

# IOWA STATE UNIVERSITY

## Iowa Soybean Research Center

### October 2024 Newsletter



Vol. 23

## ISRC Funds Three New Soybean Research Projects



The Iowa Soybean Research Center's (ISRC) Industry Advisory Council (IAC) met on September 6, 2024, for its annual meeting to consider proposed soybean research ideas and offer guidance on how to best invest \$393,795 in available new funding.

College of Agriculture and Life Sciences Dean Dan Robison kicked off the meeting, which was chaired by Iowa Soybean Association Chief Officer of Research and Conservation Christie Wiebbecke. The council is made up of 20 industry partner representatives and three Iowa soybean farmers.

From left, Mosaic's Tryston Beyrer, IAC Chair and ISA's Chief Officer of Research and Conservation Christie Wiebbecke, College of Agriculture and Life Sciences Dean Dan Robison and Professor Steve Whitham representing the Department of Plant Pathology, Entomology and Microbiology discuss the importance of soybean research in Iowa during the IAC meeting in September.

Based on the IAC's recommendations, the ISRC funded the following three new soybean research projects.

### New Projects

**Using Soybean Microbes as Protectants from Stress, Gwyn Beattie**, professor of plant pathology, entomology and microbiology, will use multiple approaches to explore the potential for microbes to serve as protectants for plants under certain stress conditions. Abiotic stresses including water deficit, salinity, low phosphate and acidity can negatively impact soybean growth and the number of flowers per plant, pods per plant, seeds per pod, and weight of pods. The study will reveal the effectiveness of approaches to enhance soybean stress tolerance that involve manipulating the microbial members and interactions within microbial communities on roots.



From left, Gwyn Beattie and Thomas Baum, plant pathology, entomology and microbiology and Walter Suza, agronomy, will lead three new ISRC-funded soybean research projects.



**Cyst Nematode Single-Cell Omics, Thomas Baum**, professor of plant pathology, entomology and microbiology, will investigate research ideas that are of primary scientific and academic interest but are directly relevant to future projects to target soybean cyst nematode. By way of new molecular approaches, key aspects of infection biology of the soybean cyst nematode will be uncovered. Successful completion of the work will reveal single-cell processes that govern nematode infection, which will lay the foundation for novel nematode control approaches.

**Investigating the Specific Role of Sterols in Soybean Growth and Development, Walter Suza**, George Washington Carver Endowed Chair and adjunct associate professor of agronomy, will seek to identify the genes responsible for making healthier phytosterols and explore their impact on soybean growth and development. Phytosterols are natural compounds found in plants that can help lower cholesterol levels in humans. The research will help identify soybean varieties with improved phytosterol content that are better adapted to stress conditions. Additionally, the research will be linked with the George Washington Carver Future Hunger Fighters Program, offering ISU students the chance to experience molecular biology research focused on a globally significant crop.



Top photo, attendees of the ISRC Industry Advisory Council meeting pose for a group photo. Bottom photos, the IAC split into smaller groups to discuss submitted research ideas before coming back together as a larger group. At left, ISRC Co-director Danny Singh and John Massman, Corteva Agriscience, discuss a research idea. At right, clockwise from left are Mike Rupert (in green), Innvictis/Simplot; Chris Souder, Bayer; Brent Swart, soybean farmer and ISA president; ISRC co-director Greg Tylka; Joe McClure, ISA director of research; Julia Daum, BASF; and Steve Brody, BioConnect Iowa.



# ISRC Hosts ISU Research Day

On September 5, 2024, the day before the center's Industry Advisory Council meeting, the ISRC hosted an ISU Research Day that featured updates on ISRC-funded projects and a poster session that showcased current research of 19 Iowa State graduate students and research staff. The posters were displayed for industry representatives, farmers and faculty with the opportunity to discuss and ask questions of the researchers. Poster topics ranged from numerous soybean-related issues to soil and regenerative agricultural practices.



At top left, ISRC Co-directors Greg Tylka and Danny Singh kick off Research Day at Reiman Gardens. At top right, poster presenters discuss their research with Industry Advisory Council members. Immediately above, a group photo of the ISRC's ISU Research Day poster presenters.



# ISRC Hosts Fourth Annual Meals from the Heartland Event



The ISRC hosted its fourth annual Meals from the Heartland food-packaging event on August 1. More than 50 ISU staff, students, faculty and some family members packaged 38,000 meals in two hours at ISU's Hansen Agriculture Student Learning Center. Many thanks to our volunteers and to Cargill who has sponsored the event each year with a generous monetary donation to cover the cost of the ingredients of the Taco Mac meals, which contain soy protein flour, enriched pasta and a vitamin- and mineral-fortified cheese.



Immediately above, from left, the ISRC's Kara Berg and Jill Cornelis, Meals from the Heartland's Ben Croghan and ISRC co-director Greg Tylka. Both organizations celebrated their 10<sup>th</sup> anniversaries and the ISRC became part of the 100,000 Meals Club.

The ISRC hosts the event in August to celebrate Soybean Month in Iowa. This year, the ISRC also continued its 10-year anniversary celebration by providing each volunteer with a color-coordinated team t-shirt, marked with a special 10-year anniversary design, and served a special anniversary cake at the end of the event. The ISRC received special recognition from Meals from the Heartland at the event for becoming a member of the 100,000 Meals Club, having packaged more than 130,000 meals in four years.

[Meals from the Heartland](#) works with teams of volunteers from local organizations to package meals for delivery to food insecure people in Iowa, across the U.S. and around the world. Some of the meals packaged at the ISRC event were delivered to food pantries at ISU and in downtown Ames.



Over 50 volunteers packaged 38,000 meals in two hours. At right, Professors Matt O'Neal and Alison Robertson, plant pathology, entomology and microbiology, and Ken Moore and Mark Licht, agronomy, help package meals.



## ISU Features ISRC-Funded Continuous Soy Project



Graduate student Carolina Freitas, left, and agronomy professor Sotirios Archontoulis collect data from an electronic probe buried in the soil to measure subsurface moisture in one of their experimental plots near Boone. *Photo by Christopher Gannon/ISU*

ISRC faculty affiliate Sotirios Archontoulis, agronomy, and graduate student Carolina Freitas were featured in a September 18, 2024, article by the Iowa State University News Service. The article highlights Archontoulis' continuous soybean project, which started in 2023 and is funded by the ISRC.

Experiments examining methods for planting and managing continuous production of soybeans are being conducted at ISU research farms near Sutherland in northwest Iowa and near Boone. Variations in soybean production practices being investigated include soybean-on-soybean planted at different row widths, continuous soybeans with rye cover crop and soybean-rye-soybean treated with manure, along with control plots of corn-soybean and corn-corn. [Full article](#)

## Welcome New Partners Indigo Ag and BioConnect Iowa

In August, the ISRC welcomed [BioConnect Iowa](#) and [Indigo Ag](#) as its newest industry partners. Each company has a representative on the ISRC's Industry Advisory Council and will provide financial support to the center, which is leveraged with soybean checkoff funds from the Iowa Soybean Association to support soybean research at Iowa State.

"We are excited to welcome BioConnect Iowa and Indigo Ag as our newest partners," said ISRC co-director Greg Tylka. "BioConnect Iowa will bring a unique, innovative and entrepreneurial perspective to the center and help us expand our reach. Indigo Ag is recognized for working collaboratively with other industry members for the good of Iowa farmers. They will complement the center's current partners very well."

"Collaborating with the Iowa Soybean Research Center, the Iowa Soybean Association, and industry partners is a crucial step in enhancing Iowa's leadership in bioscience innovation. This partnership will drive bioscience research in soybeans, bolster business growth in Iowa, attract and retain talent, and support Iowa's soybean farmers and industry," said Paul Schickler, chair of BioConnect Iowa's Board of Directors.

"Getting involved with the Iowa Soybean Research Center was a simple decision as we have been working with Iowa State University and the Iowa Soybean Association the last couple of years to validate bio control products that we have discovered and commercialized for soybean pests and pathogens. We truly want to partner with ISRC to enable and bring new innovations to soybean growers," said Corey Nikkel, director of sales enablement for Indigo Ag.

"We look forward to adding BioConnect Iowa and Indigo Ag to the ISRC Industry Advisory Council. BioConnect Iowa has a unique focus partnering with innovators and entrepreneurs, which will elevate our opportunity to translate research insights into action enhancing soybean farmers' productivity, profitability and sustainability. Indigo Ag brings an aligned perspective in advancing science- and technology-driven ag products that will



strengthen farmers' livelihoods," said Christie Wiebbecke, chief officer of research and conservation for the Iowa Soybean Association and chair of the ISRC's Industry Advisory Council.

## ISA Approves Funding for Soybean Research at Iowa State

At its June and September 2024 board meetings, the Iowa Soybean Association (ISA) approved funding for 12 research projects at Iowa State, which are:



**Thomas Baum**, PI, plant pathology, entomology and microbiology: "Translating Basic Research Knowledge into Soybean Resistance to the Soybean Cyst Nematode"

**Madan Bhattacharyya**, PI, agronomy: "Bioengineering of an NLR Gene for Creating Robust SDS Resistance in Soybean"

**Michael Castellano**, PI, agronomy, co-PIs Sotirios Archontoulis, agronomy, Melissa Miller, agronomy and Joe McClure, ISA: "Soybean Nitrogen Fertility for High-yielding Soybeans Following High-yielding Corn and Winter Cereal Rye Cover Crops"

**Katherine Kral-O'Brien**, PI, plant pathology, entomology and microbiology and co-PI Matt O'Neal, plant pathology, entomology and microbiology: "Identifying Pollinators and Resource Use in Corn-Soybean Based Crop Rotations"

**Mark Licht**, principal investigator (PI), agronomy and co-PI Fernando Marcos: "Amplifying ISA Investment through National Collaborative Research"

**Mark Licht**, PI, agronomy and co-PI Daren Mueller, plant pathology, entomology and microbiology: "Early Planting and Maturity Group Dynamics for Soybean Yield Enhancement in Iowa"

**Marshall McDaniel**, PI, agronomy and co-PI Asheesh "Danny" Singh, agronomy: "Do Soil Health Promoting Practices Make Soybean Production More Climate Resilient?"

**Daren Mueller**, PI, plant pathology, entomology and microbiology and co-PIs Mark Licht, agronomy and Edgar Neito-Lopez, plant pathology, entomology and microbiology: "Soybean Disease Management: Foliar Fungicides, Biological Fungicides, and Fungicide Resistance"

**Pranav Shrotriya**, PI, mechanical engineering and co-PIs Olga Zobotina, biochemistry, biophysics and molecular biology and Asheesh "Danny" Singh, agronomy: "Electrochemical Impedance Based 4D Mapping of Soybean Plant Root and Growth"

**Asheesh "Danny" Singh**, PI, agronomy and co-PIs Arti Singh, agronomy, Daren Mueller, plant pathology, entomology and microbiology, Baskar Ganapathysubramanian, mechanical engineering, Soumik Sarkar, mechanical engineering, Matt O'Neal, plant pathology, entomology and microbiology and Greg Tylka, plant pathology, entomology and microbiology: "Breeding High Yielding Soybean Cultivars for Iowa Farmers"

**Greg Tylka**, PI, plant pathology, entomology and microbiology: "Improving Profitability for Iowa Soybean Farmers with In-field Evaluations of SCN-resistant Soybean Varieties and Seed Treatments"

**Steve Whitham**, PI, plant pathology, entomology and microbiology and co-PIs Madan Bhattacharyya, agronomy and Bing Yang, plant science and technology, University of Missouri: "The Soybean Genome Editing Toolbox - Improving Disease Resistance and Drought Tolerance"

Each project will be entered into the [National Soybean Checkoff Research Database](#) where readers can learn about the projects' researchers, budget, objectives and experimental plans as well as read semi-annual progress reports and final results including explanations of how farmers will benefit from the work.

# ISRC Affiliates Involved in Five NCSRP-funded Projects



The North Central Soybean Research Program (NCSRP) approved \$2,781,886 in funding for continued research in fiscal year 2025 to support six university-based projects. Iowa State researchers are involved in five of those projects, as listed below.

**Madan Bhattacharyya**, agronomy, will serve as a co-principal investigator (co-PI) on a project led by Jianxin Ma, Purdue University, titled “SoyRenSeq: a Novel Approach for Disease Resistance Gene Discovery and Application for Soybean Improvement.”

**Erin Hodgson**, plant pathology, entomology and microbiology, will serve as a co-PI on a project led by Justin McMechan, University of Nebraska, titled “Management Tactics and Tools for Insect Pests in the North Central Region.”

**Daren Mueller**, plant pathology, entomology and microbiology, will serve as a co-PI on a project led by Richard Webster, North Dakota State University, titled “Advancing Soybean Health: Field Trials to Decision Support Tools to Maximize Disease Management.”

**Asheesh Singh**, agronomy will serve as a co-PI on a project led by Aaron Lorenz, University of Minnesota titled “SOYGEN3: Building Capacity to Increase Soybean Genetic Gain for Yield Through Combining Genomics-assisted Breeding with Characterization of Future Environments.”

**Greg Tylka**, plant pathology, entomology and microbiology, will serve as a co-PI on a project led by Dylan Mangel, University of Nebraska, titled “The SCN Coalition: A Checkoff-led, University-driven, Industry-Supported Partnership Battling Soybean’s Biggest Underground Threat.”

More information about these projects can be found on the [National Soybean Checkoff Research Database](#), which also provides information about project researchers, objectives, progress reports and final results including explanations of how farmers will benefit from the work.

## ISRC Sponsors Soy-related Panel Discussion



ISRC Co-director and Agronomy Professor Danny Singh welcomes the panelists and audience made up of ISU students and faculty.

In September, the ISRC sponsored a panel discussion hosted and organized by the Agronomy Graduate Student Council on the challenges and benefits of integrating conservation methods into farming practices. The panel included farmer Tim Burrack, Heartland Coop’s Ruth McCabe and Syngenta’s Brett Miller. The panel garnered a lot of interest and made for a lively discussion.

Burrack mentioned the many challenges farmers face when adopting new practices such as financial risks, the cost of special equipment, and certain attitudes, i.e., farmers wanting to continue doing things the way they’ve always been done or simply the fear of trying something new. Miller offered a compromise, “Farmers don’t need to do a bunch of new things. Maybe look at adopting one or two.”

McCabe said she has noticed older farmers, rather than younger ones, are more willing to adopt conservation practices. “Older farmers have seen too much soil erosion and recognize the need to try something different, such as implementing no-till and cover crops,” said McCabe. Other points made were that older farmers may



find themselves in a better position financially to take more risks when it comes to implementing conservation practices and land tenants may not be willing to take the financial gamble. Additionally, farmers would like to see better designed chemistry that is better for the environment and works the way farmers want.

The ISRC is sponsoring two more departmental seminars this fall. The Department of Agricultural and Biosystems Engineering will host [Professor Kaiyu Guan](#), University of Illinois, on October 28 from 12-1pm via [Zoom](#). He will present on “Advancing Agricultural Research in the Earth System Science Framework.” The Department of Agronomy will host Iowa Secretary of Agriculture Mike Naig on December 5.

## GDM Travel Grants Awarded to ISU PhD Students

Earlier this year, ISRC industry partner GDM initiated a travel grant program for ISU graduate students presenting research at scientific conferences in 2024. The ISRC is assisting GDM with the award process. The grants cover student travel expenses for attending the research conferences in recognition of the students’ outstanding research contributions. This program allows deserving graduate students to showcase their work on a national platform. The ISRC advertised the travel grant program among many departments at ISU, collected the applications submitted by graduate students, organized evaluation of the applications and administered the funds.

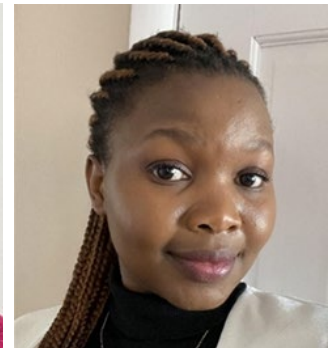
In June, GDM awarded two \$1,000 travel grants to students who presented their research at the National Association for Plant Breeding Meeting in St. Louis in July.

In July, PhD students Ramesh Chethri and Mercy Fakude each were selected for a \$1,000 GDM Travel Grant to attend the 2024 Tri-Society Meeting, November 10-13, in San Antonio, Texas. The Tri-Society is jointly hosted by the American Society of Agronomy, the Crop Science Society of America and the Soil Science Society of America.

Chethri, an Interdepartmental Genetics and Genomics PhD student under Dr. Madan Bhattacharyya, was selected for his research on the “Identification of Drought-tolerant Genotypes Using Integrated Temperature and Humidity Sensors in Soybean.” Fakude, a PhD student in Plant Breeding under Dr. Thomas Lubberstedt was selected for her research on “Enhancing Maize Productivity through Spontaneous Haploid Genome Doubling.”



Ramesh Chethri



Mercy Fakude

## Uruguayan Farmers Learn About Crop Management in Iowa

On August 26, ISRC faculty affiliate Mark Licht, agronomy, spoke with a group of 24 Uruguayan farmers about soybean and corn management in Iowa. The group, hosted by ISRC industry partner GDM, met at the ISU Field Extension Education Lab near Boone, Iowa while the group was in the area for the Farm Progress Show. ISRC Industry Recruiter Steve May also accompanied the group.

Licht took questions through an interpreter for over an hour. There was great discussion with the farmers who had many similarities to Iowa farmers in terms of demographics and farm size.



Above, ISRC faculty affiliate Mark Licht presents on crop management practices in Iowa.



# ISRC Hosts Visiting Farmers from Brazil

On behalf of the Iowa Soybean Association's Producer Services Team, the ISRC hosted a group of 40 farmers from Brazil on Iowa State's campus on August 27. ISRC faculty affiliates from the Department of Agronomy spoke to the group on a variety of topics. Mark Licht provided the group with an overview of soybean management practices in Iowa. Sotirios Archontoulis and graduate student Carolina Freitas described their continuous soybean production research. Susana Goggi led a tour of the Seed Science Center. The farmer group was in Iowa attending the Farm Progress Show in Boone.



Top right, ISRC faculty affiliate Mark Licht, agronomy welcomes the group of farmers from Brazil. Bottom left, the group visits the Seed Science Center. Bottom right, ISRC faculty affiliate Susana Goggi assists with a tour of the Seed Science Center.

# Coordinated Soybean Centers Group Annual Meeting

The Coordinated Soybean Centers Group (CSCG) held their annual meeting in Indianapolis, Indiana on July 24 in conjunction with the Soybean Research Forum and Think Tank Workshop. The CSCG includes representatives from eight centers in Iowa, Missouri, Minnesota, Indiana, Ohio, Kentucky, Illinois, and North Carolina and their respective state soybean associations.



Members of the CSCG participate in small group discussions.

Representing Iowa at the meeting were ISRC Co-director Greg Tylka, Iowa Soybean Association Chief Officer of Research and Conservation Christie Wiebbecke and ISRC Research Administrator Jill Cornelis, who organized this year's meeting. The North Central Soybean Research Program (NCSRP) and the U.S. Soybean Research Collaborative (USSRC) co-sponsored the meeting. NCSRP Director Ed Anderson opened the meeting, then representatives from each center provided brief updates and USSRC Director Katherine Drake Stowe offered a summary of the Soybean Research Forum and Think Tank.



The remainder of the meeting was spent in small group discussions facilitated by ISU Sociologist Katie Dentzman and graduate student Joe Hollis. Each group was asked to respond to six questions that focused on helping the soybean centers group figure out where they “fit” and how they can function together. The group works to foster collaboration, identify funding opportunities and deliver high-quality research, teaching and Extension programs to enhance soybean farming and the soybean industry. These efforts complement and extend other checkoff-funded work to ensure increasingly high quality, sustainable, productive and profitable soybeans and soybean products for domestic and global markets.

## Integrated Crop Management Conference Dec. 11-12, 2024

The annual Iowa State University Extension Integrated Crop Management (ICM) Conference will be held at the Meadows Events Center, at Prairie Meadows in Altoona, Iowa, December 11 and 12, 2024.

Iowa's premier crop production education event, the ICM Conference brings together a diverse range of topics, a slate of expert presenters and results of the latest university research. The event draws crop production professionals from across Iowa and the Midwest.



[Additional program details and registration](#) will be available Fall 2024.

## Save the Dates: Crop Advantage Series Jan. 2-29, 2025

Iowa State University Extension Crop Advantage meetings provide current, research-based crop production information to help farmers make informed decisions in their farming operations.

### 2025 Dates and Locations

January 2	Storm Lake
January 7	Sioux Center - NEW LOCATION!
January 8	Burlington
January 9	Mason City
January 14	Okoboji
January 16	Cedar Falls
January 17	Davenport
January 21	Atlantic
January 22	Ankeny
January 23	Coralville
January 28	Le Mars
January 29	Templeton



[Additional information](#) for the 2025 Crop Advantage Series will be available late fall 2024.



## Season 5 CropsTV Jan. 7-April 15, 2025

Iowa State University Extension CropsTV will return for a 5th season this winter. Additional information, including a [program lineup and registration](#), will be available later this fall.

CropsTV episodes can be watched on demand, on any device with a web browser at your convenience. Episodes range from 25-60 minutes and cover a variety of topics unique to CropsTV. Instructors are Iowa State University faculty, staff, Extension specialists and guest presenters from around the Midwest. Viewers can earn more than 20 CCA continuing education units by viewing all episodes.



## ISRC Affiliates Named Global Top Agri-food Pioneers



Walter Suza



Lisa Schulte Moore

ISRC faculty affiliates Walter Suza, agronomy and Lisa Schulte Moore, natural resource ecology and management, were named Top Agri-Food Pioneers (TAP) by the World Food Prize Foundation this fall. The two Iowa State faculty members are among 38 global innovators selected for their transformative food systems work in recognition of the World Food Prize Foundation's 38th anniversary.

These TAP trailblazers driving change in agriculture and global food security form the first TAP cohort, according to the World Food Prize Foundation. The TAP awardees will be recognized at the 2024 Borlaug Dialogue in Des Moines, Oct. 29-31. [Full article](#)

## ISRC Affiliates Receive University Awards

Congratulations to the following ISRC faculty affiliates who recently received university awards.

**Kan Wang**, agronomy, was recognized as the Charles F. Curtiss Distinguished Professor in Agriculture and Life Sciences, Iowa State University's highest academic honor.

**Eric Cochran**, chemical and biological engineering, received the Achievement in Economic Development in Iowa Award.



Kan Wang



Eric Cochran

**Susana Goggi**, **Marshall McDaniel** and **Ken Moore**, agronomy, and **Amy Kaleita**, agricultural and biosystems engineering, were recognized as part of an Interdisciplinary Team Research Award for their involvement in RegenPGC (Regenerating America's Working Landscapes to Enhance Natural Resources and Public Goods through Perennial Groundcover). [Read more](#)



## Upcoming Events

**October 28**, 12-1pm, ISU Department of Agricultural and Biosystems Engineering Seminar featuring Professor [Kaiyu Guan](#), University of Illinois via [Zoom](#)

**December 5**, ISU Department of Agronomy will host Iowa Secretary of Agriculture Mike Naig

**December 11 & 12**, ISU Extension [ICM Conference](#), the Meadows Events Center, Altoona, Iowa

**January 2-29**, ISU Extension [Crop Advantage Series](#), 12 locations across the state

**January 7-April 15**, ISU Extension [CropsTV Season 5](#), online

**Each Wednesday at Noon** - [Iowa Learning Farms Webinars](#)

Keep up with what's new at the ISRC on [LinkedIn](#) and [X](#) (formerly Twitter).

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Have a newsletter idea or wish to subscribe? Email us at [ISRC@iastate.edu](mailto:ISRC@iastate.edu)