply spraying weeds once they've emerged is no longer an effective approach.

"We certainly have a lot of good chemistry that we can rely on, but we do need to look at other tactics beyond just herbicides for weed

control," Ikley says.

Herbicide's Role

Herbicides alone won't guarantee successful weed management, but they remain an important part of an overall plan.

"A residual herbicide at planting is definitely the number one priority for our tough and resistant weeds like waterhemp and kochia," Ikley explains. "That's basically a must for anymore because, with most of our post emergence chemistry, we have either resistance or some of them are only effective on very small weeds, and applications could be influenced by environmental conditions. Due to these reasons, we definitely need residual herbicides to start us off on the

right foot for weed control."

Most post emergent herbicide labels require weeds to be sprayed when they're small. A residual herbicide will slow down weed growth, giving farmers a wider window for spraying weeds when herbicide control is more likely.

Jason Hanson is a crop consultant in the Devils Lake area. A key component for weed control among his clients is diverse crop rotations.

"Anytime my rotation becomes more diversified, the better I can handle the weed situation," Hanson states. "I have one farm where it's a corn, bean rotation. I don't even have to send a sample in to confirm that kochia is dicamba resistant since there is a high likelihood that kochia has resistance to dicamba. On that same farm, I can go to other fields where they've got wheat and canola among their corn and soybeans, and weeds are extremely manageable."

Hanson describes how rotation is a huge factor because, instead of having only a warm season grass and a warm season broadleaf in a crop rotation, there is now a cool season grass and a cool season broadleaf, which is beneficial for weed control.

"Diverse crop rotations have different chemistries available with different planting times. Generally, canola and wheat help me manage my soybeans because residues from these crops cover the ground and reduce weed emergence when I plant soybeans," Hanson says.

Beyond the Jug

Ikley asserts that there's a whole suite of other tactics, including narrow row spacing and higher planting densities, which farmers can use beyond chemicals. Transitioning to narrow row spacing can

be challenging for growers whose equipment is set up for wider rows. For farmers with the option of adjusting, it may be worthwhile.

"Going from a 30 inch row down to a 15 inch row for soybeans is going to help out with weed pressure because it gets us to a quicker canopy closure," Ikley states.

Correcting agronomic issues such as iron deficiency chlorosis and soybean cyst nematode has a connection to weed control. Anything that slows the crop's growth and development gives weeds an opening to grow and outcompete the crop. Healthy and vigorous crops will compete better with weeds for resources.

Cover crops are becoming more popular and, moving forward, will be more important for weed control purposes, Ikley contends.

"We really talk about biomass accumulating cover crops, such as cereal rye, because it produces a lot of biomasses in the spring and that can help with weed suppression," Ikley explains.

Although many farmers have gone away from interrow cultivation, that practice can be effective to control many emerged plants. Weeds growing near the cash crop may escape, but cultivating will help reduce the number of weeds that produce seed.

Ikley says that new technologies, such as electric weed zappers, can be effective for killing weeds that have escaped and reach above the plant canopy. Weed seed destructors, which are attached on the back of combines, act like a hammermill, destroying weed seeds at harvest time. Both technologies are designed to reduce the number of viable seeds in the soil for future years.

"One of the ultimate goals in this age of herbicide resistance is managing the weed seed bank. Growers are going to be applying



Joe Ikley, Ph.D., says tactics beyond just herbicide applications are necessary to manage weeds.

herbicides almost every year because they're still very effective on most of our weeds," Ikley explains. "But then you get to the point where you've got those couple of species in your field that are resistant, and you don't want to have any of those weeds produce seed because that's just going to be a lingering problem year after year. So that's why we have put a lot more emphasis on

managing the weed seed bank, preventing seed production."

Hanson maintains that, because herbicide resistance is a real issue, he's not passive in his treatment recommendations.

"We are relying heavily on burndowns products; we're still going to use residual products with multiple modes of actions," Hanson asserts. "In cases where we get patches in fields or fence lines,

we've got to make sure that weeds don't go to seed. I don't care if it takes mowing, hand picking, or spraying to control weeds. Farmers and agronomists need to make a decision when it's time and do whatever it takes to control troublesome weeds."

—Story by Daniel Lemke, photos by staff and United Soybean Board

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For more helpful information from NDSU, please visit bit.ly/aghubNDSUweeds.



Prolific weeds like waterhemp and Palmer amaranth have to be controlled when they're small.



A primary goal of weed management is to keep weeds from establishing a seed bank in the soil.

Do You Know Beans?

Attend 2023 NDSU Summer Field Days Featuring Soybeans, and You Will!

The following dates are a list of the 2023 Field Days events. Please visit the Research Extension Center and Agronomy Seed Farm websites for more details.

July 10 Central Grasslands Research Extension Center, Streeter

July 11 Hettinger Research Extension Center

July 12 & 13 Dickinson Research Extension Center

July 12 & 13 Williston Research Extension Center

July 17 Agronomy Seed Farm, Casselton

July 18 Carrington Research Extension Center

July 19 North Central Research Extension Center, Minot

July 20 Langdon Research Extension Center

For more info, use the QR code or visit bit.ly/NDSUfielddays.



NDSU



Sharpening the Focus on Herbicide Resistance of *Waterhemp and Palmer Amaranth*

Most weed species are not only prolific in their reproduction, but they're also resilient and can adapt to their environment in order to survive. That ability can be problematic for farmers, and it contributes to herbicide resistance.

Treating weeds with the same herbicide repeatedly or using products with the same herbicide modes of action has hastened the emergence of herbicide resistant weeds on farms across the globe.

"Herbicides can provide strong selection pressure on weed populations, and over time, certain mutations can lead to resistant weeds," states Zack Bateson,

Ph.D., research manager at the National Agricultural Genotyping Center (NAGC) in Fargo. "As we apply more and more herbicides, especially if it's the same herbicide year after year, that's increasing the chances of that weed populations to develop a mechanism to escape the chemical control."

Bateson asserts that it can be complicated to find the genetic mutation that causes resistance because, sometimes, plants have other mechanisms that help them escape the herbicide action. Farmers may think a weed is resistant, but the real culprit may be ineffective herbicide application, or later emerged weeds.

Pigweeds, including waterhemp and Palmer amaranth, are particularly troublesome. North Dakota State University (NDSU) Extension Weed Specialist Joe Ikley, Ph.D., describes how waterhemp in North Dakota has shown resistance to four sites of action – group 2, 4, 9, 14, while Palmer amaranth in the state is resistant to five sites of action – group 2, 4, 5, 9 and 27. Other weed species, including kochia and giant ragweed, have developed resistance to some herbicides – group 2, 9 and 14.

"The good news is that there

are a couple herbicide groups and particular weed species that we've found a pretty strong genetic mechanism for herbicide resistance," Bateson explains.

Genetic testing not only helps raise awareness about the concern over herbicide resistance but also confirms whether a population of weeds is resistant to some herbicide treatments.

Mapping the Issue

The North Dakota Soybean Council is working with the NAGC on a sampling and testing program to define the extent of herbicide resistance in the state. The NAGC has developed a genetic, or DNA, test that can determine if a weed is resistant to Group 9 herbicides, which include glyphosate, or Group 14 protoporphyrinogen oxidase (PPO) inhibiting herbicides.

"What we're trying to do is to develop genetic tests that are useful to growers, Extension agents and agronomists to really increase awareness of herbicide resistant hotspots in the state. We hope to find out where these hotspots are and focus efforts on more resources, where we need more Extension and outreach to the growers, to county weed officers to help

combat herbicide resistant weeds in North Dakota," Bateson explains.

Bateson says that the genetic tests have several advantages over greenhouse trials: 1) genetic tests do not require large greenhouse space for trials and helps reduce space demand; 2) these tests can pinpoint genetic markers associated with herbicide resistance faster than a greenhouse trial.

This summer, the NAGC will distribute pre-labeled envelopes to county Extension offices and weed control officers. Agronomists and producers can also ask for these envelopes for late season pigweeds sample collection.

"For genetic testing, all we need are three leaves from a plant population that's suspected to be herbicide resistant," Bateson states. "Growers and agronomists know their fields, and they know their trouble weed spots. We want them to focus on those areas and collect a few leaves from an individual waterhemp or palmer plant from that population."

Samples should then be mailed in to the NAGC where staff will extract DNA and test for the genetic markers associated with Group 9 and Group 14 herbicide resistance.



Zack Bateson, Ph.D.

“Once we get the test results, we will send a confidential report to the grower or agronomist who submitted the sample indicating our findings,” Bateson explains. “After completing the project, we’re going to develop a statewide county map showing the distribution of herbicide resistant pigweeds in our state. This map will then be shared widely with all participants and other stakeholders.”

The question isn’t if North Dakota has resistant weeds. Rather, where are they, and how widespread is the problem? The NAGC, with the help of North Dakota State University weed scientists, conducted a pilot survey in 2022. Pigweed seed and tissue samples were collected from 16 counties last year. Fifteen of those counties had Group 2 resistant pigweeds; 12 counties had Group 9 resistant

pigweeds; and 7 counties, or 44%, had Group 14 resistance.

“When we looked at the entire dataset, there were six counties that had pigweed populations that were resistant to the three herbicides that we tested,” Bateson says.

Farmers will be hearing more about the weed sampling program later this summer. Because this round of testing focuses on late season pigweeds, Bateson would like

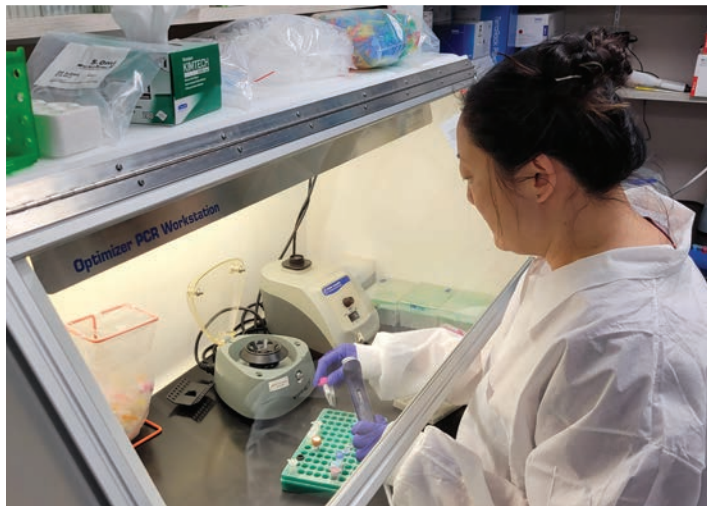
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growers to start sampling in August.

More information about this program will be available later this summer on the NAGC’s and the North Dakota Soybean Council’s websites at genotypingcenter.com and ndsoybean.org.

—Story by Daniel Lemke,
photos by staff



Farmers can send tissue samples to the NAGC to determine if their weeds are herbicide resistant.



Tests developed at the NAGC will help develop maps showing weed resistance hot spots.

NDSU Hosted 3rd Annual Soybean Symposium to Accelerate Soybean Innovation Through Cross-Disciplinary Research and Collaboration

Scientists of all disciplines were invited to participate in expanded research collaboration and opportunities at the third annual Soybean Symposium on March 30-31 at the North Dakota State University (NDSU) McGovern Alumni Center in Fargo.

The symposium was organized by North Dakota’s soybean breeder, Carrie Miranda, Ph.D., to strategically bridge multiple disciplines, including soybean agronomy, breeding and new uses research, in order to foster collaboration, to build exchanges and to develop new networks for cutting edge soybean research. The North Dakota Soybean Council (NDSC) was the major sponsor for this annual event. Other sponsors included NDSU Plant Sciences, AgriPlex Genomics and Brushvale Seed.

The symposium featured a wide variety of soybean research, including topics related to soybean production and soil health through

livestock integration, the use of soy proteins to create flexible batteries, improvements to soybean-based oils for lubrication and the production of soy-based anti-inflammatory products for human health. Additionally, the event presented research about producing superior soybeans that are specific to North Dakota’s environment. Attendees noted the speakers’ energy, particularly Surojit Gupta, Ph.D., from the University of North Dakota, who presented his work on the design and commercialization of high value soybean meal and protein products.

This year’s keynote speaker was Ed Anderson, Ph.D., senior director of research for the Iowa Soybean Association and executive director of the North Central Soybean Research Program (NCSRP). In his presentation, Anderson spoke passionately about the benefits of the soybean checkoff for research, promotion, and market

—Story continued on page 32



This year’s symposium welcomed NCSRP Executive Director Ed Anderson, Ph.D., as the keynote speaker. His passion for farming, basic and applied research, and the soybean industry drives him to pursue collaborations with the best and brightest individuals.



Laying the Foundation for Policy

The prospects of spending time in Florida during the month of March would be attractive to many North Dakotans, but for the soybean farmer leaders who traveled to the Commodity Classic, the trip had little to do with fun in the sun.

Commodity Classic 2023, which was held in Orlando, not only featured one of the largest agricultural trade shows in the world, but also hosted the American Soybean Association (ASA) delegate session. ASA delegates from across the country voted on an array of resolutions that form

the association's policy positions. State and national soybean industry leaders use those positions to advocate for farm friendly legislation in Washington, D.C.

Before resolutions reach the floor for delegate consideration, they go through a rigorous vetting process that includes state

North Dakota farmer Justin Sherlock (standing) was among the farmer leaders who took part in the American Soybean Association voting delegate session to set policy priorities for the organization.

caucuses which are held prior to the ASA vote. At the Commodity Classic, North Dakota soybean farmers caucused with delegates from South Dakota, Minnesota, Wisconsin and New York.

"The caucus process helps us flush out if it's a just a state-specific issue that needs to be dealt with on the state legislative side of things or if it truly is a federal issue that ASA will be tasked with addressing," says Ryan Pederson, North Dakota Soybean Growers Association (NDSGA) vice president, who chaired the multi-state caucus. "The caucus process also helps to show support and educate other state caucuses about why this issue is on our radar and why it should be important to them."

The caucuses are a grassroots process that allows states to bring forward and to discuss issues that



NDSGA director Ryan Pederson (center) chaired the state caucus meetings that featured farmers from North Dakota, South Dakota, Minnesota, Wisconsin and New York.



State caucus meetings gave soybean leaders from five states the opportunity to work through regional issues prior to bringing them to the ASA delegate session.

may have regional or national significance. The caucuses also help streamline the process of voting on final ASA resolutions because not all issues will be brought forward for the national body to address.

Pederson explains how the value of caucusing and sharing resolutions also includes helping the ASA thoroughly consider the ramifications of its policy.

"We need to make sure that we're engaged in Washington, D.C., as a national organization to make sure we don't have unintended consequences pop up on a regional level," Pederson states.

On the final day of the Commodity Classic, ASA members met to approve the organization's annual policy resolutions, which updated and built on existing resolutions as well as helped lead the organization to address current and emerging priorities for the U.S. soy industry.

The resolutions approved this

year highlighted soy policies, including sufficient funding for the 2023 Farm Bill, maintaining growers' access to important crop protection products, expanding the market for biobased products and supporting the production of biomass based diesel.

—Story and photos by Daniel Lemke

To download ASA's policy manual, 2023 Directory & Resolutions, please go to: bit.ly/ASA-KeyIssuesPolicyResolutions



—Story continued from page 4

Fund started with \$10 million after the last session and began this session with a \$50 million proposal which was cut back to \$25 million. Of this \$25 million, \$10 million was allotted to infrastructure for roads and bridges with the remainder helping political subdivisions, up to \$1.25 million per project, and for individuals with private projects up to \$500,000. This action was HB 1276 if you want to study it. HB 1501 attempted to take the North Dakota Soybean Council (NDSC) from state agency status to become a 501 (c) 5. The NDSC

became a state agency in 1985 before Congress made all soybean checkoffs federal in 1991. Twenty other state soybean councils have transitioned to 501s, and because the soybean checkoff is solely federal, the NDSC saw no need to continue drawing on state resources such as complex requests for proposal anytime the council spent over \$10,000; using state human resource departments for any hiring; being involved with the state motor pool regulations; etc. These, among other reasons were motivations for the NDSC board to unanimously leave redundant state regulations behind. At

that point, the North Dakota Soybean Growers Association took the lead, found a bill sponsor who understood and wanted to help, and guided the bill through the process. That bill took more turns than a roller coaster, but eventually ended up passing 47-0 in the Senate. After a battle on the House floor, the bill passed 55-36. With an effective date of July 1, 2024, nothing changes in the way that the checkoff is collected or administered. We have many cooperative legislators to thank for working on and voting for this bill, ensuring a better, more efficient use of farmer dollars. Thank you so much.

A New Era of Farm Security

Technology has ushered in a bold new world for agriculture. Technology has enhanced farm productivity and efficiency, putting more power at the farmer's fingertips. However, as more facets of agriculture become interconnected through technology, cybersecurity is becoming increasingly important for the ag industry, all the way down to individual farm operations.

Being able to upload yield data to the cloud while combining soybeans or starting grain bin fans from a phone app may be convenient, but those opportunities could also present some cybersecurity vulnerabilities.

U.S. President Joe Biden has designated the food and agriculture sector as critical infrastructure, so the government is monitoring the ag sector for concerning behavior, ranging from terrorist activity to foreign governments that have an antagonistic relationship with the U.S. Such attacks have already happened.

In 2021, a ransomware attack linked to Russian hackers disrupted operations at an Iowa grain cooperative during the hectic harvest season. The hackers threatened to release proprietary data which they claimed to have stolen from the co-op if a hefty ransom wasn't paid.

"All the data that's being generated on the farm is a huge cybersecurity risk for our farmers and for the ag sector," says Ariel Wiegard, director of government affairs for the American Soybean Association (ASA). "Not only is this confidential business information being generated and held by farmers about their businesses, but there's also potential information here that could affect markets."

Wiegard describes how, if hackers could make their way into large

data collection systems, they could potentially gather data about yields and use that information to manipulate markets before official yield information is released. Wiegard states that larger companies, such as John Deere and Case IH, have the resources to continually probe for cybersecurity weak spots, but smaller companies may not have the same capabilities.

"All of this equipment is connected, and it's all run by software. These pieces of equipment are really software in the shape of a tractor," Wiegard asserts.

"Case IH takes customer security of farm data very seriously," contends Nathan Greuel, AFS marketing, Case IH North America. "Case IH does not share data with any third party unless the customer subscribes to them and connects the accounts."

Greuel says that Case IH, through CNH Industrial, has implemented a data security program and takes all reasonable efforts to safeguard customer information.

Shortly after Russia invaded Ukraine, news circulated that a local John Deere dealership in Ukraine was able to shut down tractors to prevent Russia from stealing them.

"The first instinct is, yeah, they really got those Russians, but then, the second question that comes up is, wait a minute, if local John Deere tractor could do it, what keeps someone from outside the U.S. from doing it to us," asks cybersecurity expert Pablo Breuer. "That's got me concerned. A lot of our food production, whether it's on the farms or whether it's getting it to the market, is automated now. We need some help so that not only can the farmers be protected, but also how are we going to protect our foodstuffs? How are we going to protect our food supply chain?"

Concerted Efforts

The ASA founded an agriculture technology working group in Washington, D.C., which includes most of the major ag commodity organizations, specialty crop groups and farm organizations. Wiegard describes how the group is meant

to be farmer-focused, with the goal of helping all the organizations to learn more about ag security issues, to know what the possible policy fixes could be and to be better able to represent their constituencies on cybersecurity issues.

—Story continued on page 29



Ariel Wiegard serves as director of government affairs for the American Soybean Association.



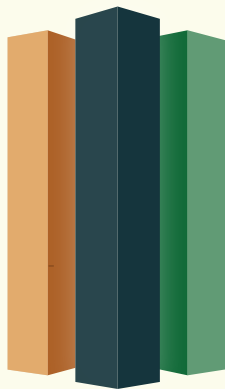
Cyber security expert Pablo Breuer is concerned with keeping America's food production system safe, including farmer's data.



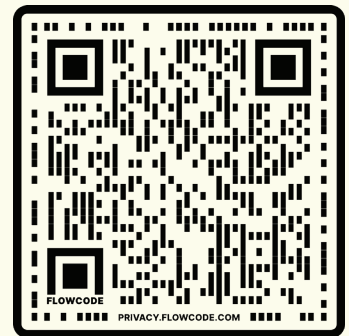
Make Moves with U.S. Soy

WISHH connects Trade, Development & Food Security in Cambodia where **fish account for 61% of households' animal protein** intake. We cultivate trade with Cambodian feed mills that are buying U.S. soybean meal for the growing aquaculture industry that WISHH is developing. Our trade and development work makes protein more available in the country where **45% of Cambodians live in moderate or severe food insecurity**.

Find out how WISHH's three pillars of trade, development and food security cultivate new markets for U.S. Soy protein.



Trade. Development. Food Security.



A SEISMIC SHIFT

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Looking Outward

Wilson's analysis shows that three operating soy processors in North Dakota would produce about 3 million tons of soybean meal each year. The current production is about 36 tons per year.

"Then, the big challenge is what are we going to do with the meal. A large portion of the meal will have to be exported, and over time, a livestock industry will develop to consume a portion of that meal, but how much, we don't know," Wilson asserts.

North Dakota has been a leading exporter of whole soybeans through ports in the Pacific Northwest. Increased processing capacity means that meal exports will become more of a focus. However, entering the realm of soybean meal exports is an entirely different ball game, and the field is crowded.

"There's very intense competition led by Argentina and Brazil and then North America," Wilson says, "and then within North America, we compete the Pacific Northwest versus the Gulf in all

The soybean industry in the U.S., and in North Dakota in particular, is undergoing a dramatic change. The thirst for low carbon fuels such as renewable diesel is driving expansion for soybean processing because soybean oil is a primary feedstock for renewable diesel.

Two soybean processing plants are under construction in North Dakota, and another plant is proposed. According to analysis from North Dakota State University (NDSU), as many as 18 new soybean crushing facilities of various sizes could be operating in the U.S. by 2025.

"My view is the advent and development of renewable diesel is one of the most important structural changes that's occurring in North American agriculture, maybe the world," says NDSU Distinguished Professor William Wilson, Ph.D. "It has a huge impact on North Dakota because we're a large producer of soybeans, but it's having an effect on many of the other states as well."

North Dakota is a leading

soybean exporter, but dynamics will likely soon change. The Green Bison Soy Processing facility in Spiritwood will take delivery of soybeans this fall. The facility will have the capacity to handle 150,000 bushels of soybeans per day. The North Dakota Soybean Processors plant in Casselton is expected to handle 42.5 million bushels of soybeans per year when it opens in 2024. A third proposed plant near Grand Forks would also draw in North Dakota soybeans.

"If all three of the plants were developed, we would consume 146 million bushels in the state, and we normally produce 198 million bushels," Wilson explains. "That means instead of exporting that volume of soybeans, we'll be consuming it domestically in the state."

Utilizing 146 million bushels of soybeans for processing each year would leave about 52 million bushels of annual production for whole bean exports.

"We're undergoing a very pivotal change that will have a very big impact on how we talk about and promote North Dakota soybeans and soybean products," states

North Dakota Soybean Council (NDSC) Executive Director Stephanie Sinner. "For years, the markets have been whole beans, whether that's identity preserved, whole bean or yellow number two commodity beans. Now, we've got soybean meal, oil and other meal byproducts."



Hog production in the region should benefit from the availability of additional soybean meal.



The Green Bison Soy Processing facility in Spiritwood will have the capacity to handle 150,000 bushels of soybeans per day.

of those markets. Generally speaking, soybean meal through the Pacific Northwest is higher valued than all of the competitors. That, ultimately, means that meal values are going to have to fall in order to be competitive domestically as well as internationally.”

Even though over 120 countries around the world import soybean meal, Wilson explains that there will be tough competition for those markets no matter where

North Dakota meal is exported. He expects that the greatest likelihood of success would come from exporting into Asian markets, notably Indonesia, Vietnam, the Philippines, Thailand and South Korea. However, price could be a limiting factor.

Wilson describes how U.S. export values of meal through the Pacific Northwest are currently overpriced by about \$18 per metric ton compared to international

competitors. In order for North Dakota meal to be more competitive, some combination of a lower export basis; a lower interior basis; or a combination of other factors, including reduced crush margins, lower rail rates, or lower soybean prices, will be necessary.

Close to Home

Domestic markets present an opportunity to use some of the soybean meal that will be produced in North Dakota. Neighboring states such as Minnesota and Iowa have robust livestock industries, but processors in those states already produce huge volumes of soybean meal to feed the animals.

Having access to large amounts of soybean meal is one key factor for the potential growth of animal agriculture in North Dakota. Analysis shows, based on the availability of soybean meal, North Dakota could support a swine herd between 600,000 and 2 million animals.

“There’s already substantial domestic production of livestock within the United States of all species, so it’s not like we’re entering a new market where nobody’s there,” Wilson states. “For us

to enter into the U.S. livestock industry, we’re going to have to be competitive with other states that are already producing livestock. For us to compete in that world, we have to be, ultimately, a better product or lower cost suppliers relative to those other states and regions. It’s true there will be more meal available in North Dakota, but in reality, there’s going to be more meal available for livestock throughout the entire country.”

Sinner confirms that the NDSC is focusing efforts on gaining a better understanding of the challenges and opportunities that will come about as the state’s soybean industry evolves.

“Once we start getting meal produced in the state, we’ll need to confirm that the quality of the meal follows the exceptional nutritional value buyers can expect North Dakota soybeans to provide,” Sinner says. “It just means a broader stroke of products that we get to work on promoting on behalf of North Dakota soybean farmers. This is a big change for North Dakota. It’s exciting, and the checkoff is at work trying to make sure we don’t leave market share behind.”

—Story by Daniel Lemke,
photos by staff and courtesy of Green
Bison Soy Processing



Dr. Wilson’s analysis shows that North Dakota soybean meal price and quality will be factors in market penetration.



North Dakota’s soybean processing capacity will change dramatically in the coming months, putting soybean meal, oil and hulls into the market.

Keys to Achieve Effective *Weed Management*

Checkoff
Investment



employ several different active ingredients in an effort to cover a broader spectrum of weeds. Properly mixing different ingredients involves much more than dumping and stirring.

“To avoid costly mistakes when mixing herbicides, farmers need to be patient and mix those pesticides in the proper mixing order and allow the pesticide to be properly rinsed out of the mixing cone before they introduce another product,” Thostenson states. “When you mix two active ingredients in the cone at the same time, before you know it, you’ve got a tank mixing compatibility problem.”

Farmers and applicators need to take time and follow proper mixing order when spraying herbicides and other crop protection products.

Thostenson says the 2023 North Dakota State University Weed Control Guide includes information about the proper mixing order. That publication is available by using the QR code below or visiting bit.ly/NDSU23weedguide.

Thostenson describes how, with the spring’s cold water, it takes longer for herbicides to mix into a solution, so applicators need to be patient about making sure that the material is being properly introduced into the system and that the process isn’t being rushed. Consistent, rolling agitation in the spray tank also helps with proper mixing.

Adhering to the application requirement on the herbicide labels, which specify the necessary nozzles and spray pressures, will help to maximize the application’s effectiveness.

—Story by Daniel Lemke, photos courtesy of United Soybean Board

2023 North Dakota
State University
Weed Control
Guide



At one point in time, simply hooking up a sprayer and hitting weeds with a dose of post emergence herbicide may have been enough to provide effective control. But those days are long past, and the process for achieving maximum weed control with herbicides is more complicated than ever.

Because the window for effective weed control may not be open long, a key message from North Dakota State University Pesticide Program Specialist Andrew Thostenson is to not waste time.

Before the planting and spraying season even begins, Thostenson states that farmers and applicators should get the training necessary to apply products such as dicamba and paraquat, so there are no delays when conditions are right for herbicide applications.

Another pre-season step that

farmers can take is to make sure they can get the crop protection product they want and to have it available so that they aren’t delayed by potential supply chain issues. That requires farmers to know what their biggest weed challenges are so that the correct products can be applied.

“They really need to know what their primary, secondary and even third level pest problems are before trying to attack them,” Thostenson asserts. “That’s especially important with the problems that we face with resistant weeds. We need to know what we’re up against. We target our herbicide application in certain directions based on what weed spectrum we’re dealing with.”

Thostenson states that a recipe for a weed control disaster is to rely exclusively on post emergence products. He prefers a multi layered approach.

“If I had my druthers, I would like to see somebody do a burn down so that we’re starting with the clean seedbed, then going with a pre-emerge,” Thostenson explains, “maybe then going with a layered pre and then coming in with a post emergence product. I know that sounds really expensive, but it doesn’t take a lot of water-hemp and kochia to really ruin your day. As prolific as they are, you’ll soon have a bigger problem if there’s even a small percentage that escape.”

If weather conditions delay the start of field work, it can be tempting to skip some steps just to

get seed in the ground. Thostenson understands the urgency, which is why he advocates for farmers to be prepared before the rush.

“That’s why you need to focus all your attention on being ready to go ahead of time so that you can maximize the time in the field actually doing the spray job,” Thostenson maintains.

Efficiency is Key

Weeds are best controlled when they’re small, in many cases, smaller than two inches in height. Once weeds get beyond that height, weed control diminishes. Because weeds can grow rapidly, when it’s time to spray, that task should become a priority.

Thostenson reveals how research from a colleague in Canada shows that a sprayer is actively spraying about 34% of the time that the implement is running. The rest of the time, the machine is filling, traveling or idling. “This means that you need to do anything to improve your efficiency so that you can increase the time that you’re actually spraying in the field,” Thostenson contends.

Because the optimal herbicide application window can be tight, Thostenson says that, if they have a lot of acres to cover, farmers may want to consider enlisting the help of aerial applicators in order to make timely applications.

Mixology

As herbicide resistance becomes increasingly problematic, farmers frequently use tank mixes that



Andrew Thostenson, NDSU
Pesticide Program Specialist

Soybean Gall Midge Likely to Be in North Dakota

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The soybean gall midge was first documented in Nebraska in 2011 and was described as a new species in 2018. This pest has since been found in Missouri, Iowa, Minnesota, and South Dakota. North Dakota State University (NDSU) Professor and Extension Entomologist Janet Knodel, Ph.D. has been checking for its presence in the state for several years and has come up empty so far. However, the soybean gall midge may have finally reached North Dakota.

“My postdoctoral scientist Veronica Calles-Torrez, the Integrated Pest Management (IPM) crop scouts, and I started surveying North Dakota soybean fields for soybean gall midge infestations in 2019, and people kept saying that we must have it,” Knodel says. “Through the IPM Crop Survey since 2020, we have kept increasing the number of fields scouted.”

North Dakota was in a drought during 2020 and 2021, which doesn’t favor the biology of most gall midges. The insect prefers moist soil for survival, so Knodel, and her team weren’t surprised when they didn’t see midges in

those years. However, 2022 proved to be different as drought conditions ended in most of the state.

“In mid-August, Brandon Schulzetenberg, a Centrol crop consultant, alerted us to a possible soybean gall midge infestation in a soybean field near Gwinner in Sargent County,” states Knodel. “After looking at the pictures he sent of larvae in the stem lesion (Figure 1), and the lack of white mold infection in the field, we quickly visited the site.”

After more than eight hours of scouting, researchers finally found at a field’s edge one stem with a lesion that had about 10 tiny, white to orange-reddish larvae. The lesion was located mid-plant, which suggests this was the second generation of soybean gall midge. Knodel noted that the density of the infestation was obviously very low due to the difficulties with finding one midge-infested stem.

The team collected the larvae and sent them to Justin McMechan’s entomology laboratory at the University of Nebraska to determine with DNA testing whether they were a match for soybean gall midge or white mold gall midge.

The DNA test results indicated an 89-92% match for soybean gall midge, which was inconclusive due to poor sample quality. However, the DNA test results for white mold gall midge was 100% negative, and white mold was not present in the field where the larvae were found, allowing Knodel’ team to rule out this species.

“We believe this will be the first positive identification for soybean gall midge in North Dakota; however, we will need to continue surveying and collecting more larvae in 2023 to confirm its species identification and presence in other soybean production areas of North Dakota,” explains Knodel. “NDSU Extension Entomology has been quite proactive in surveying for soybean gall midge due to support from the North Dakota Soybean Council and the North Central Soybean Research Program (NCSRP).”

Identifying and Scouting for Soybean Gall Midge

“There are complications with scouting for the soybean gall midge, as it is easily mistaken for a beneficial look-a-like,” Knodel contends. “Present in NorthDa-

kota, the white mold gall midge feeds on *Sclerotinia sclerotiorum*, the fungus that causes white mold in soybeans, and these two midges, especially the larval stage, can be easily confused.”

—Story continued on page 27



Figure 2. Soybean gall midge larvae in a stem (V. Calles-Torrez, NDSU)



Figure 1. Soybean stem infested with “suspect” soybean gall midge larvae from Sargent County, North Dakota. (B. Schulzetenberg, Centrol Crop Consulting)



Figure 3. White mold gall midge larvae feeding on a white mold-infected stem (J. Moisan-De Serres, Laboratoire d’Expertise et de Diagnostic en Phytoprotection, Ministère de l’Agriculture Québec, Canada)

NDSU's Ag Policy and Trade Center

Looks to the Future

Sandro Steinbach, Ph.D., brings a wealth of global experience to his role as the new director of the Center for Agricultural Policy and Trade Studies (CAPTS) at North Dakota State University (NDSU). Steinbach grew up near Berlin, Germany, and started his undergraduate schooling in agriculture science. He studied in France, Switzerland, Austria, and Russia, where he lived and worked for a while.

Steinbach then considered going back into farming, but after the financial crisis of the late 2000s, securing the financing support to acquire a farm wasn't possible.

"So that's when I decided to turn to the 'dark side' and became an economist," Steinbach jokes.

He continued his education in agricultural economics at Humboldt University in Germany and later moved to the University of California, Davis, before completing his doctoral studies in economics at the Center of Economic Research, which is part of the Swiss Federal Institute of Technology in Zurich, Switzerland.

Steinbach was an assistant professor at the University of Connecticut before joining NDSU as an associate professor in the Department

of Agribusiness and Applied Economics and directing the center.

"The center's purpose is to enhance farm income in North Dakota through in-depth trade and agricultural policy research for crop producers, ranchers, and decision makers in private and public sectors. CAPTS focuses on economic research and outreach activities for the Northern Plains region," Steinbach explains.

The center's research portfolio includes farm, food, and trade policy; macroeconomic issues; farm income; agricultural competitiveness; the economics of bioenergy production; and more.

Steinbach says that many U.S. agricultural policies are broadly applied, so farmers in Texas are treated the same as growers in North Dakota, where production methods and weather/climate concerns are very different.

"The center's mission is to help improve farm policies through sound economic research and outreach. It is critical that those policies are designed to respond to the specific agronomic conditions and challenges that farmers and ranchers in the Northern Plains face," Steinbach states.

A particular focus of the center

is issues related to international trade and macroeconomic conditions as well as their implications for farm income.

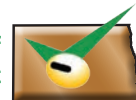
Steinbach contends that all farmers are well aware of the effect that trade uncertainty and policies can have on the farms. The trade war with China sent soybean exports plummeting. Policies established by the Trump and Biden administrations have considerably affected markets for North Dakota agricultural products.

The landscape of North Dakota agriculture is constantly changing. The construction of two (potentially three) soybean crushing plants and the opportunities they could bring are examples of that ongoing development.

"The center will be a place to exchange thoughts and work on sound economic policies," Steinbach asserts. "We don't want to react, but, instead, we want to anticipate changes and think about the implications of those shifts for North Dakota agriculture."

Steinbach describes how he's meeting with stakeholders, agricultural associations and others to better understand the needs for the agriculture industry and to help de-

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fine a long-term vision for moving the agriculture sector forward.

"For me, becoming the center director is an opportunity to visit with stakeholders and with partners to think about where we want to head in the next 25 years. We need sound agricultural policy and trade research and outreach to ensure a vibrant agricultural industry for generations to come," Steinbach says. "I think having an academic institution such as the Center for Agricultural Policy and Trade Studies, which specifically targets the needs that we have in North Dakota and the wider Northern Plains, is something unique and a great opportunity to bring together stakeholders from the agricultural industry, policymakers and academic researchers."

—Story by Daniel Lemke,
photos courtesy of Sandro
Steinbach and Adobe Stock

Learn more about the center,
by visiting bit.ly/CAPTSndsu.



Sandro Steinbach, Ph.D. director of the Center for Agricultural Policy and Trade Studies (CAPTS) at NDSU.



Bismarck's Gateway to Science Center Features Agricultural Science

North Dakota's Gateway to Science opened its new 43,000 square foot, hands-on science center in Bismarck during the first weekend in March.

The new facility greatly expands the valued resource to better serve students and families throughout North Dakota. Gateway to Science features interactive experiences that highlight science, technology, engineering, and mathematics (STEM) industries and careers.

The Growing Science area is all about the science of agriculture. The North Dakota Soybean Council is proud to sponsor Virtual Farm, an experience that puts the visitor in the role of a farmer.

North Dakota farmers will

benefit from PK-12 students, educators and the public gaining knowledge about how food gets to their tables. Gateway to Science inspires students (and the adults advising them) to consider further study and careers in agriculture in our state. Ultimately, the goal of the Virtual Farm experience is for everyone to be an informed citizen.

To make Virtual Farm a reality, Gateway to Science worked with Chaos Theory Games, a software company in Sydney, Australia, and the Science Museum of Minnesota in St. Paul, Minnesota. Subject matter experts from several North Dakota commodity organizations, including North Dakota Soybean Council's retired research director, Kendall Nichols, lent their expertise

to the exhibit's development process.

"Our goal is to provide a fun and engaging experience that accurately demonstrates for our visitors the science behind the decisions farmers make as stewards of the land, while maximizing their yields," says Kim Eslinger, Gateway to Science gallery and exhibits director.

Virtual Farm is focused on a tabletop touchscreen and utilizes Radio Frequency Identification (RFID) technology to record visitors' choices. The Virtual Farm experience has two phases: a preparation phase and a growing season phase. In the preparation phase, visitors make choices about how to approach their growing season by selecting a group of RFID cards. Virtual Farm simulates the many decisions that a farmer must make each spring prior to planting, allowing visitors to pick farming methods, equipment, crops, water and pest-management options, and whether to invest in crop insurance. The consequences for those decisions play out during the game as the growing season is simulated.

As the virtual farmer locks in their choices by placing cards in the reader, the fields in their quadrant of the screen are planted by using the farming method that they chose; then, the selected crop or crops begin to grow. If they chose irrigation, pivot irrigation arms appear and are ready for

use when the farmer wants them. Throughout the growing season, randomized conditions appear, and the virtual farmer needs to decide how to react to get the best yield for the fields.

Each growing season lasts a few minutes. During a season, the farmers may have to deal with a storm or drought that sweeps across all of the fields and hits some farms harder than others, just like in real life.

In addition to the Virtual Farm experience, visitors to the Growing Science area will find more interactive exhibits that explore the science and technologies which are essential to agriculture. Animal Sounds allows visitors to listen to the heart, lungs and gut of a steer in order to learn about healthy body sounds and to detect signs of sickness when in the role of a veterinarian or rancher. Dairy farmers use technology, such as the Cow Monitor, every day to observe their cows. Gallery visitors will check the data from these monitors for a virtual herd of their own and will evaluate each cow's health status. The Soil Columns exhibit illustrates the various soil types across North Dakota and determines which plants will grow and thrive in each region.

Other gallery areas tell the story of innovation and opportunity in North Dakota with exhibits on energy, healthcare, transportation and more. In addition to an expanded gallery, the education wing of the new building features a lab, indoor and outdoor classrooms, and a flexible maker space.

—Story courtesy of Gateway to Science, photos courtesy of Jennifer Meyer



North Dakota Soybean Council Director Jennifer Meyer of Wilton, and her daughter, Jasmine, interact with Gateway to Science's new Virtual Farm display.

To learn more about Gateway to Science's building project, STEM programs and outreach throughout North Dakota, visit gatewaytoscience.org.



Planting Seeds of Knowledge



Farmers may seed a crop each year, but the North Dakota Soybean Council (NDSC) is helping to plant a lifelong understanding about the importance of agriculture in the youngest generation.

The NDSC participated in the new Harvest of the Month program by arranging school visits by local farmers and NDSC staff to educate students about soybeans, along with reading to students in class. In fall 2022, the NDSC sent books and educator guides to every North Dakota elementary school, which is approximately 350 schools, to provide teachers educational resources for the school year.

“Harvest of the Month is a program that is partnered between the North Dakota Department of Public Instruction (NDDPI) and the Department of Agriculture as an educational program in the farm-to-school nutrition initiatives,” says Amanda Olson, Farm to School Specialist with the NDDPI. “Each month, a different commodity or food raised in North Dakota is featured with facts and educational resources.”

Soybeans were the commodity of choice in March.

“When we heard about the

Harvest of the Month program, we knew we wanted to provide some additional information and resources for the elementary schools that they could use for years to come,” explains Shireen Alemadi, NDSC outreach and education coordinator. “We sent each elementary school in the state two soybean-related books and the accompanying educator guides that had a variety of activities to connect with the books.”

The books that the NDSC sent were “My Family’s Soybean Farm” by Katie Olthoff and “Full of Beans: Henry Ford Grows a Car” by Peggy Thomas.

“Many students in the largest cities and even some in smaller cities and towns in North Dakota have limited knowledge of all the crops grown in North Dakota and the different uses of each. With soybeans being one of the top crops in the state, we wanted to make sure that each elementary school has some educational resources specifically about soybeans,” Alemadi states.

Farmer Involvement

Beyond just providing books, soybean farmers and NSDC staff went into the schools to read the books and to interact with students in order to help them

learn more about soybeans and North Dakota agriculture. Personal visits were made to Sawyer Public School, Kindred Elementary School, Central Elementary School in Tioga, and Minto Public School.

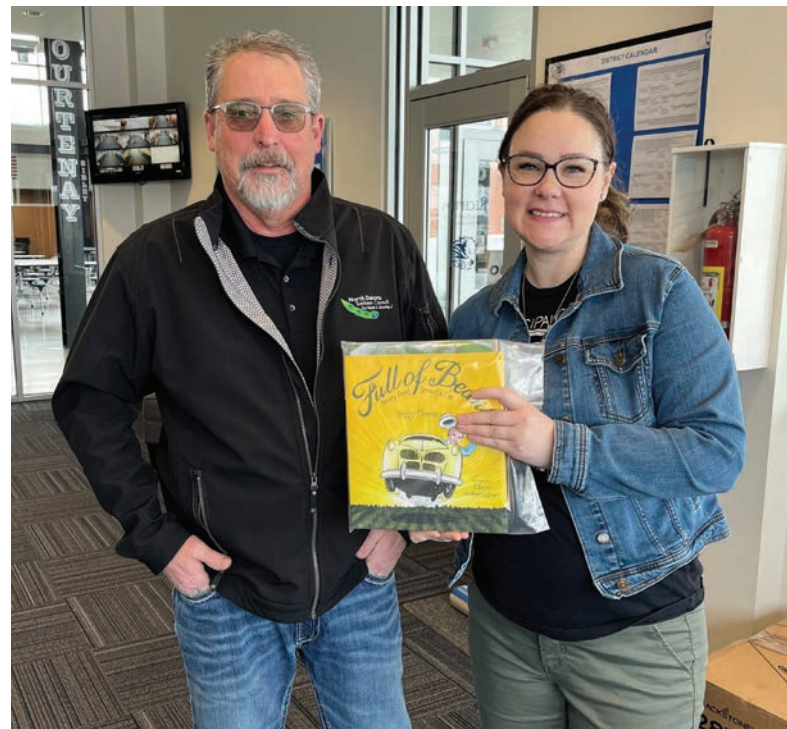
Stanley, North Dakota, farmer Aaron Skarsgard volunteered to read at his local elementary school. He describes how the students were excited to listen to a farmer

explain the day-to-day workings of a farm and to learn about all the ways soybeans are used.

“They seemed to be very interested in the many uses of soybeans and how important they are in our everyday lives as well as the impact they have on our economy,” Skarsgard asserts. “They asked a lot of very good questions, and I was happy to see that there was such an interest in our industry.”

Even in a rural state that relies heavily on agriculture, most of North Dakota’s population isn’t directly involved with farming, so there’s ample opportunity to share the story of agriculture.

“It is important to remind people of the significance of the agriculture industry in our state. Even if they are not involved in agriculture, it touches everyone’s lives, every day,” Skarsgard contends. “Agriculture is and will continue to be a large part of our state’s economy and a driver in our workforce. It is also important to assure people that we will



North Dakota Soybean Council Vice Chairman Rob Rose delivers new soybean-related books to Barnes County North Elementary School Principal Danielle Bosse.

continue to do our job efficiently to help provide our world with a consistent and safe food supply. We are fortunate to be one of the top agricultural states in the nation, and this is something we should all be proud of.”

NDSC Director of Market Development Jena Bjertness read to her son’s kindergarten class. She says that quite a few of the students had some familiarity with soybeans, but “many were not aware of the wide variety of uses for soybeans. Now, they know soybeans are ‘the magic bean!’”

Bjertness explains that sharing

the farming story in a community rooted in agriculture prompted productive conversations among the kindergarteners.

“We talked about the grain elevator in town, what their role is, and why we see and hear trains going through town so often,” Bjertness states. “A couple of students who have beef cattle talked about the corn and soybeans they feed to their cattle, and we discussed why both are needed for a complete ration. The awareness of agriculture all around us starts at a young age.”

Teacher Approved

Shelia Kolschefski is K-8 title, library and learning recovery coordinator at Sawyer Public School in Sawyer, North Dakota. She describes how many of the students who heard NDSC intern Katelyn Duchscher read the soybean focused books showed a definite interest in the topic. Having farmers or people involved with the ag industry come to the school makes the subject more relatable.

“I think it is important to provide opportunities to come and connect with our school because

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many of the students, even in our rural districts, do not get much experience in agricultural topics when they don’t live on a farm,” Kolschefski contends. “There is so much more direct and personal information that they able to bring to share.”

Victoria Vollmer is the K-6 science teacher at Central Elementary School in Tioga. She is also Miss North Dakota Agribusiness. She confirms that her students were excited to hear about what Skarsgard did on the farm.

“I feel that educating students is important, not only about soybeans, but also about agriculture,” Vollmer says. “Students should know where their food comes from and who it comes from. These are the people that help to put the food on your plates, clothes on your back and gas in your tanks.”

“Harvest of the Month is one of the many projects that we hope to continue to educate on agriculture, local foods and nutrition for all North Dakotans,” Olson explains. “Our state is so unique, and showcasing all of the wonderful food producers grow in this state is a highlight of my day.”

—Story by Daniel Lemke, photos by staff and courtesy of Rob Rose and Aaron Skarsgard



Soybean farmer Aaron Skarsgard of Stanley speaks to his local elementary school about his profession and the soybean industry in North Dakota and the U.S.

—Story continued from page 23

Knodel says that the white mold gall midge is found in North Dakota and other states on crops such as dry beans and sunflower, which also can be infected with white mold.

Because of the similarity between the two midge species, the best way to correctly identify species is to send any larvae or midge suspected of being a soybean gall midge to a lab for positive

identification.

The possible positive identification of soybean gall midge in North Dakota is not the best news farmers could receive. Knodel and the IPM crop scouts will keep a diligent watch and will offer help for farmers with managing this pest. Farmers and agronomists are encouraged to keep this pest in mind when scouting soybean fields this season. If white or orange larvae in the stems of soybeans is found

(Figures 2 and 3), please contact your local county Extension Agent or NDSU Extension Entomology for correct identification and management strategies.

To learn more about the research results of NCSRP’s funded projects, along with findings of other state soybean checkoff board funded research across the country, including research funded by the North Dakota Soybean Council, please visit the Soybean Research & Informa-

tion Network (SRIN) website at soybeanresearchinfo.com.

—Story and photos courtesy of the Soybean Research and Information Network

For more information about the soybean gall midge, scouting and identification, use the QR code or visit bit.ly/NDUSoygallmidge.






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KEEPING THE FUTURE OF SOYBEANS BRIGHT

From researching new uses for soybeans to identifying new markets for U.S. soy, the soy checkoff is working behind the scenes to create new opportunities and increase profits for soybean farmers. We're looking inside the bean, beyond the bushel and around the world to keep preference for U.S. soy strong. And it's helping make a valuable impact for soybean farmers like you.

See more ways the soy checkoff is maximizing profit opportunities for soybean farmers at unitedsoybean.org

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A Tool for Net Returns of Carbon Farming Allows Producers to Evaluate Carbon Farming Contracts

Producers looking to calculate financial returns from carbon farming contracts can use a newly updated resource from Iowa State University Extension and Outreach.

The Carbon Farming Decision Tool allows U.S. farmers to input data about different farm attributes to calculate the net returns for the generated carbon credits. This decision-making tool uses

Microsoft Excel software and is free to download and use.

—Story by Daniel Lemke, photo courtesy of The Creative Treatment

Learn more:
bit.ly/EvaluateCarbonFarmingContracts



Soil sample for determining carbon content.

—Story continued from page 18

“There isn’t a whole lot of depth to the bench on technology issues in agriculture policy,” Wiegard admits. “We created this ag tech working group last year to help the entire sector in D.C. better understand what the risks are and how to respond to them.”

“Agriculture uses a lot of modern technology, and farmers are amazing, brilliant people, but they’re not cybersecurity specialists any more than I’m a farmer,” asserts Breuer.

Unlike just about every other critical sector, Breuer states that the federal government has not funded a center to help agriculture with cybersecurity concerns. Other critical national security sectors, including finance and medical, have Information Sharing and Analysis Centers (ISACs) that are owned and run by the members of that sector.

“In part, the funding comes from the federal government, but nobody’s done that for agriculture yet,” Breuer says.

In February, Texas Congressman August Pfluger introduced the Food and Agriculture Industry Cybersecurity Support Act, which is intended to create a one-stop shop for the cybersecurity needs of American farmers and ranchers.

The bill is designed to strengthen the industry’s cyber resilience in the agriculture sector by streamlining federal operations and increasing coordination with the private sector.

The bill creates a clearinghouse for the food and agriculture industry within the National Telecommunications and Information Administration (NTIA) that will offer cybersecurity advice which is tailored to agricultural producers and will operate a helpline for people needing additional resources, including instructions for how to respond to ransomware attacks. The bill also requires the NTIA to coordinate efforts with key stakeholders, such as the Department of Homeland Security’s Cybersecurity and Infrastructure Security Agency (CISA), the Department of Agriculture, the Department of Energy, the Department of Health and Human Services, and industry trade groups, in the public and private sectors.

Farm Concerns

If farmers have concerns about the security of their operation, Wiegard explains that CISA offers cybersecurity audits to any business for free.

“If a farmer is worried about what their possible vulnerabilities might be, that would be a good place to

start, to have somebody come in and see how secure their system really is and make recommendations on what they can do to tighten it up,” Wiegard contends.

Farmers should also talk with their value chain partners and find out what is being done to secure the systems and make sure that everyone playing a part to make sure that the food and agriculture system stays safe.

Beyond cybersecurity threats, Breuer says that farmers should be aware of what information is being gathered by their automated data collection services and who has access to it.

“Especially now with all the automated machinery, farmers create a lot of data that is very useful and is of great economic value,” Breuer maintains. “When you look across industry, whether it’s equipment manufacturers or Facebook for social media or whether it’s Google or Amazon, these companies are offering free services or discounted services because the data they get from farmers using those products is more valuable than the product itself.”

“First and foremost, our core principle at Case IH is ensuring

our customers have control over their data and can choose who has access to their data,” Greuel explains. “If a customer accepts the End User License Agreement (EULA), connected equipment transmits machine performance and diagnostic data as well as field data. Farmers control who has access to their data and can confirm the legitimacy of trusted partners, who also are also required to accept the End User License Agreement. Farmers can restrict access to any machine data by canceling AFS Connect telematics services.”

Breuer says that farmers should know what data are being collected and why because there is tremendous value in the information that farmers generate.

“Now’s the right time to start having the discussion among farmers and within the agricultural industry itself because they should be able to monetize their data,” Breuer asserts. “Who owns it? How is it going to be used? Who gets to decide? There’s a different discussion that we need to have with the federal and state governments and those who are reaping the financial benefits from farmers’ data.”

—Story by Daniel Lemke, photos courtesy of Pablo Breuer and ASA

North Dakota Wetland Bank Now Open



Farmers in North Dakota now have options for mitigating potential wetland effects for ditch or drainage projects on their farmland. The Ag Wetland Trade was established by six regional agricultural groups, including the North Dakota Soybean Growers Association (NDSGA), to provide farmers with an efficient and cost-effective program for mitigating wetland conversions while providing incentives for landowners who volunteer to restore, enhance or create wetlands.

The nonprofit called North Dakota Agricultural Mitigation (NDAM) sponsors the Ag Wetland Trade, which is a U.S. Department of Agriculture (USDA)-Natural Resources Conservation Service-approved and grant-funded wetland bank.

The goal of NDAM's Ag

Wetland Trade is to work with North Dakota landowners in order to establish wetland banks on properties by restoring, enhancing or creating wetlands to sell to agricultural producers who propose to affect wetlands under the Swampbuster provisions.

"The driving mission of NDAM is to provide mitigation options to farmers in the state that have to navigate the Food Security Act, also known as Swampbuster," says Matthew Retka, a soil scientist with Stantec. NDAM is contracting with Stantec to provide engineering and technical services for the program. "It provides producers that have to navigate those regulations with options to mitigate or move wetlands on their farm for their drainage project. There's an ancillary benefit to put habitat and wetlands back on the

landscape for the people that want them or need mitigation for their farm."

Retka describes how agriculture is the driver because farmers in the state need mitigation options, but the wetland bank provides a conservation benefit as well.

The Ag Wetland Trade provides the platform for USDA program participants to purchase wetland mitigating credits to offset wetland losses from drainage or other field improvements.

"Typical buyers are producers that have a tile drainage project or a ditch project that has impact or would drain a wetland on their property," Retka states. "There's a secondary, but similar, scenario where a producer might be out of compliance because of a past drainage project. Under the same purview of rules, they could get back into compliance through mitigation."

NDAM is searching for willing landowners who have the potential to host wetland bank sites for mitigation credits. Banks sites need a Certified Wetland Determination through the NRCS Form-1026 process. After identifying potentially suitable sites, Stantec and NDAM will coordinate bank development and will determine an estimate of credit yield from the property as well as approximate establishment costs. In exchange for allowing the development of an easement-protected wetland bank on their property, with the easement held by NDAM, the landowners will receive 80% of the revenue from the sale of the credits. NDAM will collect the remaining 20% of the credit revenue to cover bank-site management and maintenance as well as other associated program expenses.

Retka contends that land which could be a good option for the wetland bank includes any land that allows hydraulic modification to restore or to create a wetland.

"The best sites are land with poorly functioning drainage ditches that can be easily restored back to their natural wetland state," Retka explains. "One really prime example is the expired Conservation Reserve Program areas that had some pre-1985 drains, which can sometimes be rolled right into the program, but there really are a lot of options."

The Ag Wetland Trade was established by the NDSGA, the Dakota Corn Growers Association, the North Dakota Farm Bureau, the North Dakota Farmers Union, the North Dakota Grain Growers Association and the U.S. Durum Growers Association. Each group invested funds to get the process started, but NDAM has since received NRCS funding for the program.

The Ag Wetland Trade is in its infancy in North Dakota, but Retka expects the demand for wetland mitigation to be strong. Stantec works with a similar program in South Dakota, which Retka says has seen more demand than supply.

"From the inquiries we've been getting in North Dakota since we got our website up and running and had some meetings, there's definitely people interested in buying credits," Retka maintains.

The Ag Wetland Trade is solely for agricultural projects, not commercial development. Retka states that the bank doesn't help satisfy any U.S. Fish and Wildlife Service easement issues. The Ag Wetland Trade is specific to NRCS compliance.

—Story and photo by Daniel Lemke

**Farmers interested in
purchasing or selling credits
can learn more at
bit.ly/NDAgWetlandTrade or
can call Matt Retka at
(701) 893-2322.**



Title I Adjustments

Could Enhance Effectiveness of the Farm Safety Net

Title I of the farm bill provides the portion of the farm safety net that assists farmers through major market shocks. This requires program trigger levels be high enough to provide benefits when needed and that payment rates are sufficient to enable solvency. The effective reference price (ERP) and Agriculture Risk Coverage-County (ARC-CO) program currently contain arbitrary calculation limits that impact the ability of Title I to fully realize these objectives.

ERP and ARC-CO Background

The two largest programs in Title I, ARC-CO and Price Loss Coverage (PLC), both utilize price and fixed, historical acreage in determining farmer benefits, but the programs have important differences. Producers cannot be simultaneously enrolled in these ARC-CO and PLC programs but can make a crop-by-crop enrollment election.

PLC benefits are determined by the difference between the ERP and the national marketing year average price for a commodity. This amount is multiplied by the PLC yield and base acres for a farm, as well as a few other factors. The PLC yield and base acres are determined by historical production on a farm to decouple current planting decisions from program benefits. The effective reference price is the higher of the statutory reference price set in the farm bill or 85% of the five-year Olympic average farm price. An Olympic average discards the high and low values and averages the remaining observations. The ERP cannot exceed 115% of the statutory reference price. Soybeans have a statutory reference price of \$8.40 per bushel, which results in an ERP that is bounded between \$8.40 and \$9.66 for the commodity.

While PLC provides a safety net based on prices, ARC-CO provides a safety net based on revenue. A benchmark is determined by multiplying an Olympic average county yield by the Olympic average national price. The county yields are adjusted for historical trend increases, and the national prices use the ERP if it is higher than the national price in any of the five years. As a result, the ERP is used in both PLC and ARC. If the current year national price multiplied by the current year county yield is less than 86% of the benchmark, the payment rate is equal to the difference. However, the payment rate cannot exceed 10% of the benchmark. As a result, ARC-CO covers losses between 76% and 86% of the benchmark. The payment rate is multiplied by base acres and a few other factors.

Restrictions on Safety Net Effectiveness

The Title I programs contain many moving parts, but the caps in the ERP and ARC-CO limit necessary responsiveness to market conditions. The effective reference price calculation was added in the 2018 Farm Bill to provide a degree of flexibility. Prior to that, reference prices could not move, as only the statutory reference price was used. The ability of the effective price to adjust creates flexibility but is limited due to the relatively narrow range that the ERP can move.

Removing the 115% cap in the ERP calculation offers several advantages to farm policy. First, the safety net can more easily keep up with price and cost inflation, which has caused deterioration of the safety net. As detailed recently in another Economist's Angle, farm program benefits have been shrinking over the past 20 years. A substantial reason for this is that farm prices and costs have continu-

ally increased while coverage levels have largely been fixed in legislation. For instance, the statutory reference price ("target prices" before the 2014 Farm Bill) for soybeans has only increased twice in over 20 years. Since the 2002/2003 crop marketing year to the 2022/2023 marketing year, soybean market prices have increased by 157% and soybean variable costs have increased by 220%, but the reference price has only increased by 45%^[i]. The effective reference price provides a built-in inflation adjustment mechanism, as it adapts to price increases. However, the 115% cap negates much of the effect. Removing the arbitrary cap would allow programs to adapt to higher prices and farm input costs throughout the life of the new farm bill.

Another benefit of removing the cap on the ERP is that programs can better adapt to unforeseen circumstances. Farm bills are designed to provide coverage for the next five years. Forecasting market conditions five years out is difficult and full of uncertainty, which makes crafting appropriate, sufficient statutory reference prices for the farm bill's term challenging. If prices and costs increase faster than projected, the ERP allows the safety net to adapt to conditions that would have been unforeseen during the writing of the farm bill. Removing the ERP cap enables greater responsiveness and functionality of the built-in flexibility it is intended to provide.

The arbitrary cap in per-base acre ARC-CO benefits produces a different challenge than the ERP cap. It does not limit the ability of the program to adapt so much, as it prevents sufficient payments. By not covering losses greater than 24%, ARC-CO leaves a gap in the safety net when deep losses occur.

Consider the U.S.' trade war with China. In 2019, 80% of soybean



Scott Gerlt, ASA Chief Economist

base acres were in ARC-CO, while 14% were in PLC and the remainder in ARC Individual. Most soybean base acres were enrolled in ARC-CO because PLC benefits were not expected for the commodity, which proved prescient, as soybean PLC benefits were not triggered despite the trade war.

Despite the lowest national soybean yield in five years (47.4 bushels per acre) and a low marketing year average price (\$8.57 per bushel), only slightly more than half (57%) of eligible counties^[ii] triggered ARC-CO benefits (Figure 1). Of those that received ARC-CO benefits, 43% hit the 10% cap on ARC-CO amounts per base acre. In other words, nearly half of the counties that had losses beyond the initial 14% threshold had deep losses not covered by the program.

Conclusion

Both the effective reference price and ARC-CO have important mechanisms that allow them to adapt to market conditions. This helps provide benefits when needed and adapt to maintain the safety net through inflation. However, the arbitrary caps within the program limit these benefits. Removing them would allow the programs to better adapt to price inflation, respond to farmer needs and provide a more effective safety net throughout the life of the new legislation.

—Story by Scott Gerlt,
photo courtesy of ASA

Getting to Know the NDSC County Representative



Matthew Undlin
Lansford, North Dakota

Tell us about your farm.

I farm with my wife, and we've been farming for about 18 years. We farm about 3,500 acres, and we also ranch. We have five children who help out around the farm as well.

What do you like best about farming?

The freedom to be able to be around family.

Did you always know that farming was something you wanted to do?

Yes, from a young age, I've always known I wanted to farm.

Why did you get involved with the North Dakota Soybean Council as a county representative?

We raise soybeans and we sell soybean seed, so we've been a promoter of soybeans in this area for the last 20 years. The first year we raised soybeans was in 2002, which made us one of the first operations in Bottineau County to raise soybeans. They've always been part of our farm, and then when I participated on the See It Yourself tour to Portland, that sparked some interest for me in the council. The next year after the tour, I was elected to the council

as a county representative.

Why are soybeans part of your crop mix?

To break up harvest, they're a good rotation. We raise corn, canola, soybeans, and wheat, so it works good for harvest.

If you could change something about the current operating climate for North Dakota farmers, what would it be?

To reduce input costs. I've always felt that, when farm prices are good, the North Dakota economy is good. It always seems like, when we see that spike in grain prices, it's like a competition to see who can get that dollar the fastest from the farmers.

What has changed most about farming since you've been involved?

Technology in equipment. When I first started farming 20 years ago, we didn't even have autosteer. Now to think we have automatic shut off, autosteer and other tools. It takes a lot of stress out of our everyday life.

What changes do you expect to see on your farm in the next five to 10 years?

Vehicles that drive themselves will be here in the next few years. I think there will come a point where autonomous vehicles are the next step. Twenty years from now, it's hard to predict how it's

going to be, but I guarantee it's not the status quo.

What do you like to do outside farming?

I coach basketball, and my kids are involved in a lot of sports. We spend a lot of our time outside of farming, playing just about every sport you could imagine.

If you could go anywhere, where would it be?

My bucket list is Brazil. I want to visit it like a See It Yourself tour where you get to see the port, and you can meet with farmers down there. I just think it's a cool country, and it's our biggest competitor in commodities on the world stage.

What's the one piece of farm equipment or technology you wouldn't want to be without?

AutoSteer. It all comes back to that, no matter what piece of equipment you're talking about.

—Story by staff, photo courtesy of Matthew Undlin

Matthew is one of the North Dakota Soybean Council's county representatives. To learn more about serving on the North Dakota Soybean Council as a county representative or board member, please visit ndsoybean.org/council-election

—Story continued from page 15

development. Attendees also appreciated the symposium's format, which included a conversation intervention that fostered cross-discipline networking through focused, small group discussion.

Overall, the symposium not only provided an opportunity for soybean researchers to share

their work with one another and to establish meaningful connections in order to accelerate soy innovation, but the event also allowed graduate students to present their work and to connect with researchers, peers and others in the soybean community.

—Story and photos by staff

To learn more about NDSU's soybean breeding program, please visit bit.ly/NDSUsoybreeding



Getting to Know the Expert



Richard "Wade" Webster, Ph.D.
North Dakota State University (NDSU) Soybean Pathologist

Where did you grow up?

I grew up in eastern Iowa, near the town of Bettendorf. My family has a farm in Des Moines County where we raise corn, soybeans, alfalfa and about 30 head of cattle.

Tell us about your education.

My intent growing up was to be a farmer. I took every ag class I could in high school. I had the opportunity to play foot-

ball in college, so I ended up in Bozeman, Montana, playing for Montana State. There, I received a degree in crop science. I got involved with a couple of different research labs as an undergrad out there, fell in love with the research side of things, but in my heart, I knew I wanted to come back to the Midwest. I ended up getting a position at University of Wisconsin, Madison, working on soybeans and white mold specifically. I was there from 2018

to December 2022 and earned my Ph.D. I started at NDSU in January of 2023.

What led you to plant pathology?

Going into college, I wanted to be a plant breeder. I had one professor at Montana State who pushed me toward plant pathology, and it was an almost instant connection.

What is your focus at NDSU?

Everything soybean is my responsibility, but we've got a couple of other soybean pathologists here, so we work very closely. My main focus, though, is going to be on sclerotinia or white mold and then phytophthora root and stem rot, but there are many other diseases that we as a team are going to be splitting up and sharing.

What do you hope to provide to North Dakota farmers?

I want to make sure that North Dakota farmers can be sustainable in their production systems, that they can, ultimately, pass down their operations to their children or grandchildren and be in a better place than when they started. I want to make sure that people are able to have their farms improve, that they can manage

disease appropriately and make sure that farmers know what information is out there and that they have good information.

What's most rewarding about what you do?

Something that I focus on a lot is predictive modeling predictive tools. At the University of Wisconsin, I helped refine a tool called Sporecaster, which is a soybean white mold forecaster app, which we've seen have really great impacts across the Midwest. It helps farmers predict when the disease might be developing, and it helps recommend when to make fungicide applications. The fact that we can manipulate these mathematical equations and actually translate that into real-world applications is what it's all about. Being able to see the translational work and effort that we put in and it benefits farmers is the most rewarding part.

What do you like to do away from work?

I'm a huge fisherman. My wife and I have a dog who keeps us pretty busy. I like to be outdoors and garden. I'm also big into collecting insects, which is quite fun to do in the summer.

—Story by Daniel Lemke,
photo by staff

Bean Briefs

WOTUS Veto Stands

The U. S. House of Representatives fell short of overriding U.S. President Biden's veto of joint resolutions of disapproval to void the administration's Waters of the U.S. (WOTUS) rule.

With widespread, bipartisan pushback from Congress, states, and ag groups, lawmakers say they will continue working "to overturn

this incredibly intrusive regulatory expansion."

While the new WOTUS rule went into effect in 48 states on March 20, ag groups and coalitions are taking legal action to prohibit its enforcement. Preliminary injunctions have been granted by federal judges to 26 states, temporarily blocking implementation of the

revised WOTUS rule.

The American Soybean Association (ASA) continues to voice strong disagreement with Environmental Protection Agency's (EPA) assessment that the new rule is a more moderate take on WOTUS that will be better for farmers and the agriculture industry, specifically expressing concerns with a confusing two-part

identification standard; how implementation of the "significant nexus" standards will deem waters and wetlands upstream of a project area jurisdictional; and excessive property rights restrictions. ASA appreciates Congress sending a strong bipartisan message to EPA and the Army

—Story continued on page 29

—*Story continued from page 18*

Corps that the new WOTUS rule is unworkable.

The U.S. Supreme Court is expected to release an opinion on a WOTUS case (*Sackett v. EPA*) very soon, which may require a rewrite of significant portions of the rule—an action that now has bipartisan congressional support.

EPA Proposes New Emission Standards

The Environmental Protection Agency (EPA) has released two proposed rules to update tailpipe emission standards for cars and trucks. Paired together, the two proposals mark the most aggressive climate regulations that the Biden administration has released to date. The American Soybean Association (ASA) is tracking these developments and analyzing how this change could affect agriculture.

Emission standards for light- and medium-duty vehicles for model years 2027 and later proposed by the EPA include updating tailpipe emission standards that would result in a 56% reduction in greenhouse gas emissions for light-duty vehicles by model year (MY) 2032, using the existing MY 2026 standards as a baseline. For medium-duty vehicles, the target is a 44% reduction using the same model years.

It is important to note that these reductions will be measured by an across-fleet average, meaning that an automobile manufacturer can utilize a variety of technologies across models to achieve the target. Even though these standards are technology-neutral, automobile manufacturers will, realistically, need to produce significantly more electric vehicles (EVs) to reduce the fleet-average emissions in order to comply with the proposal.

Based on an early analysis of the proposed rule, it is likely that, if the change is finalized, it would result in 64-67% of all new car sales in MY

2032 being EVs. For comparison, only 7% of new car sales in MY 2022 were EVs. There are major concerns about the country's ability to develop batteries, to acquire minerals for those batteries and to produce enough low carbon electricity to power so many EVs.

The emission standards proposed for heavy-duty vehicles would result in downstream carbon dioxide emission reductions of 30% by calendar year 2055. Unlike the light- and medium-duty rule, heavy-duty vehicles are grouped into different categories and are given different emission targets. The proposed rule would amend emission targets for MY 2027.

The heavy-duty rule would, again, be technology neutral and would need to include several technologies: the EPA specifically called out bio-diesel and renewable diesel as being included with that mix. However, the EPA anticipates that the volume of fully electric heavy-duty vehicles would need to increase significantly as part of this proposal.

ASA Supports Sulfoxaflor Registration

In comments submitted to the Environmental Protection Agency (EPA), the American Soybean Association (ASA) has expressed strong support of the EPA's decision to register sulfoxaflor for use on soybeans.

The comments highlight the importance of crop protection tool availability to allow ag producers to continue the safe, affordable and sustainable production of food. "Having a broad array of tools and the guidance to use them safely will significantly contribute to our need to sustainably feed 9.7 billion people by 2050," the ASA states.

Generally, insect pests inflict more than \$283 million in yield losses to the domestic soybean industry annually. These losses would be much higher without access to sulfoxaflor

and other effective insecticides.

Soybean aphids and stink bugs—both insects for which sulfoxaflor is registered for use with soybeans—are significantly damaging for producers. If left unchecked, both soybean aphids and stink bugs can inflict yield losses up to 40%. It is estimated that, each year, these two pests inflict more than \$191 million of damage to yield losses for U.S. producers.

The ASA also underscores the critical need for growers to access newer tools, such as sulfoxaflor, to manage insect resistance to other pesticides.

ASA Submits Comments Supporting Insecticide Use

The American Soybean Association (ASA) has submitted comments to the Environmental Protection Agency (EPA) on a draft for the Endangered Species Act (ESA) regarding a biological evaluation for the insecticidal active ingredient cyantraniliprole. While the active ingredient has been registered for agricultural uses since 2014, both foliar and seed treatment uses with soybeans are relatively new and have only been available since late 2018. In November 2022, the EPA was directed, as part of a court order, to conduct an ESA assessment for cyantraniliprole.

In the comments, the ASA established the important benefits and uses of cyantraniliprole, including managing noxious insect pests such as corn earworm, soybean aphids, green cloverworms, velvetbean caterpillars and several other species. Access to tools like cyantraniliprole is important to prevent hundreds of millions to billions of dollars in damage for soybean farmers annually. Additionally, the ASA commented about how cyantraniliprole's unique group 28 mode of action (MOA) will allow greater tank mix capability to minimize pest resistance pressures. Because the product is relatively new, the

current market use on soybean acres is relatively small, although the ASA expects the acres under use to increase significantly in the coming years.

Commodity Classic Sets Record

In March, more than 10,400 attendees from all walks of agriculture gathered in Orlando for the 2023 Commodity Classic. The 2023 event broke the previous Commodity Classic record of 9,770 attendees for the 2016 convention which was held in New Orleans.

The Commodity Classic features a trade show, educational sessions, banquets and annual delegate sessions for national agriculture groups, including the American Soybean Association.

Ag Groups Want Congress' Hands Off Checkoffs

The American Soybean Association (ASA) and other major ag associations have submitted comments to lawmakers opposing the Opportunities for Fairness in Farming (OFF) Act while supporting the numerous benefits checkoffs provide to farmers. The OFF Act seeks, among other things, to prohibit checkoffs from contracting with an organization that engages in lobbying, conflicts of interest, or anticompetitive activities that harm other commodities.

The groups maintain the OFF Act, "would set producers back decades in the work which has been done to promote our commodities and improve the businesses and livelihoods of our members."

For every dollar farmers invest in the soy checkoff, they receive a \$12.34 return on investment through the results of the United Soybean Board's promotion, research and education.

—*Story by Daniel Lemke*

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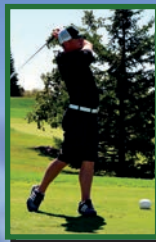
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