MARCH 2023

# Illinois Field & Bean

A PUBLICATION OF THE ILLINOIS SOYBEAN ASSOCIATION

## The Front Lines of Advanced Agriculture: The Research Issue


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## DEPARTMENTS



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**COVER:** Inside this issue, Illinois Field & Bean highlights the collaborative research projects ISA conducts in an effort to leverage data, respond to global need, and provide the most hopeful return for Illinois soybean farmers.

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# Putting Research to Work for Us

In order to solve today's problems, anticipate tomorrow's challenges, and continue to drive our industry forward, we rely on agronomic research. As Illinois continues to lead the nation in soybean production, the Illinois Soybean Association (ISA) utilizes research to not only help increase yields, but long-term farmer profitability as well.

ISA works both in and out of the field to find new uses for soy, pinpoint leading conservation practices, and identify best management practices for soybean producers in the state of Illinois. From case studies and field trials to investing in a variety of research projects, ISA provides a number of research findings across several platforms.

Outside of funding in-state research, ISA collaborates with the North Central Soybean Research Program (NCSRP), a farmer-led organization that represents more than 355,000 soybean farmers across 13 states. This joint effort allows ISA to participate in multi-state research projects which creates a larger pool of funds available for collaborative research throughout the Midwest. To learn more about NCSRP, go to their website at ***www.ncsrp.com***.

Along with funding research and working with outside organizations, the ISA Utilization Committee focuses on solving a variety of issues in our industry and works to better understand the science behind producing soybeans. To see the several different case studies and efforts from the Utilization Committee, like "Understanding the Importance of Cover Crop Planting Date" and "Advanced Soil Health Training," go to ***www.ilsoy.org/focus-areas/utilization/***.

ILSoyAdvisor, a program funded by the ISA checkoff program, is another great resource for agronomic and management advice on producing soybeans in Illinois. I encourage you to explore the ILSoyAdvisor website, ***www.ilsoyadvisor.com***, to get the latest in soybean education, resources, research, webinars, and success stories.

Science and technology are constantly evolving, and for soybean farmers to maintain a competitive advantage, preparation is key. The research discoveries happening within our industry today will easily reshape the future of farming. To keep up with our ever-changing industry, the ISA checkoff program has SoyInnovator, which works to "inspire a future-ready position" by providing soybean farmers and industry partners with science-based news to inspire continuous improvement on Illinois soybean farms through the adoption of new practices and technology. To stay up to date on the latest updates from SoyInnovator, go to ***www.ilsoyinnovator.org***.

The future of Illinois soybeans is bright, and with our mission to enable Illinois soybean farmers to be known as the most knowledgeable and profitable producers in the world, investments in research will see that mission is met with success.

# Team Spirit

JOHN LUMPE | CEO |
ILLINOIS SOYBEAN ASSOCIATION

Do you know the "We're #1" foam fingers you see at major sporting events?

Well, that's me these days when I travel around Illinois working on behalf of the soybean industry. There's nothing more I want to do than shout the good work of Illinois soybean farmers – the #1 soybean producing farmers in the nation.

In 2022, Illinois farmers raised 677.25 million bushels of soybeans on 10.75 million harvest acres with an average yield of 63 bushels per acre. If that doesn't deserve a flailing foam finger celebration, I don't know what does. In fact, maybe we'll do just that at Farm Progress Show 2023.

And while it takes a number of advantages to come together each year – great farmers, rich soil, and an ideal growing season to name a few - another contributing factor to Illinois soybean success is the checkoff's investments in research to maximize the yield and efficiency of your soybean acres.

In the past, we've published an annual research report, and this year we've devoted an entire issue of Illinois Field & Bean to the topic. In these pages, you'll read about a number of exciting research developments happening in and around ISA. We'll introduce you to university researchers, soy state collaboratives, and even new soy use developments happening at Airable Labs in my home state of Ohio. This issue details the diversity of checkoff-funded research initiatives currently happening at ISA.

This winter we've been developing our new strategic plan, a common and healthy practice for any organization to do every few years. We revised our mission statement to read: "The Illinois Soybean Association upholds the interest of Illinois soybean producers through promotion, advocacy, *research,* and education."

Research will remain a growing priority within our organization, and an investment that we know is critical to ensuring profitability on-farm now and for future generations. This magazine issue devoted to research is far from the last word on the topic.

In the true nature of team spirit, I hope you recognize that we're all in this together. I'd love to hear from Illinois farmers on what research investments you'd like to see us make, and you can email our team today at ***ilsoy@ilsoy.org***. Farmer feedback is key to making our checkoff investments work smarter, and harder.

Funded by the Illinois Soybean Checkoff

# At Work, In the Field, For You: Meet ISA's Collaborative Researchers

*By Claire Weinzierl*

Research is key when it comes to maximizing yield for soybeans, and ultimately, maximizing your profitability. The Illinois Soybean Association (ISA) puts considerable thought into which research projects we invest your checkoff dollars into and the researchers behind them. The researchers behind your checkoff-funded projects work year-round to bring you the latest in soybean agronomy, and we'd like to introduce you to a few of them.

**Nathan Johanning, M.S.**
*Nathan Johanning is an Extension Educator in Commercial Agriculture for the University of Illinois.*

**Areas of Expertise**
*Cover crops*
*Weed management*
*Soil fertility*
*Soil conservation*
*General agronomy*

Johanning is embedded in the southern Illinois agriculture scene. He earned his bachelor's and master's degrees in Plant and Soil Science from SIUC. As a researcher and instructor at SIUC, he managed field research in general agronomy, weed science, and specialty crop production, as well as taught various agronomy and weed, soil and plant science classes. He sees soybeans as being an adaptable crop with many opportunities to further enhance the region's production systems.

In his current role as a commercial agriculture educator, Johanning works with farmers in the St. Louis Metro-East counties to understand and research solutions to their production challenges. He conducts research on a local farm and at the SIU Belleville Research Center.

Johanning leads the checkoff-funded project, "Understanding the Importance of Cover Crop Planting Date in Illinois Row Crop Production." Cover crops are an important tool in preserving and increasing soil productivity, stewarding water resources, suppressing weeds, and retaining nutrients. However, planting cover crops coincides with the busy harvest season. The results of this research will assess optimal planting windows, seeding rates, and termination timing to maximize overwintering, biomass production, and rotational crop stand, growth, and yield.

**Dr. Shalamar Armstrong**
*Dr. Shalamar Armstrong is the Associate Professor of Agronomy and Soil Conservation at Purdue University.*

**Areas of Expertise**
*Soil, water, and nutrient conservation*
*Water quality*
*Cover crops*
*Regenerative cropping systems*

Armstrong is deeply-rooted in the many aspects of soil science and is regarded as an expert in regenerative agricultural systems, cover crop technology and nutrient cycling. From his post-doctoral days with the USDA-ARS National Soil Erosion Research Laboratory, to his current role directing Purdue University's Soil Ecosystem and Nutrient Dynamics lab, Armstrong leads and supports research initiatives to help farmers better understand and nurture the dynamic soil ecosystem to improve the productivity of their crops. His work earned him the distinction of being the first native African American to be awarded tenure in the Agronomy Department at Purdue University.

He sees focusing on soybean research as a key to advancing regenerative farming. Soybean fields account for a significant portion of infield conservation practices such as reduced tillage and cover crops. A native of Louisiana, Armstrong also draws from his experience in sugarcane and cotton.

Along with associates Dr. Giovani Preza-Fontes from the University of Illinois and Dr. Shaun Casteel from Purdue University, Armstrong leads the FY23-funded project, "Adaptive Management for Maximizing Soybean Production Following Cereal Rye Termination." This project addresses the questions of how cereal rye influences soil nitrogen and sulfur availability and uptake by soybean after termination, and whether supplemental nitrogen and sulfur impact soybean yield response.

The overall goal of this research is for researchers to gain a better understanding of the situations that could impede soybean development and yield following cereal rye and develop adaptive management to mitigate nitrogen and sulfur deficiencies. Thus, farmers will have access to management strategies to maintain or improve soybean yield and quality when coupled with cereal rye.

**Dr. Jason Bond**
*Dr. Jason Bond is a Professor of Plant Pathology at Southern Illinois University (SIU).*

**Areas of Expertise**
*Plant pathology and plant health*
*Fungi and nematodes*

Bond was born into a love of agriculture, working in crops since he was big enough to hold a hoe. A second-generation plant pathologist, he spent his time as an undergraduate at Southeastern Louisiana University working in a microbiology prep room and on his dad's vegetable farm. He earned his doctoral degree in plant health from Louisiana State University (LSU) and then moved to Illinois where he started as a post-doctoral researcher at SIU.

Currently, Bond divides his time at SIU between research, teaching, and service appointments. The Director of the Illinois Soybean Center at SIU Carbondale, Bond's research and teaching program focuses on disease management in Midwestern row crops. He also serves as the advisor for the Agronomy Society, which provides leadership and professional development opportunities for undergraduate and graduate students.

Bond leads several projects for ISA including, "Using Multispectral Platforms to Manage the Soybean Cyst Nematode," "Assessing the Impact of Cover Crops on SCN Populations in Field Conditions," and "Soybean Stem Pests: Survey, Impact and Education."

These research projects aim to provide farmers with a more clear and more specific view of SCN population levels, activity and density across their fields, allowing them to be more precise in their management of SCN. Farmers who experience heavy or difficult-to-manage SCN populations can incorporate cover crops in their management practices. This research also hopes to identify which soil microbes are linked to SCN suppression as another management option.

The stem pests project will inform farmers of the most prevalent pathogens and pests impacting soybean production fields across Illinois. It will also identify potential environmental and geographic factors that affect their incidence and distribution. By better understanding these pathogens and pests, agronomic consultants can help farmers identify management practices that may minimize their impact on yield.

**Dr. Andrew Margenot**
*Dr. Andrew Margenot is an Assistant Professor at the University of Illinois Urbana-Champaign.*

**Areas of Expertise**
*Soil conservation*
*Soil fertility*
*Nutrient cycling*
*Soil health*
*Nutrient loss reduction*

Margenot took what he learned earning his doctoral degree at the University of California Davis to East Africa and Columbia where he focused on soil fertility in grain cropping systems. He also spent time researching soil fertility in horticultural crops in California. Since 2017, he's been investigating nutrient management and loss mitigation in Illinois corn-soybean systems.

Margenot believes soybeans have the potential to lead the way in conservation across the Illinois and larger Corn-Soybean Belt cropping systems. It's this belief that fuels his current roles. He runs the Soils Lab at the University of Illinois where he leads a team of over 30 researchers, graduate students, and technicians. A proponent of "knowledge is power," he teaches organic chemistry, soil fertility, and the agriculture and science of coffee to undergrad and grad students in the Department of Crop Sciences and the greater campus. In addition, Margenot serves as the technical lead on soil health methods for USDA-NRCS and as Associate Director of the Agroecosystem Sustainability Center at the University of Illinois.

When it comes to checkoff-funded projects, Margenot leads, "Benchmarking and Integrating Soil Health, Water Quality, and Climate-Smart Footprints of Illinois Soybeans." While farmers are curious about soil health, sustainability practices and carbon credit markets, they are also skeptical in part because of the lack of metrics and data. Because of the various cropping systems and growing environments in Illinois, farmers demand more than generalizations.

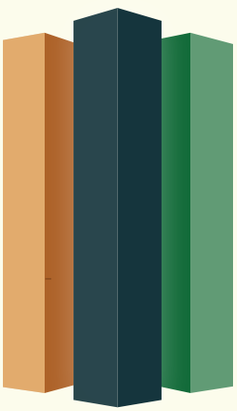
This research project is designed to deliver hard, field-based data farmers can use to inform management decisions to achieve different outcomes. Farmers will have a clearer view of how tillage and cover cropping practices interact across the different soil and climate regions of Illinois. This will provide insights into the potential trade-offs between soil health and yield based on tillage and cover crop practices, as well as understanding when it makes economic sense to take advantage of carbon credit programs.

Through the ILSoyAdvisor platform, ISA has launched a new research hub where Illinois soybean farmers can explore and learn more about checkoff-funded research and the experts behind it. For more information about these projects and researchers, visit ***www.ilsoyadvisor.com/learn.***

# Make Moves with U.S. Soy

Our founding farmers took action **22 years ago** to launch ASA's World Initiative for Soy in Human Health so WISHH could grow new markets for U.S. Soy. Today, WISHH is working with strategic partners that use soy for food or feed in **28 countries** across Asia and Latin America to sub-Saharan Africa.

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



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# Something's Emerging

ANDREW LARSON | DIRECTOR OF GOVERNMENT RELATIONS & STRATEGY | ILLINOIS SOYBEAN ASSOCIATION

As we all look forward to the end of winter and the emergence of spring, something else is also emerging at the Illinois Soybean Association (ISA). For many years ISA and Illinois Soybean Growers (ISG) have maintained a small, internal team tasked with tracking and monitoring issues, and engaging on behalf of ISG members in Springfield and Washington, D.C. This team has been limited to one or two members... until now. The newly-formed, eight-member Government Relations team at ISA is focused on building critical relationships through outreach, policy expertise on key issues impacting farmers, and engaging ISG politically via our political action committee, ISGPAC.

Cultivating relationships with Illinois legislators, and educating them about issues most prevalent for Illinois farmers, is a crucial building block for this strategy. By leveraging the Chicagoland ISA Lombard office, a location that was chosen for its close proximity to over 100 legislators representing largely-populated areas with very little agriculture, our new Lombard-based Outreach Specialist is sharing the story of Illinois soy with our northern policy-makers. Of course, no one tells the story of farming better than farmers, so our two new Bloomington-based Outreach Coordinators will work to share this story and connect legislators directly with Illinois farmers.

Good policy is the backbone of good legislative and regulatory outcomes. The team at ISA is also expanding with two new Public Policy Managers based out of the Bloomington office. This team will be working to dive deeper with farmers and legislators about policy that makes an impact on the farm as well as on soybean markets. One area of note centers around the increasing amount of attention that climate smart agriculture is receiving. Increasingly, farmers are being considered for the role they play in helping meet climate and sustainability goals. One of the new team members is focused on working to understand this role and make sure any impacts on farmers work for their farms and don't impede freedom to operate.

The third area of emergence is in the political process. Often agriculture is dwarfed in political calculations in Springfield because of the urban vs. rural spread of the General Assembly. Being active politically and the growth of the ISGPAC is a vital tool for ISG to share its message with Illinois legislators and pass legislation that helps farmers. ISG has grown its team to employ an Engagement Manager who works on growing the presence of ISGPAC and ISA with legislators.

Last year, ISG was able to pass an extension of the state policy that incentivizes the use of biodiesel blends from B11 to B19. This extension creates demand for soybean oil from 100 million bushels of soy. This effort reinforces that a solid model, built on outreach, policy, and political engagement, will support the sustainable emergence of agriculture in government relations across Illinois. As the leader of this emerging team, I am excited for the opportunity to keep working for Illinois soybean farmers and achieve positive legislative and regulatory outcomes.

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JOHN DEERE

# Get Back At It

RACHEL PEABODY | EDITOR |
ILLINOIS SOYBEAN ASSOCIATION

The word "research" is interesting. It implies the search for something or an investigation that entails gathering facts and clues to help draw a specific conclusion. And "re" is a prefix that can imply careful intensity, or it can indicate repetition. It means to get back at it, with care.

And doesn't that just sum up our work as a checkoff program?

I love the idea that across our organization – across agronomy, market development, and government relations – we don't stop after our first try. Or even after our second or third try. We get back at it, again and again, to reexamine where we've experienced success, where we've been challenged, and where new opportunities lie in wait. Our credibility, and our sustainability, depend on us being able to replicate our wins year after year.

So we get back at it.

We get back at it because conditions change. The environment changes. The economy changes. And we want to be sure that the information we're sharing with our farmer audiences is the most relevant, the most accurate, and the most helpful.

Over these pages, we invite you to roll up your sleeves, step into your work boots, and join us in the field as we explore new agronomic frontiers through research, science and technology. You'll read about adapting our global impact, using less to generate more, and how ISA's checkoff-funded research is shaping the future of farming. You'll meet the researchers from around the state who are bringing new agronomic topics, threats, and opportunities into focus.

You'll enjoy hearing from Jack Marck from the University of Illinois and his perspectives on young ag leaders, ag tech trends influencing the industry, and his down-to-earth approach to developing new technologies, agronomic startups and programs that don't take time from busy farmers' schedules.

And you'll learn about the research projects ISA conducts in partnership with university teams in an effort to leverage data, respond to global needs, and provide the most hopeful return for Illinois soybean farmers.

So for the next few minutes, let's indulge our curiosity, ask scientific questions, and immerse ourselves in all-things research. Let's open our minds to new ways of thinking about our industry and work.

And then let's get back at it.

ILLINOIS FARMERS

TOP 20 UNDER 40

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2023

# Give Us Your Best

Young farmers are our future, and no state's future in agriculture is brighter than that of Illinois. Leading the nation as **#1 in soybean production** and **Top 10 in agriculture** as a whole, Illinois is brimming with farmers of all specialties who truly operate in a league all their own.

★ ★ ★

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Funded by the Illinois Soybean Association Checkoff Program.

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**NOMINATION DEADLINE**

**March 31, 2023**


Airable Research Lab has developed a number of soy-based product alternatives, including DeWalt Bar and Chain Oil, the first bar and chain oil to be USDA certified and biodegradable.

# Accelerating Soy-based Product Commercialization

*By Olivia Key*

Airable Research Lab, a business line of the Ohio Soybean Council, works with companies to not only create new soy-based products but also to improve existing products using soy. The lab, located in Delaware, Ohio, is the first of its kind, as they solely focus on developing new uses for one raw material, soybeans.

Barry McGraw, the founder and CLO of Airable Research Lab, says, "The Ohio Soybean Council has invested in new uses and bio-based products for a long time." For example, the Council helped to develop Roof Maxx™, an environmentally-friendly, cost-effective alternative to roof replacement.

"However, the Council focuses on funding research and development organizations, such as universities, rather than commercial companies. The research doesn't get done quickly enough; the products then need to find their way to commercial applications, and nobody is focused on the Council mission— soybean consumption. Airable's goal is to fill that gap," says McGraw. The Airable team strives to get the products their clients want or need on the market efficiently.

"We work directly with commercial and bio-based companies to help them develop soy-based products. If the work is successful, we would potentially file a patent for the technology and license it to the commercial partner for production and commercialization," he adds.

Airable has developed a number of soy-based products in the lab. For example, they partnered with Black & Decker to create DeWalt Bar and Chain Oil, the first bar and chain oil in North America to be USDA certified and biodegradable.

Although Airable seeks out commercial partners, Airable staff also contribute to product commercialization. For instance, the lab has an ongoing relationship with the Roof Maxx company to help grow the soy-based roof treatment's market presence. The company now makes over $7 million in annual revenue, with

over 50 million square feet of soy-based roof treatment already applied—equivalent to 40,000 pounds of soybean oil.

To test and develop these diverse soy-based products, the Airable lab is equipped with a range of synthesis, formulation, and analytical capabilities.

"Synthesis is essentially changing the structure of a material, like cooking. It can involve heat and some catalysts or reactions that will convert the soybean oil into a different molecule or material," says McGraw.

As for formulation, the lab has mixing equipment that can handle various levels of viscosity and particle sizes to ensure the necessary product performance is met. McGraw says, "It would be like purchasing three or four different raw materials and mixing them together in a certain order at a certain ratio, and that would be a formulation."

Finally, analytical capabilities are used for testing final products. "We have to do some testing to determine whether we did what we thought we would do—because you can't just see whether it's working—and we use these capabilities to ensure we created the molecule we intended to make," McGraw says.

So, what makes soy such a versatile product alternative? "The functionality and the chemistry of it," says McGraw. "It's very comparable. You can replace a lot of petroleum-type oil products, and it ultimately makes a stronger material, whether it's like a coating for a gymnasium floor, a polyurethane that you coat a wood floor with, or a primer that you would use on your walls before applying a topcoat," he adds.

Finding and creating new uses for soybeans not only will increase sustainability practices and the use of renewable resources across the nation—it also benefits soybean farmers in a variety of ways. "Not every soy-based product will equate to thousands of acres of farmland, but we're constantly developing new products. So, when you start to look at hundreds and thousands of different soy-based products, it starts adding up. It creates diversity in the demand for the soybean farmer's products, which helps keep prices high, whether it's biodiesel or other soy-based alternatives," says McGraw.

The benefits don't stop there. Airable also helps commercial companies to develop products specific to consumer needs, as well as helping them to keep up with the rising demand for more sustainable products. McGraw says, "We tend to help small to midsize companies that don't necessarily have a research team or chemists to do what they need to do, or just don't have the time. Or they don't have a background in bio-based materials or chemistry at all, so we bring that expertise."

Prior to the creation of Airable Research Lab, McGraw served as Director of Product Development and Commercialization for the Ohio Soybean Council, and he started his career at Battelle, a non-profit research organization that focuses on conducting research to provide independent and advanced solutions in hopes of changing our world for the better. His inspiration was sparked by the fact that the process of finding new uses for soybeans was inherently slow and often frustrating. McGraw says, "The checkoff has funded other groups to develop soy-based products, but the primary objective of companies and universities is to create demand. Our number one objective is to develop those products to create demand for soybeans, and it's difficult to find anyone else with that same objective."

To learn more about Airable Research Lab, visit their website at ***www.airableresearchlab.com.***

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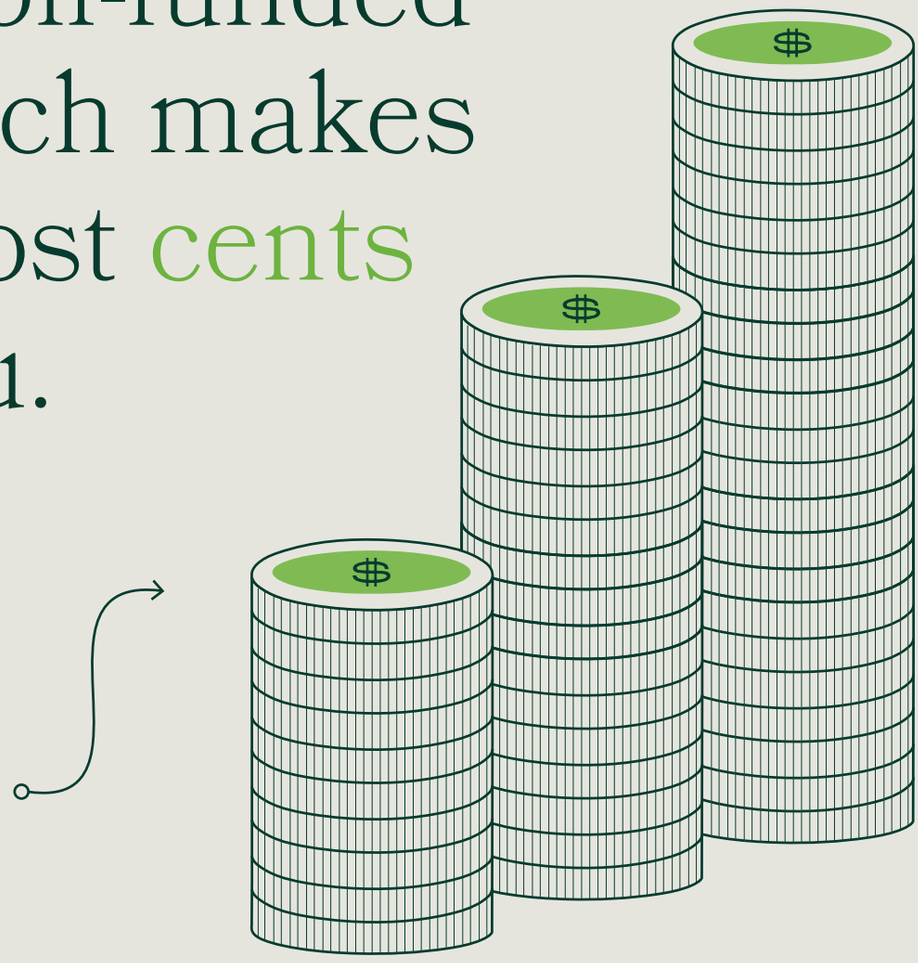


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# Hitting the Marck

*By Betsy Osman*

Illinois' AgTech Accelerator is a fascinating ecosystem that weaves together science, research, engineering, resources, and talent. An innovation hub styled for technological advancement, this home for disruptive technologies is doing more than creating insular silos for research and development, housing entrepreneurial ventures and corporate partnerships, and tinkering with prototypes. The AgTech team is creating innovative models for identifying novel problems and solutions by aligning themselves with companies dedicated to value-added farming technologies and then handing off those new technologies to those who will apply them for real world application.

You.

At the helm of this collaborative collision sits Jack Marck, Managing Director of AgTech Accelerator. "We have incredible resources here in the agtech space," says Marck. "We have a close relationship with the University of Illinois, which is top-ranked nationally in both Computer Science and Agriculture. We also partner with other investors who appreciate the importance of investing in early-stage agtech companies."

According to Marck, successful agtech innovators must be able to answer the two questions farmers have where new technology is concerned: Will this adoption add to my already-full workload? Will this

Jack Marck, Managing Director of the Illinois AgTech Accelerator, is on a mission to create smart agriculture data standards for better productivity outcomes.

adoption increase my profitability?

And though there are numerous technologies currently in development, according to Marck the greatest return on investment will come from technologies that can benefit commercial agriculture and operate at scale.

"What I get excited about are the ideas and innovations that make farmers' lives easier and better, whether that means a reduction in workload or an increase in profitability," says Marck. "The American Farmer is pinched in profit and overworked. There is a lot of opportunity to help alleviate pain-points and put more money in farmers' pockets. In the end, that's what technology is all about."

Recently, Marck has begun working with IEEE Standard Association in an effort to create new systems for establishing ag data standards and sharing that data across industry stakeholders. With this information, the group hopes to increase collaboration around ag data collection, security, and management.

"We've identified a struggle that exists across the agricultural sector due to a lack of standards," says Marck. "With no common understanding of how to represent on-farm practices, new solutions often require farmers to enter their historical data multiple times. I'm excited about what we could accomplish to help simplify, standardize and secure on-farm data. The industry needs this badly and the longer we go without data standards in ag, the worse the problem becomes. I'm glad we've started this conversation; it feels good to be part of the solution."

The group works with innovative technologies such as blockchain-based supply chain management solutions, AI-based digital agronomy, autonomous and semiautonomous machines, and IoT/remote sensing solutions which have created an overwhelming amount of information.

"We believe that understanding agricultural supply chain data needs will benefit both small producers and large operations, related suppliers, including hardware and software vendors, as well as academic researchers and data standards developers," says Marck. "We want to simplify data management for our growers so that they can more easily benefit from digital agronomy tools and the growing opportunities to monetize their data through partnerships across the supply chain."

ILLINOIS AGTECH Accelerator

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What makes Marck unique from other idea-architects is that, rather than using his resources to stack one radical iteration on top of the next in an effort to dazzle funders, his feet are planted firmly on the ground as he takes aim at the challenges that keep farmers up at night. "The thing is, Illinois growers don't get longer days because they decide to adopt new technologies. That's something we always come back to when we're developing a new product or company. For farmers, adding a new process means letting go of an old one; something that wasn't providing enough return on investment. That's not always an easy or obvious choice. Farmers are incredibly busy, and the stakes are high."

Marck is as unintimidated by an ever-shifting creative landscape as he is optimistic about the future of Illinois agriculture. "Illinois is home to some of the best soil, smartest researchers, and hardest working farmers. If this isn't a winning combination, I'm not sure what is."

He laughs and adds, "Now, if we can just get the weather to cooperate."

Jack Marck and wife, Wendy, have four sons: William (8 y), Robert (5 y), Edward "Teddy" (3 y), and Stewart (1 y).

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ISA Outreach Agronomist Stephanie Porter and Agronomy Programs Manager Megan Miller inspect the roots and stand of a successful cover crop field.

# Leveling Up

*By DeAnna Thomas*

What if you could bring the best and brightest minds in the soybean industry together to help answer farmers' questions and solve farmers' problems?

"That's exactly what the U.S. Soybean Research Collaborative (USSRC) Soybean Research Forum and Think Tank is," said Megan Miller, Agronomy Programs Manager for the Illinois Soybean Association (ISA). "It's a meeting of the minds passionate about serving soybean farmers and helping them be successful."

The 2022 Think Tank event, hosted in Indianapolis July 18-22, 2022, involved various participants including researchers, farmers, sustainability experts, food company executives, and industry partners.

"The event challenged participants to think and discuss how the research community could drive the industry forward and help soybean farmers thrive in the face of new challenges and opportunities," Miller said.

The theme of the 2022 Think Tank was "Moving from Opportunities to Innovation," and the key goal was to examine soybean research opportunities and solutions that span the value chain – breaking down some of the traditional bins and silos between "production research" and "new uses research."

"We had the opportunity to hear from industry experts to learn about emerging markets and new opportunities for soybean farmers," Miller said. "Then, we learned about the new and exciting research being conducted to meet these opportunities."

This year's Think Tank, partially sponsored by the United Soybean Board (USB), focused on four specific areas: aquaculture, renewable diesel, plant protein and technology. These topics were chosen because they represent segments of the feed, fuel, or food markets for soy and they can serve as model systems, helping researchers think differently to help drive value in the future.

"While these four emerging markets were the focus this year, it doesn't mean we should we neglect more traditional markets or limit ourselves to these areas," Miller added.

The primary goal was to identify each topic's trends, challenges and opportunities. From there, actionable items were formed to create oppor-

tunities and specific strategies the USSRC can explore with other groups as prospects for future research. Below is the summary of methods captured by Miller and other think tank participants on bridging the gap between supply and demand.

### Think Tank Action Items: Aquaculture

The tactics identified to support the aquaculture industry include:

- Ensuring certification protocols meet aquaculture requirements;
- Increasing demand from aquaculture (education among consumers);
- Building infrastructure to support opportunities; and
- Integrating teams to include representatives across the value chain to deliver on the needs of a growing industry.

### Renewable Diesel

The strategies identified in renewable diesel include:

- Altering soy profile to optimize for the fuel market;
- Building infrastructure and logistics to support value-added opportunities;
- Increasing demand to compete against electric vehicles;
- Continuing to build on the soy sustainability story; and
- Finding uses for soybean meal and processing byproducts.

### Plant Protein

The following steps in plant protein include:

- Improving the taste, texture and allergenicity of soy foods;
- Selling the benefits of soy foods to increase demand;
- Building infrastructure to support processing opportunities; and
- Taking a whole farm approach to increase soybean yields and profitability.

### Technology

In the area of technology, some of the common goals identified included:

- Building training and mentoring programs to increase the adoption of new technologies;
- Connecting innovators to farmers;
- Exploring the role of commodity groups in vetting technology; and
- Demonstrating the benefits of ag tech to consumers with data.

### Common Strategies

Common strategies identified for all areas included building research teams that have representatives across the value chain to ensure farmers are delivering for the end users; exploring building infrastructure to support; identifying and preserving traceability within the supply chain; using data to demonstrate the carbon intensity and sustainability metrics of soybean production; and developing platforms that allow innovators to connect with the farmer to bridge the gap between research and the farm.

"We have exciting research in our pipeline for 2023 and the coming years as a result of the future-forward strategies that were born from the Think Tank," Miller said. "It's gratifying to be a part of the research that will enable Illinois farmers to 'level up' their soybean production practices."

The third annual USRC Think Tank will be held summer of 2023. If interested in participating, contact Megan Miller at ***megan.miller@ilsoy.org***.

### About USSRC

Directed by Dr. Katherine Drake Stowe, USSRC is a multistate soybean research initiative dedicated to more effective coordination and collaboration among all industry sectors for farmers' benefit. The collaborative, funded by multiple states and national soybean organizations, including Qualified State Soybean Boards, that initiates and sustains greater connectivity between agronomic soybean research and all facets of the U.S. soy supply chain.

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The Illinois Soybean Association (ISA) recruits the top researchers in soybean agronomy, collaborating on innovative research that will enable Illinois soybean farmers to be the most knowledgeable and profitable soybean producers in the world.

Researchers work year-round to dig in and discover the best ways to address the opportunities of growing soybeans including:

- Agronomic practices including pest, weed, disease, and nutrient management
- Projects combining high–yield with soil–health practices
- Conservation initiatives, including water quality, soil health, best management practices, and agronomic production in a sustainable system


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ILLINOIS SOYBEAN ASSOCIATION

# Soy Story with Ken Dalenberg

**Meet the self-proclaimed "Old School, Precision Ag Farmer" who's paved the way of the future, not by innovative technologies, but by innovating relationships.**

*By Betsy Osman*

Before the iPhone, before the internet, before the social media age, there was human calculation. There was intentional communication. And there was the ability to turn the world on, and then turn it off again. There were no battery-powered wireless chargers, no mainstream conference calls, and little need for noise-canceling headphones.

No purring, no whirring; no updates and downloads.

It's hard to remember a time we weren't pocketable society. But if you ask Ken Dalenberg – one of the most innovation-forward figures in the global farming community - what he values most about today's high-tech agriculture scene, he will laugh and tell you "absolutely everything."

Ken grew up in Southern Illinois on a dairy farm. His parents were first-generation farmers, and it was their weary influence that taught Ken three things about farm life: that hard work is the necessary crux of any job well done, that he didn't want to milk cows for the rest of his life, and that he intended to upend the old traditions of data collection, make analytical research accessible, and electrify communication.

Ken studied crop sciences at the University of Illinois where his professors inspired his eagerness to learn more about biotechnology and pathology disease. He eventually earned his master's degree, and with the advent of the internet and email, became involved with a group at the university that was focused on wielding cyberspace advancements in the service of smarter agriculture. This group collaborated with several agribusinesses and software companies, and eventually birthed the early-stage development of yield monitors to create analytics for field testing.

"We set out, not only to create software that farmers could use to better understand their field but to develop the equations behind the software developments," remembers Ken. "We knew we were on the bleeding edge of something great, but it wasn't always easy to sell folks on computer software before most people were even familiar with computers."

During the '80s and '90s, Ken got involved in numerous national and international organizations promoting global soybean markets, dispensing precision agtech information, and encouraging collaboration between commodity groups. He traveled the world as an ambassador of U.S. soy, shaking hands with potential customers in Brazil, China, Taiwan, Japan, Argentina, and Europe.

His involvements spanned from the USDA to NASA, from the Chicago Federal Reserve to congressional ag committees. He was a founder of USSEC, and chaired a committee charged with mending the frayed relationship between the American Soybean Association (ASA) and the United Soybean Board (USB).

"The relationship had grown tense; we needed to establish the role of international marketing and how funding would be allocated to both groups," says Ken. "As conversations came up about making the national checkoff program mandatory, I emphasized that we needed to work together but we also needed to contribute together, enabling critical research and international market development. I always say, 'You gotta spend money to make money.'"

Today, Ken owns farmland in Piatt/Champaign County where he grows corn and soybeans. His wife, Barb, is a retired intensive care unit nurse who played an active role in community healthcare for many years. And while Ken feigns a modest humility where his own contributions are concerned, he has no trouble acknowledging Barb's indelible imprint.

"She made it her life's work to help and heal her community with expertise and compassion," he boasts. "She taught me that what you do is who you are."

When asked about agriculture's green revolution, Ken believes that renewable fuels are the way of the future. But like many of his colleagues, he has concerns about imminent regulations and the political environment. "I just hope that our ability to produce food to feed the world isn't overly restricted."

In December of 2022, Ken was awarded the Illinois Soybean Association Chairman's Award, which recognizes an individual who has gone above and beyond to serve the state's soybean interests. It is the highest award given by the Association, and is presented in appreciation of one's dedication, leadership, and years of service to the soybean industry.

"We felt Ken was most deserving of this prestigious award, not only due to his leadership and long relationship with the soybean family but because he possesses a rare synthesis of skills that transcends value across all industries and professions," says ISA Chairman, Steve Pitstick. "Ken is creative, technical and strategic, he is both a leader and a listener, he's got his eye on global trends but he's rooted in the success of his home and community."

Continues Pitstick, "Maybe most importantly, Ken doubles down on the ability to repair relationships in places they've grown thin and fragile. That's the hallmark of a natural leader."

Says Ken, "I was incredibly honored to receive this award, though I'm sure there are others more deserving. I'm just an old school, tech-loving farmer who follows his curiosities and cares about the people around me. Relationships at the local level with friends, neighbors and our communities, that's where our greatest opportunities lie. That's the real way of the future."

US SOYBEAN RESEARCH COLLABORATIVE
Working and Growing Together

# The Power of Building Networks

KATHERINE STOWE | DIRECTOR |
U.S SOYBEAN RESEARCH COLLABORATIVE

March is always an exhilarating month because of the anticipation it brings. It means planting season is almost (or for the very brave – already) here. The idea of planting new varieties, or incorporating a new production practice always brings exciting anticipation. It also means Commodity Classic. A week of exploring the latest and greatest ag innovations. Seeing new technologies and getting to visit and learn from new and old friends always brings me renewed energy.

A new season, new technologies, and new products all get me thinking more about ag innovation in general. And as I've had some time to reflect on these innovations over the last few weeks, it's made me realize innovation in agriculture is about more than just hardware and software, it also encapsulates how we think about problems and the ways we find solutions to those problems.

This is why I'm excited to share a little bit more about a new project ILSoy and many other state soybean associations are investing in – the U.S. Soybean Research Collaborative (USSRC). This new project is a soybean checkoff-sponsored partnership with the purpose of bringing more collaboration to soybean checkoff research.

We know the soybean industry and farming are changing. How do we stimulate research that will move the industry forward and propel U.S. soybean growers to meet these challenges? This is the key goal of USSRC. While the soybean checkoff has had tremendous success over the last 30 years, we've grabbed a lot of the low hanging fruit, and farmers' questions today are much more complicated than they were 30 years ago. It will take thinking about research differently to answer those questions and continue to drive the industry forward.

The U.S. Soybean Research Collaborative brings a unique model of open collaboration that helps extend current investments for more impactful outcomes. USSRC exists to advance coordination, collaboration, and communication among organizations focused on soybean research and to foster a broad value chain view to help bridge the gap between soybean supply and demand.

Over the last few months, I've had a chance to think about innovation from a number of different angles - an ag study tour to Brazil, meetings with industry partners discussing new technologies, convenings with other checkoff staff to discuss coordinated research programs, and visiting with colleagues at Commodity Classic.

These visits were eye opening, thought provoking, and really got my wheels turning about how we as a checkoff currently view ag innovation and how our current framework may need to change as we move into this next era of crop production. Below are a few questions USSRC will start working to address this year.

1. How can the checkoff play a role as a facilitator to bring farmers and innovators together? Can we provide a "collision" space that will foster productive conservations and lead to more efficient and effective solutions?

2. How do we effectively articulate farmers' needs to innovators or researchers? And help farmers recognize it may take thinking about a problem creatively to identify their greatest needs?

3. Can we help our research partners embrace "collaborative innovation" to bring solutions to the marketplace faster? Are there clear paths to market for new technologies the checkoff is investing in?

4. As we explore new and emerging uses of soy, what other partners should we be engaging with in the agtech space? Can we bring together our farmer and researcher network with their financial investments to impact change?

Each of these questions emphasizes the power of building networks. Networks where ideas can be shared, protocols can be debated, and innovative approaches can be discussed are critical. We all get better by sharing and we accelerate innovation by purposely interacting and collaborating – which is what USSRC strives to do.

So, as you are currently putting a tremendous amount of time and energy into researching what new "innovative" products or practices to incorporate in your operations, know that your checkoff is also critically thinking about innovation, in this case, how do we get you solutions to the challenges you face.

By working together, we will be better-positioned to meet the changing needs of the soybean industry and to take advantage of new opportunities.

Thoughts on innovation in ag? I'd love to hear them. Reach out to me at ***kstowe@iasoybeans.com*** or learn more about USSRC at ***soybeanresearchcollab.com.***


REMEMBER,
HE
CREATED
YOU
FOR THIS.
Don't be afraid. Just believe. Mark 5:36
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# Research Tweaks Planting Rules of the Road to Drive Yields

SOYBEAN RESEARCH & INFORMATION NETWORK

ILLINOIS SOYBEAN ASSOCIATION

## 1 START THE IGNITION EARLY

Much research has been devoted to planting date. The trend is to plant earlier, and research shows this can contribute to higher yields when planting into good soil conditions.

***Road to Success:*** Studies find treating seed with fungicides may be beneficial when planting early in cold, wet soils, especially in today's reduced and no-till fields. Newer fungicide seed treatments can help control seedling diseases that often accompany such spring conditions.

## 2 MONITOR TRAVEL CONDITIONS

Improved planter technology and seed quality have placed overseeding by 20-30% in the rearview mirror. That means farmers can count on more accurate plant populations only slightly lower than seeding rate. And that shaves input costs without sacrificing yield. While general, conventional wisdom is to plant 140,000 to 225,000 seeds per acre, studies have often shown that additional yield above 100,000 may be minimal, depending on row spacing and planting date.

***Road to Success:*** Variable rate seeding now permits farmers to tailor soybean plant populations according to conditions within established management zones in each field.

## 3 YIELD TO LOWER LIMITS

YIELD

Moist soils mean go time for soybean planting. That's because the seed needs to absorb 50 percent of its weight in water for germination. Good seed-to-soil contact at planting depths of 1"-1.5" inches is linked to higher yield potential. Shallower depths are best for early planting, high-residue and fine-textured soils. Plant deeper when late and in sandy, coarse-textured or dry soils.

***Road to Success:*** Checkoff-funded work is evaluating the development and availability of new planter technologies over the last decade to understand how to properly use and setup planters equipped with downforce, for example, in various tillage systems and soil conditions.

## 4 CHANGE LANES FOR BETTER PERFORMANCE

LANE SHIFT AHEAD

Studies confirm switching from wide to narrow rows can boost yields 3-7 bushels per acre, depending on management practices. Using 20" versus 30" rows keeps sunlight out of the canopy where weeds develop and preserves soil moisture, especially in double-crop soybeans.

***Road to Success:*** Newer soybean drill technology because the seed drop mechanism is controlled from the tractor cab for greater accuracy.

ON THE ROAD

## 5 KEEP YOUR EYES ON THE ROAD

Getting the most mileage at planting includes knowing whether a seed treatment is right for your situation. Seed treatments should be chosen based on controlling diseases, insects and nematodes prevalent in the area and for early pests scouted where economic thresholds have been met.

***Road to Success:*** Checkoff-funded field trials show widespread prophylactic use of neonicotinoid insecticide seed treatments, for example, may not be a wise expenditure because their use does not usually overlap with economically significant insect populations.

**SoybeanResearchInfo.com**

*Funded by the soybean checkoff*