IOWA STATE UNIVERSITY

Iowa Soybean Research Center

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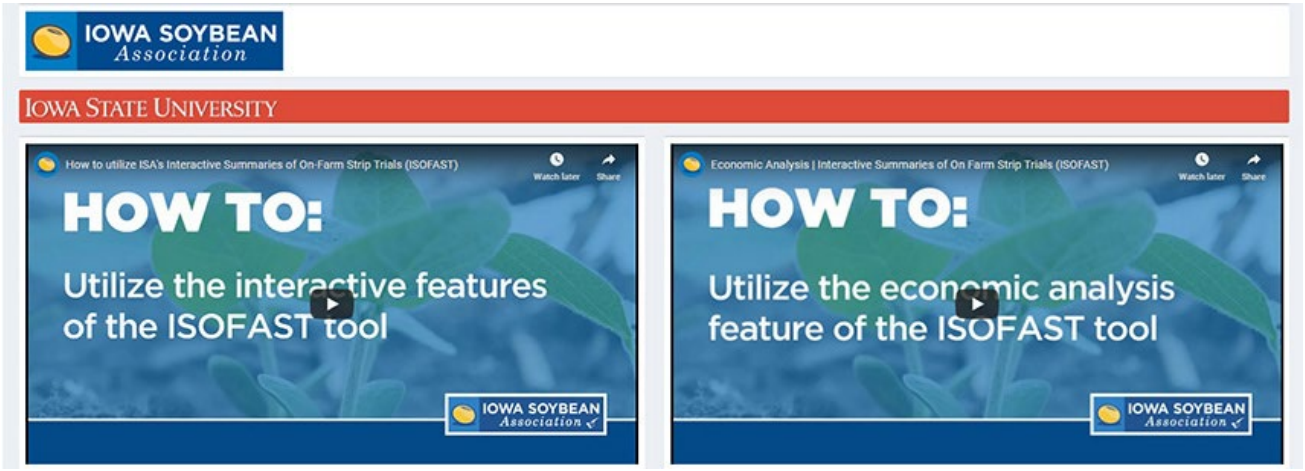
Iowa State/ISA Researchers Awarded Federal Grant



Above: The ISOFAST online tool will be expanded as part of "FACT: Web-Based Dynamic Data-Analytics Framework for On-Farm Research Networks." The tool will be hosted on the Iowa Soybean Association's website.

Peter Kyveryga

Fernando Miguez

The researchers who teamed up to bring us ISOFAST (Interactive Summaries of On-Farm Strip Trials Tool) have received two-year funding via a U.S. Department of Agriculture National Institute of Food and Agriculture (USDA-NIFA) grant for a new project titled "FACT: Web-Based Dynamic Data-Analytics Framework for On-Farm Research Networks." Building upon ISOFAST, which received funding from the ISRC, the FACT (Food and Agriculture Cyber Technologies initiative) project will help to share and provide unbiased accessible analyses of agricultural research data. Grants from USDA-NIFA are extremely competitive and are awarded to projects that focus on innovations in big data and artificial intelligence for better decision making by farmers and agronomists.

ISRC affiliates Fernando Miguez, associate professor of agronomy, Iowa State University and Peter Kyveryga, senior research scientist-analytics, Iowa Soybean Association are working to create a data repository for existing results from field-scale replicated on-farm trials on nitrogen (N) management collected by farmer networks across several states in the Corn Belt, from Ohio

to Iowa. This database will include over 6,500 individual field assessments. The most valuable information for users will be generated by pairing this repository with a web-based, publicly available, interactive graphical summary based on analyses of the repository data.

The goal is to establish the first farmer-led data repository in the U.S. for on-farm agronomic research. The repository, which will be managed by the Iowa Soybean Association, will contain field management information, corresponding spatial soil and rainfall data, laboratory soil or plant tissue analyses, as well as aerial imagery from 2006 to the present. The secure user interface will include summarization and filtering features such as the ability to select data from trials or surveys based on year, state or landform region, form of N fertilizer used, N rate range or application timing, cover crops usage and crop sequence and will have download capabilities.

According to Miguez, “Farmers value research conducted at commercial farms because it mimics the conditions under which they operate and thus are perceived as being realistic and relevant. This project will bring the results from a great set of on-farm management practices, including nutrient management, to an easily accessible web format. The challenge is that you never get the same outcome twice, so results are expected to vary greatly. For this reason, we are working towards using the best analytical methods and communicating this uncertainty in a transparent and accurate manner. Our hope is that this will lead to improved decision making by all stakeholders.”

Tune in to Iowa State Extension’s CropsTV

Iowa State Extension and Outreach is offering CropsTV, a 10-week, 45-episode series aimed at delivering crop production information directly to farmers and agribusinesses. CropsTV was created due to the ongoing pandemic and in lieu of the Integrated Crop Management Conference typically held in late November or early December and the Extension Crop Advantage Series meetings usually held in January.

CropsTV started in December and continues through February 4, but it is not too late to sign up. Episodes may be viewed live or on-demand, so for those getting a late start, there is still time to go back and watch previously aired episodes. Cost is $45 for a season pass and continuing education credits are available. A wide variety of subjects are presented by Iowa State faculty, staff and invited guests. The series is sponsored by the Iowa Soybean Association and the Iowa Corn Growers Association.

Several ISRC affiliates have been or will be participating. Catch entomologist Erin Hodgson’s soybean pest update, plant pathologist Daren Mueller’s soybean disease update and others available in the on-demand viewing library. Upcoming presentations will include Northwest Iowa on-farm and research farm results, Iowa State on-farm demonstration trial results and much more. For a complete list of programs, visit the Iowa State Extension CropsTV website.

UMN Offers Farming Series: Let's talk crops!

The University of Minnesota is offering a free webinar series called "Let's talk crops!" This Strategic Farming 12-part series will provide up-to-date, research-based information to help optimize crop management strategies for 2021. Sessions run every Wednesday, 8:30 to 9:00 a.m., January 6 to March 24.

The informal, online sessions are open to anyone interested. Each session will start with a brief presentation (about 10 minutes), followed by 20 minutes of discussion.

The session on March 17, titled "SCN: So Tough a Threat, it Warrants a Coalition," features SCN Coalition members: ISRC Director and Iowa State nematologist Greg Tylka, North Dakota State University plant pathologist Sam Markell and University of Minnesota agronomist Seth Naeve. Learn why soybean cyst nematode is such a threat to soybean production and how the coalition is helping producers fight back.

To view a schedule and to register, visit the University of Minnesota Extension website.

Iowa State Researchers Funded by NCSRP

The North Central Soybean Research Program (NCSRP) approved funding for close to $3 million for fiscal year 2021 for ten university-based projects. The following Iowa State researchers are involved in six of those projects.

- **Thomas Baum** and **Greg Tylka**, plant pathology and microbiology and **Andrew Severin**, biotechnology, will serve as co-principal investigators (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 II)"

- **Erin Hodgson** and **Matthew O'Neal**, entomology, will serve as co-PIs with others in a project led by Kelley Tilmon, The Ohio State University, titled "Soybean Entomology Research and Extension in the North Central Region"

- **Daren Mueller**, plant pathology and microbiology, will serve as lead PI with several other co-PIs for a project titled "Developing an Integrated Management and Communication Plan for Soybean Sudden Death Syndrome"

- **Daren Mueller**, plant pathology and microbiology, will serve as a co-PI with others on a project led by Damon Smith, University of Wisconsin, titled “Multi-pronged Strategies to Provide Efficient, Sustainable, and Durable Control of Sclerotinia Stem Rot - Year 3”

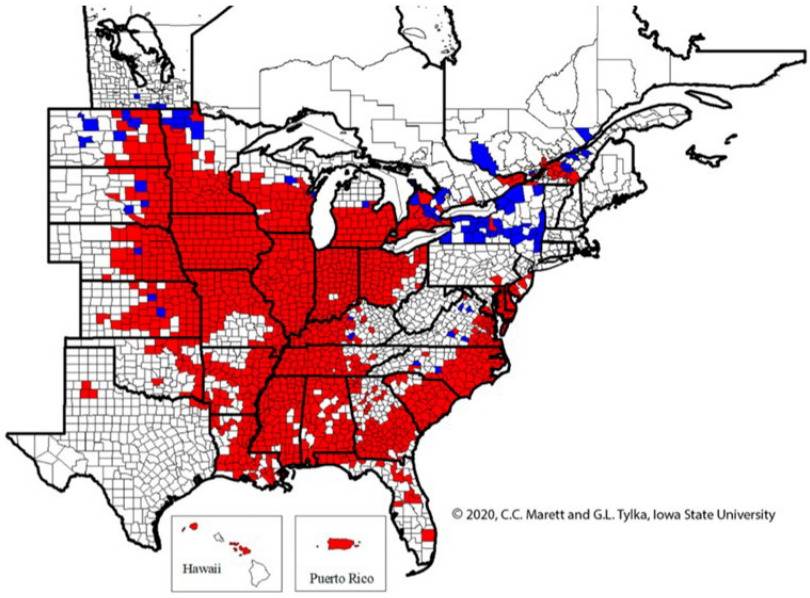
- **Danny Singh**, agronomy, will serve as co-PI with others on a project led by Leah McHale, The Ohio State University, titled “SOYGEN2: Increasing Soybean Genetic Gain for Yield and Seed Composition by Developing Tools, Know-how and Community Among Public Breeders in the North Central US” (*This project will also receive funding from USB)*

- **Greg Tylka**, plant pathology and microbiology, will serve as a co-PI with others on a project led by Sam Markell, North Dakota State University, titled “The SCN Coalition: 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.

SCN Continues to Spread in the U.S. and Canada

In 2020, plant health professionals in the U.S. and Canada were surveyed by Iowa State to identify counties infested with the soybean cyst nematode (SCN) since 2017. A similar survey was conducted in 2017 for the years 2014 to 2017. There were 55 new U.S. counties in 11 states and 24 counties and rural municipalities in Manitoba, Ontario and Quebec in which SCN was first discovered between 2017 and 2020. The results reveal steady expansion of SCN throughout the U.S. and Canada and underscore the need for scouting and soil sampling fields for detection of new SCN infestations.



Known distribution of SCN, in counties and rural municipalities in the U.S. and Canada in 2020. Newly infested areas are shown in blue; areas infested in 2017 or before are in red.

Greg Tylka and Christopher Marett, plant pathology, Iowa State University, conducted the survey and recently published the results in Plant Health Progress.

Get to Know ISRC Industry Rep: Julia Daum, BASF

Julia Daum, a nematologist and senior program leader in trait research for BASF, is one of nine industry representatives on the ISRC's Industry Advisory Council (IAC). She is also one of the longest serving members of the council. She is part of BASF's U.S.-based Trait Research team located in North Carolina, which works to discover and evaluate novel leads for their potential to become superior agricultural products that protect crops and improve yield. "I work with global project teams in advancing potential products from research through field testing to market acceptance, ultimately to provide improved options for our farmers for better pest and weed control," said Daum.

Julia Daum

"It's a privilege to have the opportunity to represent BASF on the IAC. BASF is committed to supporting innovative research, finding high value in opportunities to partner with organizations like the Iowa Soybean Research Center," said Daum. "The research project proposals submitted each year are innovative and of such high quality. It's exciting to be part of the process that selects and supports the projects that are so important for soybean growers and future sustainability."

Originally, from Fort Dodge, Iowa, Daum grew up detasseling corn and weeding beans. She graduated from Iowa State with BS and MS degrees in Food Technology. Her first job was as a lab technician/coordinator working on *Ascaris suum*, a parasitic nematode found in pig intestines. This experience led her back to school where she earned her PhD in biology with emphasis in nematology and biochemistry from the University of Toledo.

With over 35 years of scientific research experience, Daum says her professional life has been quite varied, but always interesting. Her knowledge and contribution in the area of soybean nematode control began with biotech company Athenix, then with Bayer (following the acquisition of Athenix by Bayer in 2009) and continues now with BASF (following the acquisition of her division by BASF from Bayer). "My overall goal in each of my career adventures has always been to contribute to society and to make a positive impact where I can, which is now described as sustainability, to help make this world a better place," said Daum.

Researcher Spotlight: Sotirios Archontoulis

ISRC affiliate Sotirios Archontoulis is an associate professor of integrated cropping systems in agronomy at Iowa State University. His areas of expertise include corn and soybean management, biomass crops, cover crops, modeling and decision support tools. He investigates practices that have the potential to improve the production and environmental performance of various cropping systems. His approach combines field experimentation and the use of process-based mechanistic simulation models.


Sotirios Archontoulis

Archontoulis was involved in one of the very first research projects funded by the ISRC in 2015 in which he and fellow

Iowa State researchers created the Soybean Planting Decision Tool. The support tool helps farmers better understand how planting date and maturity can interact with geographical location to affect soybean yield and crop staging with the goal of improving soybean yields.

In fall 2020, he was part of an Iowa State Agronomy team that debuted a new tool, the FACTS website (Forecast and Assessment of Cropping Systems), which displays weather summaries for every crop reporting district in 12 Midwest states. The summaries include data from 1984 through today, updated every month and with information on temperature, precipitation, radiation and other weather indicators. This tool is the product of collaborative work between Archontoulis and the Patrick Schnable lab, agronomy, and funded by the Plant Sciences Institute at Iowa State.

Archontoulis is a graduate of the University of Thessaly, Greece and he earned his MS and PhD at Wageningen University, Netherlands. He joined the faculty at Iowa State in 2014, explaining that he wanted to be "where the action is" for an agronomist.

Iowa State Researchers Involved in USB-funded projects

The United Soybean Board (USB) approved 176 checkoff-funded projects for 2021, of which Iowa State University is involved in 15. Following is the list of projects led by or involving Iowa State researchers.

- **Madan Bhattacharyya**, agronomy, will serve as lead PI on a project titled "Identification of High Yielding Sudden Death Syndrome and Phytophthora Resistant Soybean Lines and Molecular Markers for Improving Disease Resistance in Soybean"

- **Eric Cochran**, chemical and biological engineering, will serve as lead PI for a project titled "Market Development of Poly (Acrylated Epoxidized High Oleic Soybean Oil) Asphalt Modifier and Partially Epoxidized (High Oleic) Soybean Oil Rejuvenators"

- **Bob Hartzler and Prashant Jha**, agronomy, will serve as co-PIs on a project led by Bill Johnson, Purdue University, titled "Take Action - Multi State Herbicide Resistant Crops and Weeds Educational Program"

- **Prashant Jha**, agronomy, will serve as a co-PI on a project led by Bryan Young, Purdue University, titled "Integrating Best Management Practices for Herbicide-Resistant Weeds and Herbicide Stewardship in Soybean Production"

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

- **Leonor Leandro, Gary Munkvold and Alison Robertson**, plant pathology and microbiology, will serve as co-PIs on a project led by Jason Bond, Southern Illinois University, titled "Seedling Diseases of Soybean: Management and Education"

- **Daren Mueller**, plant pathology and microbiology, will serve as lead PI for a project titled "Crop Protection Network: A Collaborative National Resource to Deliver Soybean Research Results to Farmers"

- **Daren Mueller**, plant pathology and microbiology, will serve as a co-PI on a project led by Tessie Wilkerson, Mississippi State University, titled “Screening and Breeding Soybeans for Resistance to Mature Soybean Seed Damage”

- **Daren Mueller**, plant pathology and microbiology, will serve as a co-PI on a project led by Ahmad Fakhoury, Southern Illinois University, titled “Developing and Disseminating a Comprehensive and Sustainable Management Program for Foliar Diseases of Soybean”

- **Alison Robertson**, plant pathology and microbiology, will serve as a co-PI on a project led by Anne Dorrance, The Ohio State University, titled “Developing the Perfect Molecular Markers and New Germplasm for Rapid Incorporation of Resistance to Soil Borne Pathogens of Soybean”

- **Danny Singh**, agronomy, will serve as a co-PI on a project led by Zenglu Li, University of Georgia, titled “Discovery and Deployment of Novel Soybean Genes for Durable Resistance to Multiple Nematode Populations”

- **Danny Singh**, agronomy, will serve as a co-PI on a project led by Rouf Mian, USDA/ARS, titled “Discover Sources, Genes, and Develop New Varieties and Germplasm with Improved Meal Protein and Amino Acids Utilizing Diversity in Cultivated and Wild Soybeans”

- **Danny Singh**, agronomy, will serve as a co-PI on a project led by Ben Fallon, USDA/ARS, titled “Drought Resiliency for the Farm – Yield Limitations of Commercial Soybean Varieties under Drought: Identifying and Overcoming Weaknesses via ‘Team Drought’s’ Public Breeding Pipeline”

- **Greg Tylka**, plant pathology and microbiology, will serve as a co-PI on a project led by Carl Bradley, University of Kentucky, titled “SCN Coalition: Reinforcing and Maintaining Local Efforts and Sustainable Yields”

- **Greg Tylka**, plant pathology and microbiology, will serve as a co-PI on a project led by Sam Markell, North Dakota State University, titled “Determination of Impact, Return on Investment for the SCN Coalition, and Future Planning for the SCN Coalition and the National Soybean Nematode Strategic Plan”

Upcoming Events

- Wednesdays at noon - Weekly Iowa Learning Farms Webinars
- Now-Feb. 4, $45 registration - CropsTV – ISU Extension
- Now-March 24, free registration - UMN Let's Talk Crops! 2021 Webinar Series

Special thanks to Dr. Keith and Virginia Smith
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