IOWA STATE UNIVERSITY

Iowa Soybean Research Center

July 2025 Newsletter

Vol. 26

ISRC Announces Leadership Transition

On July 1, 2025, Iowa State University Associate Professor of Agronomy Mark Licht and Professor of Plant Pathology, Entomology and Microbiology Steve Whitham joined the Iowa Soybean Research Center (ISRC) as co-directors. After 11 years of leadership, founding ISRC Director and Morrill Professor of Plant Pathology, Entomology and Microbiology Greg Tylka will step away from the center at the end of 2025 allowing him more time to focus on his research responsibilities in the area of soybean cyst nematode (SCN).

ISRC leadership from left ISRC founding Director Greg Tylka, newly named Co-directors Mark Licht and Steve Whitham and Joe McClure of the Iowa Soybean Association who also serves as ISRC Industry Advisory Council Chair.

Licht, an extension cropping systems specialist, and Whitham, an expert in molecular plant pathology, have both been long-time faculty research affiliates of the ISRC and are well known and respected in their areas of expertise. The addition of Licht and Whitham highlights the long-term commitment of Iowa State University in support of soybean research. The co-directors will work together to expand the research and educational activities of the center while maintaining a focus on soybean production research.

“I would like to thank Dr. Tylka for his leadership and dedication to the Iowa Soybean Research Center and I am excited for the center’s future with the addition of Drs. Licht and Whitham whose complementary areas of expertise will serve as strengths for the center,” said Asheesh “Danny” Singh, ISU associate dean for research and discovery for the College of Agriculture and Life Sciences.

“The Iowa Soybean Association looks forward to continuing our partnership with ISRC and building on the successes of the past decade with Steve and Mark in this newly formed co-directorship. They will bring many strengths to the center and both continue to focus their research on challenges and opportunities that are central to soybeans and Iowa farmers,” said Iowa Soybean Association Chief Officer, Research Center for Farming Innovation Joe McClure, who also serves as the ISRC’s Industry Advisory Council Chair.

“I am grateful for Steve and Mark joining leadership of the center, which is critically important to the college and Iowa State University as well as to the Iowa Soybean Association and Iowa’s soybean farmers. These two individuals add great expertise and perspective to the center,” said ISRC Director Greg Tylka.

Licht, a faculty member in the Department of Agronomy since 2016, has spent his career helping crop farmers improve their operations as an agronomist with ISU Extension and Outreach. His expertise is in soybean and corn, as well as cover crops and conservation measures. His extension, research and teaching program has focused on how to holistically manage Iowa cropping systems to achieve productivity, profitability and environmental goals. Licht has a bachelor’s degree in agronomy and agricultural extension education, a master’s in soil science and a doctorate in crop production and physiology, all from Iowa State.

Whitham has been a faculty member in the Department of Plant Pathology, Entomology and Microbiology since 2000. His research has focused on developing virus-based tools to analyze gene functions in crop plants with particular interest in soybean and corn, functional genomics of plant-virus interactions and molecular determinants of soybean-soybean rust interactions. He also teaches courses in plant-microbe interactions, molecular plant pathology and virology. Whitham earned his bachelor’s degree in agricultural biochemistry from Iowa State and master’s and doctoral degrees in plant pathology from the University of California, Berkeley.

ISRC to Host SoyFest 2025 and Additional Activities in August for Soybean Month in Iowa

In celebration of Soybean Month in Iowa (August), the ISRC will host its third biennial SoyFest from 10am to 2pm, August 27, 2025, on Iowa State University’s central campus near Parks Library and Marston Hall. This free, outdoor celebration of all things soy is held during the first week of fall classes at ISU and features numerous soy-related exhibitors, ISU research labs and student clubs highlighting the importance of soy and its many uses in everyday life from food to new and innovative products. SoyFest will feature grilled pork, turkey and soy-veggie burgers, soy-related snacks, robotic and other technological demonstrations, soy-themed prize giveaways, carnival games, soy-based ice cream and a visit by Cy.

New to SoyFest this year are Skechers Shoes, Cross Plains Solutions and Dynamic Green Products. Skechers uses soybean oil in some of its footwear, specifically in the outsoles of their Goodyear Collection. Cross Plains Solutions manufactures soy-based, non-toxic firefighting foams. Dynamic Green Products manufactures a variety of bio-based oil products. For more information on SoyFest and additional exhibitors and participants, please visit the SoyFest webpage.

Also during Soybean Month, the ISRC will be hosting a Meals from the Heartland meal packaging event sponsored by Cargill on August 1 and a Farm/Field tour for ISU graduate and post-doctoral students, faculty and staff to Wyffels Hybrids Ames Production and Demonstration Facility and the Alliant Energy Solar Farm at ISU on August 5. Look for highlights on all of the ISRC’s Soybean Month activities in the ISRC’s October newsletter.

ISA Approves Soybean Research Funding at Iowa State

ISRC Director Greg Tylka gives the ISA Productivity Committee an update on the center's activities.

ISRC staff attended the Iowa Soybean Association's summer Productivity Committee meeting on July 1, 2025. Director Greg Tylka gave an update on the center, introduced new co-directors Mark Licht and Steve Whitham and mentioned the center's upcoming activities for August, which is Soybean Month in Iowa. Also attending the meeting to provide department updates from Iowa State were Mary Wiedenhoeft, agronomy, Steve Harris, plant pathology, entomology and microbiology and Josh Peschel, agricultural and biosystems engineering. In addition, College of Agriculture and Life Sciences Associate Dean for Research and Discovery Danny Singh provided an update on his soybean breeding program.

The next day, the full ISA board met to review and approve funding for 15 research projects at Iowa State, which are:

Sotirios Archontoulis, principal investigator (PI), agronomy, co-PIs Carolina Freitas, Mark Licht and Michael Castellano, agronomy: "Continuous Soybean Production with Rye Cover Crop"

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 and Melissa Miller, agronomy: "Leveraging the Iowa Nitrogen Initiative to Understand the Effects of Corn Residue Management on Soybean Production and Water Quality""

Erin Hodgson, PI, plant pathology, entomology and microbiology, co-PI Matt O'Neal, plant pathology, entomology and microbiology and advisor Brad Coates, USDA-ARS: "Turning Soybean Aphid Management Around"

Erin Hodgson, PI, plant pathology, entomology and microbiology, co-PI Aaron Gassmann, plant pathology, entomology and microbiology: "Value of Diversified Management to Reduce Yield Losses from Insect Pests"

Katherine Kral-O'Brien, PI, plant pathology, entomology and microbiology, 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, co-PI Fernando Marcos, agronomy: "Amplifying ISA Investment through Science for Success"

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

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

Richard Roth, PI, agronomy, co-PIs Mark Licht and Larousse Dorissant, agronomy: “Influence of Tillage, Nutrient Placement, and Seeding Method on Soybean Growth and Development”

Richard Roth, PI, agronomy, co-PIs Mark Licht and Larousse Dorissant, agronomy: “Optimizing Sulfur Management in Iowa Soybeans: When, Where, and How Much?”

Pranav Shrotriya, PI, mechanical engineering, co-PIs Olga Zabotina, 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, co-PIs Arti Singh, agronomy, Baskar Ganapathysubramanian and Soumik Sarkar, mechanical engineering, Daren Mueller, Matt O’Neal 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”

“The soybean farmer-directors are excited about the quantity and quality of the proposals submitted for funding from Iowa Soybean Association and the great work occurring with researchers and the impact that farmers should see in their own fields over time,” said Joe McClure, chief officer, Research Center for Farming Innovation, Iowa Soybean Association.

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 Welcomes Tidal Grow AgriScience

The ISRC is pleased to announce that Tidal Grow AgriScience has joined the center as its newest industry partner. Yuan Cheng will serve as the company’s representative on the ISRC’s industry advisory council, which provides guidance on research needs and funding priorities for the center.

“We’re excited to join the ISRC and stand with those pushing soybean innovation forward,” said Yuan Cheng, Chief Product Officer at Tidal Grow AgriScience. “Our solutions are built to tackle growers’ toughest challenges, and we’re committed to novel modes of action that complement existing solutions to drive real gains in yield and grower ROI.”

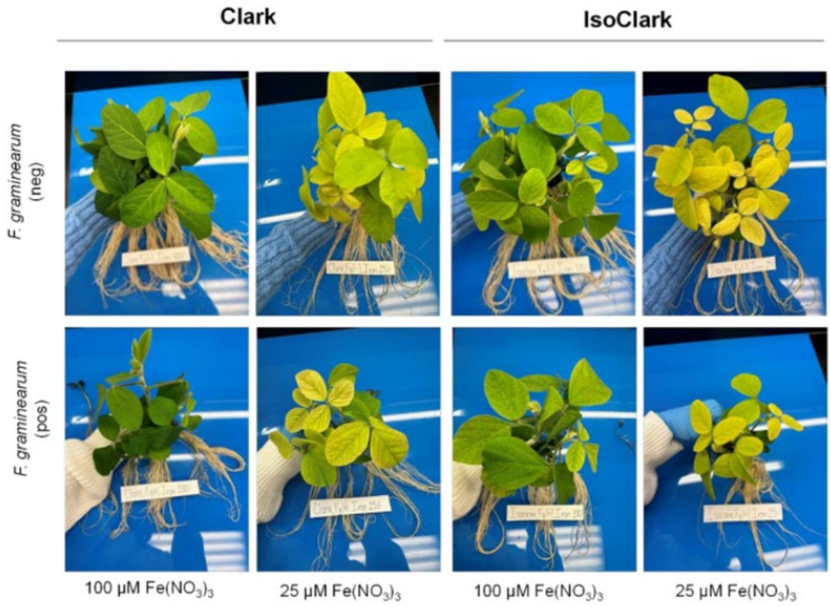
“We are delighted to add Tidal Grow AgriScience to the center as an industry partner,” said Greg Tylka, director of the ISRC and professor of plant pathology, entomology and microbiology at Iowa State. “I have worked with Tidal Grow personnel for almost two years and have been impressed with their interest and drive to bring products to market that protect and improve soybean yields. With such a goal, they will fit in perfectly with the center’s other industry partners.”

“Tidal Grow is a great addition to the Iowa Soybean Research Center and will be a great partner to Iowa farmers. We need all ideas and all solution-makers at the table to guide the center to deliver the most impactful and innovative research to advance soybeans as a premier crop in Iowa, and Tidal Grow has proven to be a creative and collaborative partner that will advance our mission,” said Joe McClure, chief officer, Research

Center for Farming Innovation, the Iowa Soybean Association and chair of the ISRC Industry Advisory Council.

ISRC-funded Project on Iron Deficiency and *Fusarium graminearum* in Soybean Reaches Completion

ISRC research affiliate Silvina Arias, plant pathology, entomology and microbiology in collaboration with Jamie O'Rourke, USDA-ARS, recently provided a final report on their ISRC-funded research project titled, "Characterization of Iron Deficiency and *Fusarium graminearum* Interactive Responses in Soybean." The objective of the study was to identify soybean genes affected by *Fusarium graminearum* infection in an iron deficiency environment to help identify new potential resistance mechanisms and candidate genes involved in the defense response. Iron deficiency and Fusarium root rot, a disease caused by the fungus *Fusarium graminearum,* can cause significant yield reductions and substantial economic losses for soybean growers.



Above, Clark and Isoclark soybean seedlings were grown under iron-deficient and normal iron conditions; inoculated and non-inoculated with *F. graminearum.*

This study led to the identification of genes in leaves of soybean varieties Clark (9,315 genes) and IsoClark (4,765 genes) that were infected by the Fusarium infection making the genes a high priority to characterize and study in the future. Similarly, 8,195 genes differentially expressed due to Fusarium infection in Clark roots and 6,407 in IsoClark roots were identified. These genes can now be studied to better understand the infection and plant response to Fusarium infection.

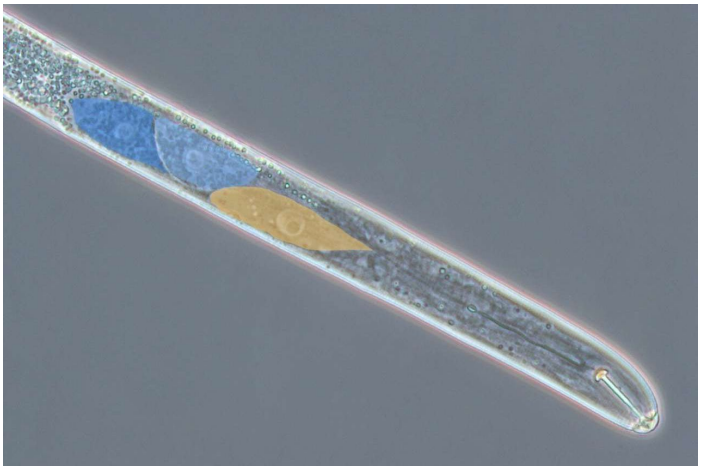
Arias and O'Rourke also identified 781 genes in leaves and 190 in roots with expression patterns that change direction under iron deficiency stress and Fusarium infection. These genes indicated an interaction between iron deficiency and Fusarium infection that has not been previously reported. The results offer insight into how soybean responds to Fusarium infection. Understanding soybean responses to these stresses is crucial for more effective management and may also be useful in developing new methods to broaden the resistance of soybean to *Fusarium graminearum* infection and iron deficiency.

Also, during the course of this study, a new bioinformatics pipeline tool was developed to manipulate large file sizes, which will greatly improve the speed at which future analyses take place. For example, what once took three hours, now takes one minute.

A final report for this project may be viewed via the ISRC's website.

ISRC Affiliate's Research Focuses on Targeting Newly Discovered Vulnerability in SCN

Targeting a newly discovered vulnerability in the signals that cyst nematodes use to infect plant roots could be a powerful method for reducing the damage the parasitic worms cause in crops such as soybeans, according to a study co-authored by Iowa State University Distinguished Professor of Plant Pathology, Entomology and Microbiology Thomas Baum.



Above, a cyst nematode juvenile head region viewed through a high-power microscope shows its esophageal glands, which produce effectors it uses to infect host plants. The subventral glands responsible for SUGR-1 are colored blue. *Photo illustration by Tom Maier and Thomas Baum/Iowa State*

Researchers identified a single protein in cyst nematodes that triggers dozens of chemical signals called effectors that the microscopic roundworms release inside roots to "hijack" plant cells and make themselves a home, said Baum.

Though the protein – a transcription factor that binds to genes, turning them on or off – is likely one of several that regulate effector production, researchers found that without it, the nematode infection is severely reduced, according to the study recently published in Proceedings of the National Academy of Sciences. The discovery could lead to major progress in reducing the destructiveness of soybean cyst nematodes, which cost U.S. farmers nearly 90 million bushels in production last year – by far the crop's most damaging pest. This research is funded in part by the North Central Soybean Research Program. Full article

ISRC Focuses on Upcoming Activities at Staff Retreat

The ISRC held its annual staff retreat in June at the Iowa Arboretum near Madrid, IA. ISRC staff brought newly added co-directors Mark Licht and Steve Whitham and new Industry Advisory Council Chair, Joe McClure, "up to speed" on the center's upcoming activities. Particular attention was given to planning the ISRC's Research Day and annual Industry Advisory Council Meeting, scheduled for September 8 and 9, respectively. The group reviewed 16 research ideas submitted by faculty affiliates that will be considered for ISRC funding at the IAC meeting with input from the ISRC's industry partners and farmer representatives.

The ISRC staff discusses upcoming center-sponsored events during their June staff retreat.

Details were set for the ISRC/ISU Research Day, which was started last year following suggestions from the ISRC's industry partners. The event was a big hit with the council's industry partners, farmers and fellow ISU researchers alike. This year's Research Day will provide IAC members with updates on current ISRC-funded

research projects and there also will be a graduate student poster session. At last year's event, 19 graduate students and research staff presented posters, highlighting ISU's up-and-coming research talent and a wide range of agricultural research.

ISRC Research Affiliate Attracts Interest with Usage of Sensors in Agriculture

Above left, from left, the Iowa Soybean Association's Mickayla Jordan interviews ISRC faculty research affiliate researcher Liang Dong and Nutrien's Aman Anand for an episode of ISA's State of Soy video series. Above right, from left, Krystel Navarro, Ashley Hudson and Brendon Lane of Corteva examine some of the sensors Liang Dong is working on his lab at ISU.

The ISRC recently hosted visits with researchers from Nutrien Ag Solutions and Corteva Agriscience, connecting them with ISRC faculty research affiliate Liang Dong, electrical and computer engineering. The visiting researchers were interested in Dong's project, initially funded by the ISRC, in which he developed and used sensors in row crops to detect the early onset of diseases. Completed in fall 2024, the project went on to receive federal funding through USDA-NIFA. More about Dong's ISRC-funded research may be found on the ISRC's website.

During the visits, Dong provided a presentation on the different types of plant sensors he has created for monitoring plant viruses and the detection of nitrogen, water and organic compounds found in soil, followed by tours of his research labs at Iowa State.

In addition, the Iowa Soybean Association featured Dong's research in their State of Soy video series, which included ISRC industry partner representative Aman Anand, senior manager of digital and agronomic collaboration with Nutrien.

Weed Science Field Day Held at ISU Curtiss Farm

At left, about 90 people attended the ISU Extension Weed Science Field Day at Curtiss Farm near Ames. Above, weed scientist Wesley Everman discusses herbicide trials.

The ISU Extension and Outreach Weed Science program held a Weed Science Field Day on July 2, 2025 at Curtiss Farm in Ames. The day provided approximately 90 farmers and crop industry consultants in attendance with the latest information on integrated weed management practices, herbicide efficacy and application timing and new technologies.

ISU weed scientist and ISRC faculty research affiliate Wesley Everman, with the help of area ISU Extension agronomists, led a tour of some of the trials in progress at Curtiss Farm. Everman has approximately 60-70 herbicide evaluation and weed control trials this year to evaluate new and existing herbicides for weed control in corn and soybeans.

ISRC Participates in Life Sciences Day

ISRC staff participated in the second annual CALS Life Sciences Day luncheon celebration in the Advanced Teaching and Research Building (ATRB) in April.

Staff shared information about the center and its upcoming activities with faculty, students and staff. Attendees enjoyed participating in a spin-the-wheel soy-trivia game to learn more about soybeans and win a prize. The center distributed soy recipe booklets from the Iowa Food and Family Project and also SoyFest activity booklets with soy crayons.

Above right, ISRC's Jill Cornelis chats with students about soy recipes available in free cookbooks provided by the Iowa Food and Family Project.

ISU President Wintersteen to Retire in January 2026

Wendy Wintersteen

ISU President Wendy Wintersteen recently announced plans to retire in January 2026, concluding an Iowa State career that has spanned 46 years.

Wintersteen began her career at Iowa State as an extension field specialist in integrated pest management while completing her doctorate in entomology. Upon graduating, she rose through the ranks to become a professor and held several leadership roles, including Dean of the College of Agriculture and Life Sciences (CALS) from 2006-2017. Following a nationwide search in 2017, she was selected as ISU's 16th president, the first woman to hold the university's highest office.

During her tenure, Iowa State established global prominence in innovation and entrepreneurship in higher education and was named the 2023 Entrepreneurial University of the Year for the Americas. ISU's agricultural programs have consistently ranked in the top 10 worldwide. While serving as Dean, CALS enrollment rapidly increased to become the third-largest college of agriculture in the nation, research grants increased markedly, awards for teaching excellence grew and the college achieved a 98% placement rate for its graduates. Full article

Ritchie Selected as ISU Agronomy Chair

Glen Ritchie began serving as professor and chair for Iowa State's Department of Agronomy, on July 15, 2025. As Agronomy Chair, Ritchie will serve on the ISRC's Management Team.

He takes over for Mary Wiedenhoeft, who has been interim department chair since May 2023. Wiedenhoeft will remain with the department as a Morrill Professor of Agronomy.

Ritchie was a professor of crop physiology and served for five years as chair of the Department of Plant and Soil Science at Texas Tech University. During his career there, he focused on plant water relations, resource partitioning and plant sensing techniques in cotton and other crops. He currently serves as editor of the journal Crop Science and is a member of the American Society of Agronomy, the Crop Science Society of America and the Soil Science Society of America.

Glen Ritchie

Ritchie earned a BS in crop science and an MS in crop physiology from Utah State University and his PhD in crop physiology from the University of Georgia. Full article

Heuchelin Selected as ISU Seed Science Center Director

Scott Heuchelin

Scott Heuchelin began his new role as director of ISU's Seed Science Center and professor in the Department of Plant Pathology, Entomology and Microbiology on July 15, 2025.

Heuchelin spent the past 22 years with Corteva Agriscience, working as a plant pathologist in the plant breeding organization. He was the senior scientist – global phytosanitary risk mitigation lead. His global regulatory and seed advocacy experience involved working with scientists, government officials and international seed associations to deal with seed disease issues and drafting quarantine, seed testing and inspection policies for the global seed sector.

Heuchelin earned a BS in biology from the University of Northern Iowa and his MS and PhD in plant pathology from Iowa State. Full article

Plant Breeding PhD Students Selected for Awards

Congratulations to plant breeding PhD students Liza Van der Laan and Joscif Raigne, advised by Agronomy Professor Danny Singh. Van der Laan, who earned her PhD this spring, was selected for the 2025 Karas Award for Outstanding Dissertation at Iowa State University, one of the most prestigious graduate student awards. The award was established to recognize excellence in doctoral research at Iowa State.

From left, Danny Singh with former PhD student Liza Van der Laan, who was selected for the 2025 Karas Award.

According to Singh, Van der Laan has “done pioneering work on important traits in soybean using different 'omics methods in plant breeding research. Her work on improving heat stress tolerance in soybean is paving the way for the development of improved varieties.” She and the Danny Singh Lab had received research funding from the Iowa Soybean Association, the AI Institute for Resilient Agriculture at Iowa State and the Raymond F. Baker Center for Plant Breeding Plant Sciences Institute. She also was involved in the ISRC-funded project on the Effects of Increased CO_2 and Heat Stress on Soybean Performance. Van der Laan is now a postdoctoral researcher at the University of Florida.


From left, Danny Singh with PhD student Joscif Raigne who received the CSSA Mott Award.

Raigne was selected for the CSSA Mott Award. This award is provided to a meritorious graduate student in crop science. The scholarship is supported by gifts from the Gerald O. Mott family to the Agronomic Science Foundation and administered by the Crop Science Society of America.

2025 University Award Recipients

Several ISRC faculty research affiliates will be among the more than 75 ISU faculty and staff selected to receive university awards; the highest recognitions available to Iowa State employees. The following awardees will be honored at a celebration later this fall.

Asheesh “Danny” Singh, agronomy, and associate dean for research and discovery for the College of Agriculture and Life Sciences, will receive the *Margaret Ellen White Graduate Faculty Award*. The award recognizes a member of the graduate faculty who has demonstrated exceptional mentorship and measurable impact on graduate students, both during their time at Iowa State and beyond graduation. Recipients are selected by members of the Graduate and Professional Student Senate.

Lisa Schulte Moore, natural resource ecology and management, will receive the title of *Distinguished Professor*. The title is Iowa State's highest academic honor. It recognizes a faculty member whose accomplishments in research or creative activities have had a significant impact on their discipline nationally or internationally and who has demonstrated outstanding performance in at least one other area of faculty responsibility (teaching/advising, extension/professional practice or institutional service). Nominees must hold the rank of professor and have served at least five years on the Iowa State faculty.

Gustavo Macintosh, biochemistry, biophysics and molecular biology, will receive the title of University Professor. The title is awarded to a faculty member whose professional work has focused on effecting positive, significant institutional change at the university and has demonstrated outstanding performance in at least one other area of faculty responsibility (research/creative activity, teaching/advising or extension/professional practice). Nominees must hold the rank of professor and have served at least 10 years on the Iowa State faculty.

The Iowa State Soynomics Team will receive the Award for Outstanding Achievement in Interdisciplinary Team Research. Members of the Soynomics team include ISRC affiliates Liang Dong, Fernando Miguez, Daren Mueller, Matt O'Neal, Arti Singh, Asheesh "Danny" Singh and Greg Tylka. Additional members of the team include Aditya Balu, Baskar Ganapathysubramanian, Soumik Sarkar and Talukder Jubery.

Upcoming Events

August 1: ISRC Meals from the Heartland Packaging Event at Hansen Ag Student Learning Center, Ames, IA

August 5: ISRC Farm/Industry Tour to Wyffels Hybrids Ames Production and Demonstration Facility & Alliant Energy Solar Farm at ISU

August 27: SoyFest 2025, Iowa State University, Ames, IA

September 8: ISRC Research Day, Reiman Gardens, Ames, IA

September 9: IAC Meeting, ISU Alumni Center, Ames, IA

Each Wednesday at Noon - Iowa Learning Farms Webinars

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

Special thanks to the Dr. Keith and Virginia Smith Family
for providing funding to make this newsletter possible.

IOWA SOYBEAN RESEARCH CENTER

Have a newsletter idea or wish to subscribe? Email us at ISRC@iastate.edu