IOWA STATE UNIVERSITY
Iowa Soybean Research Center

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Soybean Centers Discuss Gaps in Research

The Soybean Centers Coordination Group met in November 2019 in St. Louis, MO, to brainstorm about ideas and topics of interest as well as to discuss gaps in soybean research and identify training needs. The coordination group is made up of university and state soybean association personnel from Iowa, Illinois, Indiana, Kentucky, Missouri and Ohio.

The group identified a list of topics including use of emerging technologies with soybean, engaging younger producers, creating an “Agronomy Boot Camp” to reintroduce farmers to extension and training the next generation of researchers.

Four specific ideas for potential grant proposals emerged:

The Soybean Centers Coordination Group met to discuss areas of interest for future research. In the top photo from left are Jason Bond, Southern Illinois University; Becky Kinder, Kentucky Soybean Board; Katy Rainey, Purdue University; Ed Anderson, Iowa Soybean Association; and Jill Cornelis and Greg Tylka, Iowa Soybean Research Center. In the bottom photo from left are Ariel Kittle, Indiana Soybean Alliance; Megan Miller, Illinois Soybean Association; Anne Dorrance, The Ohio State University; and Chad Lee, University of Kentucky.

- Identifying the best remote sensing technologies for targeted management of soybean
- Creating soybeans with high yields plus double the protein
- Strengthening international partnerships for soybean production training and research
- Improving soil health for sustainable soybean production

The coordination group met in December and January via conference call to identify principal investigators and began working on the proposals. The group will meet again in the coming months. This meeting and future meetings (two to three times per year) are funded by the United Soybean Board to foster development of collaborative projects.

Iowa State Researcher Awarded USDA Grant

Iowa State University Professor of Plant Pathology and Microbiology Gwyn Beattie was recently awarded a three-year, $750,000 grant from the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) for an in-depth study of how microbial communities on roots can help plants and in particular, soybeans, survive and thrive in drought conditions.

Earlier in 2019, Beattie and Danny Singh, an associate professor of agronomy at Iowa State, wrapped up a three-year study of root microbiomes and root phenotyping funded by the Iowa Soybean Research Center. Microbiomes are collections of microorganisms (such as bacteria, fungi, nematodes and other microbes) found in particular environments. Outcomes of this study included the development of new ways to study and improve root traits through plant breeding efforts and knowledge of how roots influence microbiome development throughout the growth of the plant. The long-term goal of the study was to use root traits and root-microbiome interactions to optimize soybean growth and stress tolerance.

"We are thrilled to see Dr. Beattie's research receive federal funding from USDA NIFA," said Greg Tylka, director of the Iowa Soybean Research Center. "We are also proud that the ISRC funded some of Dr. Beattie's initial work with soybeans and the microbiome.

Beattie and her team will expand and capitalize on their knowledge of soybean root microbiomes to identify the mechanisms by which roots encourage beneficial microbiomes. They are focusing on benefits in the form of enhanced drought tolerance. Ultimately, by linking plant traits associated with stress tolerance to microbiome traits under drought conditions, Beattie's research could help direct plant breeding targets to favor potentially beneficial microbes that could make crops more drought hardy.

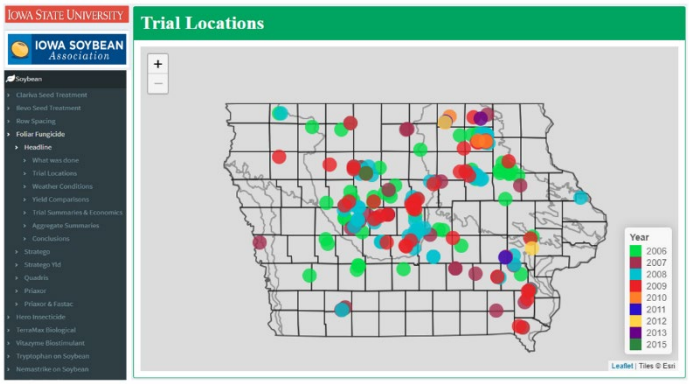
For a more in-depth look at Beattie's proposal, visit https://portal.nifa.usda.gov/web/crisprojectpages/1018797-mechanistic-drivers-shaping-root-microbiomes-and-microbiome-drivers-of-fitness-benefits-in-drought-stressed-plants.html.

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 and the center's industry partners. Below is information on the ISOFAST project that received funding and support from the center during fiscal years 2018-2019.

Iowa State, Iowa Soybean Association Offer New Way to View On-Farm Research Data

By Ann Robinson, CALS Communication Service



Locations of soybean foliar fungicide on-farm trials (2006-2015) that are part of the new Iowa Soybean Association ISOFAST online Tool. *Image courtesy of the Iowa Soybean Association.*

Iowa State University and the Iowa Soybean Association teamed up to develop a new, web-based resource as an easy-to-use portal where producers can find the results of hundreds of on-farm research trials conducted by the association's On-Farm Network. The Interactive Summaries of On-Farm Strip Trials, or ISOFAST, makes data mining easy for farmers, researchers and others interested in accessing detailed information from the organization's independent tests of products and practices.

"This tool is exciting for its potential as a framework to collect, analyze and present lots of high-quality data in a way we think will be coherent and meaningful for decision-making," said Fernando Miguez, associate professor of agronomy at Iowa State, with expertise in crop modeling and data analysis tools. Miguez and agronomy graduate student Anabelle Laurent spent much of the last three years working on ISOFAST with Peter Kyveryga, Iowa Soybean Association director of analytics and affiliate assistant professor of agronomy at Iowa State, and Suzanne Fey, Iowa Soybean Association data analyst.

"This project is a great example of scientists from Iowa State University and the Iowa Soybean Association working together, with support from both organizations, to develop and deliver research-based information and tools to help Iowa soybean farmers be more productive and profitable," said Greg Tylka, director of the Iowa Soybean Research Center and a professor of plant pathology and microbiology at Iowa State. The center provided funding to help launch ISOFAST.

The tool provides results of research on plant nutrition, disease management, weed and pest control products and crop management practices, such as plant population, tillage or row spacing. It also allows interactive economic analyses using cost and price inputs provided by users.

The idea for ISOFAST originated several years ago, said Kyveryga. ISA had been collecting trial data for about 15 years and had a large database of individual trial reports. "But we realized that the information was not that easy to find and lacked summary information for different categories," he said. "We started looking at how to best analyze and summarize the information to make it more useful to both farmers and researchers. Our farmers were very interested and wanted the information online."

ISOFAST summarizes historical data from on-farm replicated strip trials, showing locations by county. The tool provides study rationale, field management specifics, key scouting and soil and tissue observations, weather data and more. Viewers can create their own tailored reports. Options include dynamic graphics that visually communicate statistical summaries of trial results, comparing treatment yield differences within and across trials. Farmers are likely to be especially interested in an economic analysis feature that allows them to enter product or practice application costs and different grain prices, said Kyveryga. "This allows them to calculate a break-even yield response and see the probable cost-effectiveness of an application or treatment."

Register Now: ISA Research & Results Forums

The Iowa Soybean Association research team will be hosting Research & Results Forums on Tuesdays in February. Hear from ISA researchers as they link agronomy, production, conservation and analytics to help farmers be more profitable. Attendees can participate in roundtable conversations with fellow farmers to address concerns and challenges.

Forums will be held Feb. 4 (Buena Vista College, Storm Lake), Feb. 11 (AgriVision Equipment, Red Oak), Feb. 18 (Hills Bank, Washington) and Feb. 25 (FFA Enrichment Center in Ankeny). Each forum will run from 8:30 a.m. to 3 p.m.

Visit the Iowa Soybean Association website to register for a session near you.

ISU Extension Crop Advantage Series

ISU Extension is holding a series of Crop Advantage meetings in January. For more information on meeting dates and locations, see the map at left and register at www.aep.iastate.edu/cas/index.html.

The meetings provide a foundation of current, research-based crop production information to help farmers make smart, informed decisions in farming operations. For a list of specific topics and agendas by location, see http://www.aep.iastate.edu/cas/brochure.pdf. The meetings are supported by the Iowa Soybean Association and the Iowa Corn Growers Association.

Crop Advantage meetings are also approved for Iowa private pesticide applicators recertification and for continuing education credits, depending on workshop sessions attended.

Soy Asphalt Project Featured at ISU

In above photo is the Iowa State University biopolymer demo that took place at the National Center for Asphalt Technology Test Track at Auburn University.
Photo courtesy of ISU.

In November, Iowa State engineering professors Christopher Williams and Eric Cochran featured their work in developing biopolymers using high oleic soybean oil for asphalt production by paving the BioCentury Research Farm parking lot near Boone. The biopolymer asphalt formulation replaces other expensive, highly volatile compounds used as a binder in the creation of asphalt products with high oleic soybean oil.

This new type of asphalt is much cheaper than its counterpart, as well as being more durable and environmentally friendly. It could be as much as $3,000 cheaper per lane mile than traditional asphalts.

The new product must undergo testing before it can be used commercially, but its performance looks promising so far. The biopolymer asphalt has been used in various projects across Iowa and in other states. The State of Iowa and United Soybean Board checkoff dollars helped fund the project. For more information, see the article in the November issue of the Iowa Soybean Review.

ISU Group Tours Syngenta Seedcare Institute

In above photo, Iowa State students, faculty and staff pose with Syngenta Seedcare Institute staff. In photo below from left, ISU Plant Pathology and Microbiology graduate students EB Wlezien, Monica Pennewitt, and Elizabeth Carino, talk with Augie Beeman, Seedcare Tech Lead for the Syngenta Seedcare Institute and ISU Plant Pathology and Microbiology alum.

The Iowa Soybean Research Center along with ISU's Seed Science Center co-sponsored a fall tour to the Syngenta Seedcare Institute in Stanton, MN, on October 18. Twenty-two researchers, students and staff from Iowa State University took part in the tour, including students of Gary Munkvold's graduate-level seed pathology class and of Susana Goggi's agronomy and seed science courses.

Ravi Ramachandran, Head of the Syngenta Seedcare Institute North America, met with the group and gave an overview of the research being done at Syngenta, which included a broad portfolio of work in the areas of disease, insects, SCN and fungi with a focus on products, application and services. Ramachandran explained the importance Syngenta researchers place on learning from nature, which is imitated in their studies by using climate simulation chambers.

The group then toured several areas of the institute including the formulation, application, plantability, and seed biology laboratories. The tour focused on how seed treatment formulas and applications are created and tested, showing the importance and intricacies of their formulation technology and testing.

An article about the tour also appeared in Wallaces Farmer.

ICM Conference Features Several ISRC Affiliates

Iowa State University hosted the 31st Integrated Crop Management Conference on December 4-5, 2019. Over 900 people attended the conference, which aids those in the agriculture community in making smart, informed decisions based on the latest research and developing technology. Experts covered a variety of topics over 39 sessions including more than a dozen Iowa State researchers affiliated with the Iowa Soybean Research Center. Topics included crop, pest, nutrient, and soil and water management.

Daren Mueller, associate professor of plant pathology and microbiology and ISRC affiliate, gives a "2019 Soybean Disease Update" during the Integrated Crop Management Conference at ISU in December.

Of particular interest was a session on soybean gall midge presented by Justin McMechan, assistant professor and crop protection and cropping systems specialist at the University of Nebraska. This new insect species affecting several Midwest states, including Iowa, is cause for concern as infested fields experienced 17-31% yield loss in 2018. After one year of study, scientists have learned that gall midge has two alternate hosts to soybean: sweet clover and alfalfa; that there are three adult generations per year; and that planting time and white mold have correlations with infestations of the insect. According to McMechan, “Management at this point is difficult and there’s no silver bullet for complete control.” Stay-tuned, as researchers are only in the beginning stages of investigating this soybean pest.

Some other soybean-related takeaways from the event, noted by ISRC staff include:

Peter Kyveryga and Suzanne Fey, data analysts from the Iowa Soybean Association, gave a presentation on the ISOFAST (Interactive Summaries of On-Farm Strip Trials) tool. See article earlier in this newsletter for more information on ISOFAST.

Prashant Jha, associate professor and Iowa State Extension weed specialist, discussed weed management and emphasized the importance of land stewardship and using technology properly.

Mike Witt, Iowa State Extension field agronomist, discussed the continuing problem of weed resistance and how the Iowa Pest Resistance Management Program (IPRMP) will be focusing on the use of cover crops, herbicides and fungicide screening.

Greg Tylka, ISRC director and professor of plant pathology and microbiology at Iowa State, discussed Iowa State research on the effect of cover crops on soybean cyst nematode (SCN). Thus far no impacts of cover crops on SCN have been detected in ISU field experiments.

Information on this year's presentations can be found on the Extension website under Proceedings of the 31st Annual Integrated Crop Management Conference. Be sure to mark your calendars for next year’s conference, which will be held December 2-3, 2020.

SoyFest Coming August 2020 - Volunteers Needed

August is "Soybean Month" in Iowa and it is also the start of the fall semester at Iowa State University. So, ISRC staff decided, "What better time than August to host a fun and educational experience on all things soy at ISU?" The inaugural SoyFest will be held from 10 a.m. to 2 p.m., August 26, 2020, on central campus south of Parks Library. The event will show how soy products have become part of everyday life, the many uses of soy, and emerging soy products. The ISRC hopes to engage many of the 35,000 plus students on campus and the public is welcome to attend.

SoyFest

A celebration of soy!

The celebration of soy will feature a free cookout and soy-related snacks as well as cooking and robotic demonstrations, soy products, a photo booth, carnival games, and more!

The ISRC is looking for product donations, sponsors and participants. Approximately 16 10x10 tents will be provided to those wanting to have a booth at the event. Soy-related giveaways, samples, games and displays are encouraged! Several student groups and local businesses have already committed to helping with the event, including the Iowa Soybean Association, the Iowa Food & Family Project, West Ames HyVee, and various student groups at Iowa State.

If your organization would like to participate as a sponsor, please contact the ISRC by email at ISRC@iastate.edu or by calling 515-294-7318.

New ISU Extension Soybean Publications Available

The following publications are now available via the Iowa State Extension website:

- Evaluation of Soybean Varieties Resistant to Soybean Cyst Nematode in Iowa – 2019 by Greg Tylka, Greg Gebhart, Christopher Marett and Mark Mullaney
- 2019 Yellow Book for Soybean Aphid by Erin Hodgson
- Proceedings of the 31st Annual Integrated Crop Management Conference

For these and other ISU Extension agricultural publications, visit the Extension Store. Most PDF versions are free, while hard copy publications will have a fee.

Upcoming Events

- Jan. 3-30, 2020, across IA – ISU Extension Crop Advantage Series
- Jan. 28-30, 2020, Des Moines, IA - Iowa Power Farming Show
- Feb. 4,11,18, 25, across IA - ISA Research & Results Forums
- Feb. 25-26, 2020, Ames, IA – ISU Extension Soil Fertility and Nutrient Management Short Course
- Feb. 27-29, 2019, San Antonio, TX - Commodity Classic
- March 7, 2020, Ames, IA – ISU Field Crop Scout School

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