

# IOWA STATE UNIVERSITY

## Iowa Soybean Research Center

### July 2020 Newsletter

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Visit our website at [www.iowasoybeancenter.org](http://www.iowasoybeancenter.org)

## Research Staff Spring into Action During Unusual Planting Season

To say it was a crazy spring would be an understatement. COVID-19 brought with it a wave of uncertainty and fast-moving changes for Iowa State researchers. As precautions were being developed and put into place for employee safety, ISU field research staff felt a sense of urgency to get planting done as soon as possible. On the upside, Iowa's weather cooperated for a change. In fact, it was one of the earliest planting seasons in recent memory.

Greg Gebhart, an agricultural specialist in plant pathology and microbiology at Iowa State said

the team he works with scrambled to make alternative plans in case a shelter-in-place would have been ordered. Planning included identifying fields on Iowa State-owned farms throughout the state for the nine large experimental sites that were to be established on privately owned farmland. Luckily, those alternative plans did not have to be implemented. Gebhart said staff put together and planted one small experiment on Iowa State-owned farmland near Ames in mid-April, just in case a decision was made that prevented planting elsewhere. This experiment is now known as the "Panic Plot."

"The level of stress was greater because we often felt like we were trying to run as fast as we could towards an undefined target," said Gebhart. "We put in some long days early on, in order to get seed packaged and ready to plant weeks earlier than normal. It was a great benefit that most of our work



EB Wlezien, a graduate student of Professor Greg Tylka, pours soybean seed into a plot planter for an experiment on a farm in north central Iowa in May. Photos by EB Wlezien and Greg Gebhart.

keeps us in the middle of farm fields isolated from people. We actually had more things planted earlier than ever.”

The only hiccup was a brief freeze that occurred the second week in May, but fortunately the plants grew out of the minor frost damage and it did not reduce stand. “We have some after-effects of doing field work earlier than normal, including some weed issues due to pre-emergent herbicides that were applied at earlier than ideal timing,” said Gebhart.

Overall, it seems like things went well this planting season for Iowa State soybean field researchers and farmers alike. Now, let’s just hope the weather continues to cooperate and a second wave of the virus can be avoided come harvest time. One thing is for sure, there is never a dull moment when it comes to working in agriculture!



Incorporating Covid-19 safety precautions proved relatively easy for ag research staff who generally physical distance while out in the field anyway. Extra precautions such as keeping equipment sanitized and wearing gloves were implemented. *Photo by Greg Gebhart.*

*Gebhart is part of a crew of five, including two graduate students and two other staff, who work for Greg Tylka, a professor of plant pathology and microbiology and director of the ISRC.*

## ISU/ISA On-Farm Fieldwork Coordination Continues

Each year, Iowa State University and the Iowa Soybean Association work together to facilitate and coordinate fieldwork for different on-farm trials. This planting season, researchers are working on studies with a focus on soybean gall midge and the interaction of soybean planting date with cultivator maturity.

According to Scott Nelson, director of agronomy for the ISA’s Research Center for Farming Innovation, in 2019 researchers observed a highly significant yield advantage for planting later maturity soybean cultivators early. In 2020, they are continuing this research with replicated strip trials at Iowa State research farm locations. The trials will provide farmers with data that will help with next year’s planting decisions.



Soybean plants emerge in a field.

Another hot topic continues to be soybean gall midge. Research in this area will continue with direction from Erin Hodgson a professor of entomology with ISU Extension.

Nelson added that scientific guidance, idea generation and protocol development are extremely important to ISA/ISU collaborations. “Probably the most important interaction we have with ISU is getting advice on different approaches to data, ideas and protocol development,” said Nelson.

ISU Extension Field Agronomist Mike Witt echoed Nelson’s sentiments, “We work together in development of protocols and ideas for trials as well as determining what projects fit both the scope and

capabilities of our perspective groups. When we find a project that works, we try hard to collaborate on these to provide high quality data for both ISU On-Farm Demonstration Trials and ISA.” Witt said collaborations between Iowa Soybean Association and ISU On-Farm Demonstration trials are important to provide Iowa farmers with high quality, locally generated data. “Our collaborations have the abilities to test new emerging products, explore innovative practices and create a base of knowledge for farmers to make sound economic decisions.”

ISRC Extension and On-Farm Research Coordinator Clarke McGrath said another benefit of ISA/ISU collaborations is that it lends itself to accelerating the pace and volume of getting critical research-based information out to Iowa soybean farmers and service providers. “It’s a continuous cycle,” said McGrath. “Ideas come from researchers, industry and growers; ISA and ISU researchers put together research protocols and implement trials on ideas; research teams and farmers carry out the trials; data is collected, analyzed and shared with staff from industry, ISA and ISU who share it with stakeholders. New ideas/needs for information come every year to perpetuate the cycle.”

## Collaboration in Research is Key

By Ed Anderson, Senior Director of Research, [Iowa Soybean Association](#)

The Iowa Soybean Association (ISA) has a long history of partnership with Iowa State University spanning over 55 years. ISA’s partnership with the Iowa Soybean Research Center (ISRC) is just one of the latest versions of this long and productive history. The ISA, led by a 22-member farmer board that represents other soybean farmers across the state, strives to invest checkoff dollars into research, market



Ed Anderson in front of the ISA offices in Ankeny. Photo by Joseph L. Murphy, ISA.

development, and the promotion of and new uses for soybeans. The ISA pursues memberships and other non-checkoff funding to work with and on behalf of Iowa’s nearly 38,000 soybean farmers to promote policy and accomplish research and technical assistance that complements and extends the checkoff investment.

Creation of the ISRC in 2014 developed a new area of opportunity and the perfect fit to further leverage checkoff dollars with funding from the soybean industry and ISU to identify research needs and to financially support the work. Doing so will help drive and advance improvements for the soybean industry and farmers in ways that have not been achieved before, especially on non-proprietary and broadly beneficial topics.

The ISA investment in the ISRC includes a push for the center to identify and seek industry support. While the ISA understands that companies will continue to invest in individual researchers at ISU, and we certainly encourage that, the opportunity for the ISRC is to bring industry engagement through the Industry Advisory Council and financial investments that will provide support for broader, more mutually beneficial areas of research and extension. The goal is to build collaborations where farmers, companies, and ISU researchers and extension staff can dialogue about soybean research and outreach

priorities and then provide financial investments that complement and extend checkoff dollars for short- and long-term farmer benefits. This level of collaboration will lead to even better research and extension work at ISU, perhaps in some areas that we had not considered in the past.

Soybean research is a big space and the ISRC is just another way of trying to fill some of those opportunities and niche areas. And, it is so important, especially given current circumstances and economic uncertainty that we continue to fund research, which ultimately helps Iowa's farmers and Iowa's economy.

## ISRC Funding Highlight

Each year, the ISRC funds soybean-related projects after receiving feedback on research priorities from the ISRC Industry Advisory Council. The council is made up of representatives from the ISA, Iowa soybean farmers, and the center's industry partners. Following is an update on a project that received funding and support from the center for fiscal years 2019-2021.

### Virus-mediated Gene Editing in Soybean

Last fall, two soybean research projects were selected to receive funding from the Iowa Soybean Research Center. Following presentations and discussions at the ISRC's Industry Advisory Council and Management Team meetings, Steve Whitham, a professor in plant pathology and microbiology at Iowa State University, was awarded \$100,000 for two years.

His research builds on previous experiments using plant viruses to perform gene editing in soybean, work that was initially funded by the ISU Plant Sciences Institute. Expanding this research could eventually lead to enhancement of soybean varieties by way of improving agronomic traits, disease resistance and seed quality.

While this project is still in its early stages, Whitham said his team has been focused on building the resources that will be used in the experiments, which include:

- modifying the genome of a soybean virus to carry CRISPR guide RNAs,
- implementing a strategy that enables simple and rapid cloning of CRISPR guide RNAs in a soybean virus genome, and
- growing transgenic plants that contain the Cas9 protein (a protein that uses CRISPR guide RNAs to induce site-specific edits in genomes).

"We previously demonstrated that it is feasible to use a virus to deliver CRISPR guide RNAs and cause genome edits in other plants including maize," said Whitham. "We are excited for the opportunity to apply what we have learned in order to test the possibility of using virus-based gene editing technologies in soybean."



Steve Whitham

# Merschman Seeds Becomes Latest ISRC Partner

Merschman Seeds, located in West Point, Iowa, has joined the Iowa Soybean Research Center at Iowa State University as an industry partner. In this role, [Merschman Seeds](#) provides financial support to the center and will have a representative serving on the ISRC Industry Advisory Council, which provides guidance on research funding priorities for the center.



“My father was a founding member of the Iowa Soybean Association, so we strongly believe in the good work that the Iowa Soybean Association does to help Iowa farmers achieve profitable yields through the Iowa Soybean Research Center. It is always smart to invest in the future of the Iowa soybean farmer,” said Joe Merschman, president and CEO of Merschman Seeds, Inc.

“Merschman Seeds is a great addition to the growing list of industry partners that the center is engaged with, and we look forward to working with them,” said Greg Tylka, director of the Iowa Soybean Research Center and a professor of plant pathology and microbiology at Iowa State. “We value Merschman’s support of the center to help realize our mutual goals of protecting and increasing soybean yields in Iowa.”

“The addition of Merschman Seeds as an industry partner will help to increase the collaborative efforts of the center by supporting the needs of Iowa soybean farmers through research, production and protection,” said Ed Anderson, senior director of research for the Iowa Soybean Association and chair of the Iowa Soybean Research Center Industry Advisory Council.

The center is a formal collaboration of industry partners, the Iowa Soybean Association (ISA) and Iowa State’s College of Agriculture and Life Sciences. Together, representatives from ISA and the industry partners make up the ISRC Industry Advisory Council, which include BASF, Bayer, Cornelius Seed, Corteva Agriscience, FMC, GDM, Merschman Seeds and Syngenta.

## Soybean Centers Submit Research Proposals

The Soybean Centers Coordination Group, comprised of directors and staff from university soybean centers and state soybean associations from Iowa, Illinois, Indiana, Kentucky, Missouri, and Ohio met last fall to explore potential research topics and funding avenues. Following several more meetings online, group members and colleagues at their universities submitted three proposals, two to the United Soybean Board (USB) and one to the North Central Soybean Research Program (NCSRP). Topics of the proposals were increasing soybean protein, improving use of Unmanned Aerial Systems for targeted management of soybean, and understanding soil health as it relates to soybeans.



Katy Rainey  
Purdue University



Steve Culman  
The Ohio State University

The center coordination group, which functions much like a think-tank, was started by Ed Anderson, Senior Director of Research for the Iowa Soybean Association (ISA) and Executive Director of NCSRP. Meetings of the group are made possible with funding from the USB and meeting coordination assistance from the Iowa Soybean Research Center. “The group was created with the intent of boosting collaboration among states and to further leverage soybean research funding and checkoff dollars,” said Anderson.

Katy Rainey, associate professor of agronomy at Purdue University and director of the Purdue Soybean Center, took the lead in writing the two proposals submitted to the USB for funding consideration. One proposal addresses increasing demand for soybeans in plant-based proteins by building multidisciplinary teams with agronomists, geneticists, economists, social scientists, food scientists, and nutritionists. Rainey said, “We want to explore new techniques for minimally processing soy protein foods and to educate colleagues in other fields on the value of alternative compositional profiles, presenting them with the soybean “menu” of higher protein, reduced oligosaccharides, etc. We also seek to address consumer acceptance.” Rainey says the best outcome would be to interest new audiences and industries in the potential for soybeans, so that USB investments are leveraged and expanded.

The second proposal aims to identify the best remote sensing technologies for targeted management of soybean by accelerating the use of unmanned aerial systems for targeted management in farmers’ fields. Goals of the project include managing the stressors of soybean, a lead to the conceivable drop to partial field applications instead of whole field applications, and improved knowledge for detection of stressors. This research has the potential to expand regionally in scale for stress prediction and for focused management of frogeye, gall midge, aphids, stem borer, etc.

Steve Culman, assistant professor and state specialist in soil fertility at The Ohio State University took the lead on submitting a proposal to the NCSRP on an integrated on-farm approach to understanding soil health and soybean productivity. If funded, the long-term plan would be to build toward a larger, more expansive and multi-year on-farm project. Participating institutions include The Ohio State University, Iowa State University, University of Missouri and the University of Kentucky.

The Soybean Centers Coordination Group plans to meet later this fall to discuss the status of the above-mentioned proposals, possible future proposals and ways the group should continue to work together to meet and build partnerships going forward.

## Researcher Spotlight: Matt Helmers

ISRC affiliate Matt Helmers is director of the Iowa Nutrient Research Center and is a professor of Agricultural and Biosystems Engineering with research and extension responsibilities in the College of Agriculture and Life Sciences at Iowa State University.

Helmets is from Sibley, Iowa and graduated with a BS in Civil Engineering from Iowa State University in 1995. He earned his MS in Civil Engineering from Virginia Tech in 1997 and his PhD in Agricultural Engineering from the University of Nebraska-Lincoln in 2003. Has been on faculty at Iowa State since 2003 where he has been involved in water quality projects and Iowa Learning Farms.



Matt Helmers, director of the Iowa Nutrient Research Center  
*Photo by Christopher Gannon, Iowa State University.*

His research areas include studies on the impact of nutrient management, cropping practices, drainage design and management, and strategic placement of buffer systems on nutrient export from agricultural landscapes.

In 2013, The Iowa Nutrient Research Center (INRC) was established by the Iowa Board of Regents in response to legislation passed by the Iowa Legislature to pursue science-based approaches to nutrient management research. Since 2014, the INRC has funded 92 research projects for a total of \$10.7 million in land management, nutrient management, edge-of-field practices and multi-objective research. Headquartered at Iowa State University, the INRC operates in collaboration with the University of Iowa, University of Northern Iowa, U.S. Department of Agriculture, Iowa Department of Natural Resources and Iowa Department of Agriculture and Land Stewardship. The INRC is funded through state appropriations and receives input from an eight-member [advisory council](#) as determined by the legislature.

As a native Iowan who grew up around agriculture, Helmers would like Iowa to continue to have a vibrant agricultural ecosystem, but one that includes the health and stewardship of our natural resources. “We are a heavy agricultural state with a water quality problem, and the only way to address the problem is to get conservation practices implemented,” said Helmers.

To this end, Helmers says farmers and landowners are important partners who help make it possible to test research in different farming and geographic situations. He is also working with these groups to increase the adoption of practices that have the potential to reduce downstream nutrient export. For more information, visit the [Iowa Nutrient Research Center website](#).

## SoyFest Postponed to 2021

With so much uncertainty surrounding the COVID-19 pandemic, ISRC staff have decided to reschedule SoyFest, which was planned for August 26, 2020. The undergraduate-student-focused event was to occur during Soybean Month in Iowa, August, and during the first week of fall semester classes at Iowa State. SoyFest is now planned for Wednesday, August 25, 2021.



ISRC staff plan to make the 2021 event even bigger and better than originally planned. If you or your organization would like to contribute with a financial donation, provide soybean-related giveaways, volunteer or have a booth at next year’s event, please contact us. For more information and updates, visit [www.iowasoybeancenter.org/soyfest.html](http://www.iowasoybeancenter.org/soyfest.html).

## Next Gen Leaders

Seed World recently featured their top 10 picks for “next gen leaders” and two faces familiar to the ISRC made the list. Will Cornelius of Cornelius Seed, serves as an ISRC industry partner representative and Kevin Falk of Corteva, is a former graduate student of ISRC affiliate Danny Singh. Additionally, Corteva is also an ISRC industry partner. Check out the article on [Seed World’s website](#).



Will Cornelius



Kevin Falk

# Congratulations ISRC Research Affiliates

The ISRC would like to recognize and congratulate several Iowa State University research affiliates who received awards and promotions over the past year.

## Awards

### University Awards:

Sylvia Cianzio, [Regents Award for Faculty Excellence](#)  
Erin Hodgson, [Distinguished Service in Extension and Outreach](#)  
Gary Munkvold, [Regents Award for Faculty Excellence](#)  
Danny Singh, [Mid-Career Achievement in Research](#)  
Michelle Soupir, [McNair Faculty Mentor of the Year](#)  
Greg Tylka, [Morrill Professor](#)

### College of Agriculture and Life Sciences Awards:

Thomas Brumm, [Outstanding Achievement in Teaching](#)  
Mark Licht, [Early Achievement in Extension and Outreach](#)  
Daren Mueller, [Outstanding Achievement in Extension and Outreach](#)  
Arti Singh, [AgOnline 2019 Teacher of the Year](#)  
Danny Singh, [Raymond and Mary Baker Agronomic Excellence](#)  
Michelle Soupir, [Diversity Enhancement](#)  
Kan Wang, [Outstanding Achievement in Research](#)  
Steve Whitham, [Rossmann Manatt Faculty Development](#)

### Scientific Society Awards:

Gwyn Beattie, [American Phytopathological Society Fellow](#)  
Susana Goggi, [Iowa Seed Association Honorary Membership Award](#)  
Steve Mickelson, [Association of Technology, Management and Applied Engineering Faculty Excellence Award](#)  
Ken Moore, [American Society of Agronomy Carl Sprengel Agronomic Research Award](#)

## University Promotions

### Promoted to Professor:

Erin Hodgson, entomology  
Leonor Leandro, plant pathology and microbiology  
Danny Singh, agronomy

## Upcoming Events

- Wednesdays at noon, hosted online by ISU - [Weekly Iowa Learning Farms Webinars](#)
- July 30, 2020, hosted online by ISU - [Crop Scouting Competition for Iowa Youth 2020](#)
- August, Soybean Month in Iowa

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[ISRC@iastate.edu](mailto:ISRC@iastate.edu)

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