Singh Joins Iowa Soybean Research Center at Iowa State University as Co-Director

The ISRC is excited to announce that Asheesh “Danny” Singh, professor of agronomy with expertise in soybean breeding and phenomics at Iowa State, has joined the ISRC as co-director. He holds a courtesy appointment in the Department of Agricultural and Biosystems Engineering.

“Danny is the perfect person to join me in leading the ISRC,” said founding director Greg Tylka. “I look forward to working shoulder to shoulder with him to advance the center to greater heights and in new dimensions.”

Singh’s new role with the center highlights the long-term commitment on the part of Iowa State University in its support of soybean research. With the addition of Singh and in honor of the ISRC’s 10-year anniversary in July, the co-directors will work together to expand the research and educational activities of the center while maintaining a focus on soybean production research.

“Danny and Greg are a great team. They encourage research in all that they do, so it’s a very natural fit for these two to lead the ISRC into the next decade together,” said Associate Dean for Research and Discovery Carolyn Lawrence-Dill.

“I embrace this new role with humility and determination. I look forward to working with Dr. Tylka, the Iowa Soybean Association, and industry partners to improve soybean production and profitability in a coordinated manner. I look forward to learning from the ISRC staff and helping foster increased collaboration among the ISRC-affiliated faculty members and their teams,” said Singh.

“The Iowa Soybean Association looks forward to continuing our partnership with the ISRC, building upon the successes of the past decade with Danny and Greg in this newly formed co-directorship,” said Iowa Soybean...
Association Chief Officer of Research and Conservation Christie Wiebbecke, who also serves as the ISRC’s Industry Advisory Council Chair.

Singh joined Iowa State University in 2013 as a faculty member in agronomy and has been an affiliate of the ISRC since its inception in 2014. He has published over 160 peer-reviewed papers, authored a textbook on plant breeding, and developed >70 varieties grown on more than 10 million acres annually. He has delivered 75 invited presentations nationally and internationally. He has received ISRC funding on two collaborative projects, one focused on soybean root and microbiome traits and the second on the effects of increased CO2 and abiotic stress on soybeans.

In 2023, Singh was appointed G.F. Sprague Chair by Iowa State’s Department of Agronomy and named a Crop Science Society of America Fellow. He serves as an associate chair for discovery and research of the university’s Department of Agronomy and provides leadership to the Soynomics research group, which in 2022 received the College of Agriculture and Life Sciences Team Award. In 2021, Singh received the ISU’s Mid-Career Achievement in Research Award and the department of Agronomy’s Raymond and Mary Baker Agronomic Excellence Award.

**ISRC Shares Think Tank Results**

The ISRC hosted a Think Tank workshop in September with nearly 40 soybean stakeholders to learn about soybean production research needs and to generate ideas to help guide the center’s future research efforts.

Facilitators, organized, trained and led by Katie Dentzman, assistant professor of sociology, assisted by assigning participants to small groups comprised of soybean farmers, industry partners, commodity partners and university researchers at six tables. Participants were asked to answer three broad questions through small group table discussions regarding challenges/barriers in soybean production, soybean research and topics that soybean research was not addressing. A fourth question separated the groups into larger peer groups (farmers with farmers, researchers with researchers, etc.) and asked stakeholders to discuss what they had learned from the first three questions in their small groups.

Notecards were used by participants to record their thoughts and ideas to help drive table discussions. One representative from each table was designated to take notes and report out their findings to the large group. The facilitators collected both notes and notecards from each table to compile a final summary.

Following the Think Tank, a survey was sent to provide participants an opportunity to express opinions on the value of the workshop and share any final comments either missed or unanswered during the workshop.
Dentzman’s team then put together a summary of the workshop. Below are links to summaries from participants’ notecards, the report-out notes from each table and the workshop survey results.

Notecards summary
Notes summary
Survey summary

Many valid research topics were identified during the discussions, which the ISRC will use to help prioritize future research investments. These will be shared with the center’s research affiliates during a call for soybean research ideas this spring. Some specific soybean production themes that rose to the top included pests, extreme weather events, soybean physiology, soil health, and soybean composition, genetics and breeding. Many thanks to all who participated.

Researchers Provide Final Reports on two ISRC-funded Projects

The ISRC received two final reports on projects completed in fall of 2023. Following are outcome summaries from those projects.

Lie Tang, professor of agricultural and biosystems engineering, reported on his “In-Field Soybean Seed Pod Analysis on Harvest Stocks Using 3D Imaging and Machine Learning” project. The last paragraph in Lie’s report summarized the project results.

“In this project, we proposed an automated soybean seed and pod counting system consisting of a robotic platform and a set of deep learning based 3D point cloud processing algorithms for high throughput operations using images captured from two sides of the soybean plant. The results demonstrate that the proposed soybean pod and seed counting methods produced better accuracies than counting them using images captured from only one side of soybean rows. The proposed system can greatly reduce human effort. In the future, the counting and classification accuracies of the proposed system can be further improved by using more image samples to train the deep learning model as some highly overlapping pods were not detected. Besides, the accuracy of pod identification could be improved by combining multiple features like distance and inclination angle. Also, when there were overexposures, the quality of images was decreased, causing degraded 3D reconstruction. Improving the illumination uniformity of the strobe lights will alleviate this problem.” Full report

Prashant Jha, professor of agronomy (now at Louisiana State University), reported on his project “Enhancing Implementation and Adoption of Non-Chemical Tactics for Integrated Weed Management in Soybean.” He reported the following results.
“A cereal rye cover crop (3-4 feet tall, with biomass of at least 4000 lbs/acre), when terminated at soybean planting, was very effective in reducing waterhemp density (by 35-40%) and seed production (up to 90%) compared with the no cover crop treatment. Waterhemp plants retained greater than 70% of seeds at the typical harvest dates of soybean in Iowa. Header loss accounted for 30% of waterhemp seed losses at soybean harvest and additional 10-15% losses occurred at the grain tank and from seeds escaping through the combine thresher (chopper).

The Redekop™ Seed Destructor unit physically destroyed greater than 90% of waterhemp seeds that entered the combine at soybean harvest. Those seeds were mostly non-viable and failed to germinate. Thus, cover crops and weed seed destruction are effective integrated weed management tactics to mitigate herbicide-resistant waterhemp seedbanks in Iowa soybean production systems. These non-chemical tactics can reduce reliance on herbicides and preserve the utility of existing herbicide tools in soybean. In addition, my program successfully implemented the seed destructor technology at corn harvest in Iowa in 2022, indicating that growers can use this harvest weed seed control method in both corn and soybean phases of the rotation for a faster decline in weed seed banks.” This project went on to receive additional funding from the USDA-National Institute of Food and Agriculture Crop Protection and Pest Management program and was leveraged with multi-state (IA, AR, KS, IL) collaborations. Full Report

![Different levels of physical damage of pigweed seeds after passing through the Redekop Seed Destructor (high impact mill).](image)

**CropsTV Season 4 Underway**

ISU Extension and Outreach’s CropsTV is back for its 4th season with 35 episodes. Viewers can watch at their own pace and in any order. The first batch of episodes were released January 2, 2024. Additional episodes are released weekly through February 13, 2024. Over 25 CCA continuing education units will also be available.

There are no software or apps to install, simply click and view in any browser. Subscribers will receive a CropsTV Guide email newsletter with program updates, speaker highlights and schedule reminders sent to subscribers periodically during the viewing season.

Visit the [CropsTV](#) website to register and to view a [schedule of episodes](#) that include several ISRC affiliates.

**Crop Advantage Meetings Scheduled for January 2024**

Iowa State Extension and Outreach is holding its Crop Advantage Series throughout the month of January at multiple locations. The meetings, which involve several ISRC affiliates, provide a solid foundation of current, research-based crop production information to help make smart, informed decisions in the farming operation. Attendees may also participate in a private pesticide applicator continuing instruction course and/or earn continuing education credit for certified crop advisers. Visit the [Crop Advantage Series website](#) for more information.
ISA’s Innovation to Profit Series to be Held in February

The Iowa Soybean Association will be holding their annual Innovation to Profit Series regionally in February. The main goals of the sessions are to provide research data to boost profitability, productivity and sustainability; engage with farmers to discuss challenges and opportunities in their local areas; and to connect farmers with regionally-based ISA agronomists, conservation agronomists and producer services team members. For more information and to register, click on the location links below.

- Feb. 6, 10:30am-2pm in Storm Lake
- Feb. 8, 10:30am-2pm in Fairfield
- Feb. 13, 10:30am-2pm in Lewis
- Feb. 15, 10:30am-2pm in Waterloo

ISRC Affiliates Present Crop Information at ICM Conference

Iowa State University Extension and Outreach held its 34th Integrated Crop Management Conference at its new location at Prairie Meadows in Altoona, Iowa, in December 2023. Over 580 people, including farmers, commodity group staff, industry scientists and university researchers attended the conference.

Several ISU researchers presented their latest research information and crop management recommendations including ISRC affiliates Sotirios Archontoulis, Mike Castellano, Mark Licht, and Antonio Mallarino, agronomy; Erin Hodgson, Daren Mueller, Alison Robertson, and Greg Tylka, plant pathology, entomology and microbiology; Matt Darr and Matt Helmers, agricultural and biosystems engineering and Chad Hart, economics. Specific to soybean, Mark Licht spoke on the latest in soybean management, Daren Mueller presented on white mold of soybean and Greg Tylka spoke on the latest SCN management strategies, including SNAP.
As part of the ISRC’s yearlong, 10th anniversary celebration and education and outreach program, the center will be sponsoring select seminar speakers to present at Iowa State University on a variety of soybean-related topics. On Tuesday, April 2nd from 3-4pm, Justin McMechan, assistant professor of crop protection and cropping systems at the University of Nebraska, will present on “Soybean Gall Midge: Understanding Risk and Management Options” as part of ISU’s Department of Plant Pathology, Entomology and Microbiology spring seminar series. The seminar will be held in room 1330 of the Advanced Teaching and Research Building and will also be available via Zoom.

McMechan provided the following background information. Soybean gall midge was recently discovered as a new species and an economically significant soybean pest in the Midwestern U.S. Since its discovery in 2019, it has been found in 164 counties across seven states. Under heavy infestations, feeding from the larvae has the potential to result in a near complete loss of yield for the first 100 feet along the field edge, with an average yield loss of 18-31% on an entire field. As a new species, several gaps exist in its biology as well as practical management strategies. This presentation will provide the latest information on the biology, hosts, scouting and potential management tactics for soybean gall midge.

ISRC Partner Mike Peterson Receives ISU Alumni Award

By the ISU Alumni Association

Mike Peterson, president and owner of Peterson Genetics, Inc., located in Cedar Falls, Iowa was a recent recipient of the Iowa State University Alumni Association’s Floyd Andre Award. A 1984 ISU graduate in agricultural business, Peterson has had a profound impact on Iowa agriculture and has been a local supporter of ISU.

As a leading provider of soybean germplasm to the North American soybean seed trade, Peterson’s company attributes its success to soybean research and genetics. That is why it is no surprise that through his leadership, Peterson Genetics joined the Iowa Soybean Research Center at ISU through both financial support and an advisory role through their industry council.

Peterson’s expertise in the industry developed through over 30 years of experience and through a variety of local and national industry leadership positions. He is a past President of the Iowa Seed Association, past Chair of the Soybean Division of the American Seed Trade Association and past Chairman of the American Seed Trade Association.

Beyond the leadership of his company’s partnership with ISRC, Peterson has remained personally engaged with ISU with significant support of the Stark Performance Center and the College of Agriculture and Life Sciences. The Peterson Genetics Seed Science Center Graduate Fellowship provides a great example of his commitment to research and development. He is also a proud recipient of the Agricultural Business Club’s Outstanding Alumni Award.
“Mike Peterson has seemingly endless energy and creativity. He has greatly shaped the soybean industry in Iowa and the Midwest. The guidance Mike provides to our Iowa Soybean Research Center is invaluable, and we are lucky to have him on our advisory council. We feel he is an outstanding choice as a recipient for this award,” said ISRC Co-director Greg Tylka.

Peterson is a life member of the ISU Alumni Association. He also belongs to the Order of the Knoll, W.M. Beardshear Society and Campanile Society and is a Cyclone Club member. He is the father of five children – Ben, Josh, Natalie, Nicke and Sofie.

The Floyd Andre Award honors a College of Agriculture and Life Sciences alumnus or friend who has made outstanding contributions to production agriculture, agricultural business or has had a significant impact on Iowa agriculture. The award was established in 1978 in honor of Andrew Floyd, who earned his BS, MS and PhD degrees at Iowa State and served as Dean of the College of Agriculture from 1949-1972.

Get to Know IAC Farmer Rep: Brent Swart

Brent Swart is one of three Iowa soybean farmer representatives on the ISRC’s Industry Advisory Council (IAC). The council identifies research needs in the areas of soybean production and protection for the center. Farmer representatives serve three-year terms on the council and provide feedback on what research topics are of importance to soybean farmers.

Swart farms full-time with his brother, Steve, near Spencer, Iowa. He is a 5th generation farmer and has been in farming for 18 years, growing soybeans and corn. Swart implements strip and no-till practices and uses cover crops on the majority of his land. Swart earned his BS in agronomy and MS in crop production and physiology from Iowa State University. Swart and his brother also own Cotton Grave Farm Management where they work with farmers and landowners to implement sustainable farming practices to improve soil health and productivity.

Swart is president-elect of the Iowa Soybean Association, as well as a District 1 director. In addition, Swart also serves as a farmer member of the Midwest Soybean Collaborative, a director for Community State Bank, and a board member for the Spencer Regional Healthcare Foundation. Swart is also a member of the American Soybean Association, National Corn Growers Association and Iowa Farm Bureau.

NCSRP Funds Iowa State Researchers

The North Central Soybean Research Program (NCSRP) approved $4.29 million in funding for continued research in fiscal year 2024 to support nine university-based projects. Iowa State researchers are involved in six 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.”

Thomas Baum and Greg Tylka, plant pathology, entomology and microbiology, will serve as co-PIs with others in a project led by Andrew Scaboo, University of Missouri, titled “An Integrated Approach to Enhance
Durability of Soybean Cyst Nematode (SCN) Resistance for Long-term, Strategic SCN Management (Phase III)."

Erin Hodgson and Matt O’Neal, plant pathology, entomology and microbiology, will serve as co-PIs on a project led by Kelley Tilmon, The Ohio State University, titled “Research and Extension on Emerging Soybean Pests in the North Central Region.”

Daren Mueller, plant pathology, entomology and microbiology, will serve as a co-PI on a project led by Damon Smith, University of Wisconsin, titled “Multi-Dimensional Approaches for Improved Productivity, Sustainability, and Management of Major Soybean Diseases in the North Central United States.”

Danny Singh, agronomy, will serve as a co-PI on a project led by Aaron Lorenz, University of Minnesota, titled “SOYGEN 3: Building Capacity to Increase Soybean Genetic Gain for Yield and Composition 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 Sam Markell, North Dakota State University, titled “The SCN Coalition: Economics and Advancing Management.”

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 how farmers will benefit from the work.

ISU Researchers Funded by USB

The United Soybean Board (USB) approved more than $6 million in research funding to support a total of 19 projects involving ISU researchers for fiscal year 2024. Following are projects that involve 13 ISRC affiliates as PI (principal investigator) or co-PI.

Silvina Arias, plant pathology, entomology and microbiology (PPEM), Daren Mueller, PPEM, Arti Singh, agronomy, Gary Munkvold, PPEM, and Leonor Leandro, PPEM, will serve as co-PIs on a project titled “Seedling pathogens in soybean: Disease management and farmer education” led by Febina Mathew, North Dakota State University.

Madan Bhattacharyya, agronomy, will serve as PI on two projects titled “Molecular Mapping and Development of a Phytophthora and Sudden Death Syndrome Resistant Cultivar” and “Introgression of Drought and Flood Tolerance Genes into Four Elite Soybean Cultivars Through Backcrossing.”

Eric Cochran, chemical and biological engineering, will serve as PI with Chris Williams, civil, construction and environmental engineering, as co-PI on a project titled “Next Generation High Oleic Polymers.”

Leonor Leandro, PPEM, will serve as PI with Daren Mueller, PPEM, and Danny Singh, agronomy, as co-PIs on a project titled "Biology and Management of Soybean Stem Diseases."

Mark Licht, agronomy, will serve as co-PI on a project led by Joe McClure of the Iowa Soybean Association titled “Nationwide Validation of Management Methods for Sustainable Soy.”

Daren Mueller, PPEM, will serve as PI on a project titled "Crop Protection Network: Delivering Soybean Research Results to Farmers through National Partnerships."

Management Program for the Main Foliar Diseases of Soybean” led by Ahmad Fakhoury, Southern Illinois University.

Alison Robertson, PPEM, will serve as co-PI on a project titled “Developing Perfect Molecular Markers and New Germplasm for Rapid Incorporation of Resistance to Soilborne Pathogens of Soybean” led by Feng Qu, The Ohio State University.

Danny Singh, agronomy, will serve as co-PI on a project titled “Discovering and Deploying Genetic Solutions Across Maturity Groups for Durable Resistance to Multiple Nematodes” led by Zenglu Li, University of Georgia and “Yield Limitations of Soybean Varieties Under Drought: Identifying and Overcoming Weaknesses by Team Drought via Breeding, Genomics, Phenomics and Physiology” led by Ben Fallen, USDA-ARS.

Greg Tylka, PPEM, will serve as co-PI on a project titled “SCN Profit Checker Campaign” led by Sam Markell, North Dakota State University.

Updated Extension Corn and Soybean Field Guide Available

A new, pocket-size “Corn and Soybean Field Guide” is now available for corn and soybean growers, agronomists and crop scouts. Published by ISU Extension and Outreach in August 2023, the guide is an updated version of the guide that was published in 2016. The guide includes many of the same topics as the previous version, but with important updates, including new crop issues such as tar spot and soybean gall midge. The agronomic information has also been updated with input by Dr. Mark Licht, agronomy. The 236-page guide is $15 through the extension store and pdf downloads are available for $5.

Upcoming Events

January 3-30, 2024, multiple locations across Iowa - ISU Extension Crop Advantage Series

January 2-April 5, 2024 - CropsTV Season 4

February 6, 8, 13 and 15, four regional locations - ISA’s Innovation to Profit Series

Each Wednesday at Noon - Iowa Learning Farms Webinars

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