



United States Department of Agriculture

Research, Education, and Economics (REE) National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board Specialty Crop Committee (SCC)

HIGHLIGHTS OF THE SPECIALTY CROP COMMITTEE MEETING

January 19-20, 2022
Virtual Meeting Via Zoom

The Specialty Crop Committee (SCC) is a permanent, statutory committee responsible for studying the scope and effectiveness of research, extension, and economics programs affecting the specialty crop industry and provides consult on the procedures and objectives used to conduct the relevancy review and the scientific merit review of the Specialty Crop Research Initiative (SCRI) met in public session on January 19-20, 2022 via a virtual zoom meeting. The meeting's main goal on day #1 was to hear feedback on the United States Department of Agriculture's (USDA) National Institute of Food and Agriculture (NIFA) Specialty Crop Research Initiative (SCRI) grant projects awarded in 2021. Project Directors presented their projects that address the critical needs of the specialty crop industry supporting research and extension issues by addressing key challenges of national, regional, and multi-state importance in sustaining all components of food and agriculture, including conventional and organic food production systems. The main goal of meeting day #2 was to learn more about the SCRI program and its job to promote collaboration, open communication, the exchange of information, and the development of resources that accelerate application of scientific discovery and technology to solving needs of the various specialty crop industries. SCRI also works to give priority to projects that are multistate, multi-institutional, or trans-disciplinary, and include explicit mechanisms to communicate results to producers and the public.

Prior to this 2022 SSC meeting, the SSC met last on a conference call in 2019 and in-person on August 28-30, 2017 in Traverse City, MI. The main goals of the 2017 meeting were for the SCC members to conduct a tour of six locations to meet with specialty crop growers and others; to review draft recommendations regarding the Specialty Crop Research Initiative grants; and to discuss the SCRI Relevancy Review process.

SUMMARY OF PRESENTATIONS

On day #1 of the SSC meeting a total of 15 presentations given by SCRI grant project leaders. The first three presentations were 20 minutes in length, plus 10 minutes were given for questions and answers, the next eight presentations were five minutes in length for the presentations and five minutes in length for questions and answers, and the last four presentations were 10 minutes in length and 10 minutes in length for questions and answers.

Steven Knapp from University of California, Davis presentation entitled Next-Generation Disease Resistance Breeding & Management Solutions for Strawberry (September 1, 2017 – August 31, 2022). The project has five main objectives: #1: Understanding Economic Factors Affecting Stakeholders; #2: Strengthening Genome-Informed Breeding Platforms; #3: Developing & Deploying Disease Resistant Cultivars; #4: Predicting, Monitoring & Preventing Losses Caused by Plant Pathogens; and #5: Understanding Socioeconomic Factors Affecting Stakeholders. Dr. Knapp believes that the work with stakeholders needs improvement and has found that there are deep philosophical differences between scientist and stakeholders and that this tension could be felt in his project. On a positive note, what scientists can do with the strawberry over this past five years has really been transformative.

Joji Muramoto (with assistance from Erin Roskopf – focus on FL) from the University of California, Santa Cruz presented on “Integrating Anaerobic Soil Disinfestation, Crop Rotation and Variety for Disease Management in Strawberry Production”. The project involves five States across the country these five States combined cover combined cover 99% of the strawberry sales and production in the United States. Anaerobic Soil Disinfestation (ASD) was developed as alternative to methyl bromide in the Netherlands and in Japan independently in 2000. Dr. Muramoto presented the three steps of his project as follows: (1) Incorporate organic material; (2) Cover with oxygen impermeable tarp; and (3) Irrigate to saturation – Not Flooding – and maintain the fermentation process for three weeks. The projects overall aims are to (1) Improve the basic understanding of modes of action of ASD and environmental interactions; (2) Use this knowledge to design and test integrated management systems; (3) Work directly with strawberry growers who are testing and adopting the biological strategies.

Frank Louws, from North Carolina State University presentation was entitled “Growing New Roots:” Grafting to Enhance Resiliency In U.S. Vegetable Industries”. This grafting project also emerges from the methyl bromide loss and challenge. One of our key goals was made to make sure that we included a lot of our industry partners, and we had many up to 75 that they directly cooperated with. And they also worked with several international partners, most of them are robotic companies. They also brought on their team plant nursery experts, especially early in days of the project and they also worked very closely with their key stakeholders and growers. The project was partitioned off into five core areas. (1) Maximize Impacts of Grafting Technology; (2) Advance Root Genetics; (3) Increase Capacity & Efficiency; (4) Economic & Environmental Metrics; and (5) Adoption, Education & Evaluation. The presentation ended with looking toward the future as the grafting industry matures in the U.S. there will be an expansion

where rootstocks will be selected for cool seasons and hot seasons and different types of conditions that might be encountered and offer resilience to growers.

Andreas Westphal from the University of California, Riverside presented a project entitled “Putting Phenotypic and Genotypic Tools to Work for Improving Walnut Rootstocks”. The objectives of the project are as follows: (1) Propagation: Two breeding populations with resistance to Crown Gall (CG), Phytophthora (PHYT), Nematodes (NEM); (2) Phenotyping for biotic and abiotic stresses and determine their interactions; (3) Develop remote sensing techniques; (4) Genetics of breeding populations discovery of resistance loci, gene expression, pyramiding; (5) Economic analysis of rootstock use and examine stakeholder attitudes; and (6) On-farm rootstock trials in different agro-ecological environments rootstock release.

Jason A. Fischbach from the University of Wisconsin – Madison Extension presented a project entitled “Overcoming Obstacles to Hazelnut Production in the Upper Midwest”. The project is primarily a collaboration between the University of Minnesota and the University of Wisconsin along with many partners across the upper Midwest. Dr. Fischbach started his presentation with one question “Why Hazelnuts in the Upper Midwest?” And there are three answers; (1) the growers need their help; (2) woody perennials, especially the upper Midwest really have a role to play in solving many agricultural problems or research problems; and (3) there's a big economic opportunity that's continuing to develop as per capita consumption of hazelnuts is very low compared to other hazelnut producing regions. The project has four main objectives: (1) Develop improved germplasm based on endemic American hazelnut (*Corylus americana*); (2) Develop nursery stock supply chains for a highly recalcitrant species; (3) Develop production protocols for a novel hedgerow-based production system; and (4) Support supply chain and market development efforts.

Massimo Iorizzo from North Carolina State University project is entitled “VacciniumCAP: Leveraging Genetic and Genomic Resources to Enable Development of Blueberry and Cranberry Cultivars with Improved Fruit Quality Attributes”. The mission and objectives of the project are based on industry inputs that were collected between 2016 and 2018 through our planning grant funded by the USDA. The main challenge has been on the production side of blueberry and cranberry because they are inconsistent in quality which leads to a negative perception of the product which leads to less revenue and less competitive industry. The project's goal is to (1) Develop and implement phenotyping and DNA tools to accelerate development of new cultivars with improved fruit quality and (2) Increase production of fruits that meet consumer preferences and production/processing needs. There are five main objectives of the project: (1) Establish – DNA tools; (2) Discover – Link DNA to fruit quality; (3) Deliver – DNA markers; (4) Assess – link to fruit quality and fruit characteristics; and (5) Engage – Transfer deliverables.

Paula Agudelo from Clemson University's project is entitled "Focused Investigations on the Distribution and Management of *Meloidogyne Enterolobii*". This nematode is important to specialty crops because it is very aggressive. It causes severe galling in roots and below ground and it also reduces yield and reduces quality of product. In above ground symptoms, it can cause anything from stunting to death. What complicates the matter is that all the known resistance for other *Meloidogyne* species is not effective against this strain of *enterolobii*. So, all the advances that that have been made with other vegetables is not effective with *Meloidogyne enterolobii*. The goal of this project is to reduce the vulnerability of growers to *Meloidogyne Enterolobii* while it still has limited distribution and maybe think of ways, where they can contain the nematode but also develop management practices, so that they can manage it once it spreads. There are five objectives, (1) Nematode Distribution; (2) Plant Resistance; (3) Management; (4) Economics; and (5) Education.

Michelle Danyluk from the University of Florida presentation was entitled "CONTACT: Scientific Challenges and Cost-Effective Management of Risks Associated with Implementation of Produce Safety Regulations". The project's overall objective is to assess the health, economic and important risk impacts of food systems in consultation with the produce industry Regulators and a national network of extension specialists and world leaders and produce safety. The goal of the project is to identify important factors that drive food safety risks and produce safety and then to help the specialty crop industry to develop validated scientific support. The project also hopes to provide scientific and technological knowledge to develop metrics important to enhancing produce safety across the U.S. and to identify improved approaches and techniques that allow the attainment of metrics to be verified and cost effective. They we have seven objectives within our system that divide up between those and the Agricultural Systems and Stakeholder Engagement and Risk Management Tools.

Patricia Manosalva from the University of California, Riverside (UCR) presentation was entitled "Reducing Avocado Losses to Major Challenges by Improving Resistance Selection and Disease Management Using Next Generation Technologies". The purpose of the project is to increase the production and save the industry of avocados. The major challenges of the project are (1) *Phytophthora* Root Rot (PRR); (2) Laurel Wilt; and (3) Salinity. This project targets several short- and long-term goals. The short-term goals are (1) In-field pathogen diagnostic tools; (2) Registration of a new PRR fungicides (3) Release of five advanced UCR salinity and PRR resistant rootstocks. The long-term goals are (1) Selection of PRR resistant rootstocks; (2) Selection of resistant/tolerant LW rootstock: scion combinations; (3) Development of a remote sensor system for disease management; (4) Implementation of avocado genomics-assisting breeding platform. The project's objectives are (1) Assess *P. cinnamoni* (Pc) and *R. lauricola* (RI) variability; (2) Select *Phytophthora* root rot and Laurel Wilt resistant material; (3) Multi-state, semi-commercial, and release of five UCR advanced rootstocks (Spring 2022); and (4) Develop and deploy new tools to improve disease management; (5) Generate avocado genomics-

assisted breeding platform for future implementation of Manosalva and Bombarely (MAS); and (6) Facilitate the grower adoption of project outcomes by estimating their economic value and integrating research with extension, outreach, and education (all team members).

Markus Keller from Washington State University presented on “High-Resolution Vineyard Nutrient Management”. The project’s objective is to solve vineyard nutrient variability. Vineyards vary over space and time and the one-size-fits-all approach to fertilizer application is (1) economically inefficient (oversupply vs. undersupply) and (2) Detrimental to the environment (nutrient losses), you can see that in these two pictures. The project originated with the National Grape Research Alliance. The project has four focus groups to present a multi-disciplinary approach: (1) Sensors and Engineering; (2) Precision Management; (3) Plant Nutrition and Product Quality; and (4) Social Science and Extension.

Marc van Iersel from the University of Georgia presented “LAMP: Lighting Approaches to Maximize Profits”. The project is focused on the profits made to light-controlled environments in agriculture and the reason that matters is that providing lighting for agriculture is expensive both in the initial expense to buy these lighting systems, as well as the operating expense to pay for the electricity. The project has six different disciplines represented, (1) Horticulture/Plant Science; (2) Mechanical Engineering; (3) Electrical Engineering; (4) Agricultural Economics; (5) Management Information Systems and (6) Impact Assessment.

Carl Rosen from the University of Minnesota presented his project entitled” Enhancing Soil Health in U.S. Potato Cropping Systems: SCRI Project Update”. The project’s objectives are to improve soil health in potato cropping systems. Some key principles are (1) Keep soil covered; (2) Minimize soil disturbance; (3) Increase crop diversity; (4) Keep living roots in the soil; and (5) Integrate livestock. The four project objectives are (1) Evaluation of management practices that optimize soil health (small plots); (2) Determine spatial variation of on-farm soil health-based indicators associated with potato crop health, yield, and quality (grid-sampled fields); (3) Identify the incentives, impediments, and determinants of adopting practices and technologies that encourage practices to improve soil health in potato production (economics of soil health); and (4) Facilitate adoption of soil health best management practice systems by the potato industry (extension and outreach).

Carolee Bull from Penn State presented her project entitled “Integrated Management of Emerging Seedborne Bacterial Diseases of Cucurbits and Chenopods”. Seed can be infested and there are two different crops: the seed crop and seed industry are impacted and then the food crop where crop growers are impacted. The project’s objectives are as follows: (1) Develop specific methods for pathogen detection and quantification; (2) Development of novel Integrated Pest Management (IPM) practices for crop and seed production; (3) Develop seed testing protocols and treatments; (4) Identifying novel sources of disease resistance; and (5) Cost benefit analysis; and (6) International seed health extension. Training, and mentorship.

Julie Urban from Penn State presented her project is entitled “Biology, Management, and Reducing the Impact of the Spotted Lanternfly (SLF) on Specialty Crops in the Eastern USA”. The spotted lantern fly is an invasive insect from Asia, primarily from China. The SLF was first detected in eastern Pennsylvania in the fall of 2014, but it was an invasive passed in South Korea, starting in 2004. And in South Korea it did significant damage to tree fruit, stone fruit, and forest trees. The U.S. were on the lookout for SLF it wasn't until 2017 the populations blew up and that's when researchers realized it's going to be a significant problem so that's when this project started organizing. The objectives of the program are: (1) Quantify SLF impact on at-risk specialty crops and immediately develop management tactics to reduce the damage in areas where SLF are established; (2) Perform essential fundamental research on SLF basic biology, ecology, behavior and biological control tactics contributing to long-term sustainable solutions; and (3) Deliver immediate SLF management solutions to specialty crop stakeholders and the general public via the Extension networks of the partnering land grant universities, USDA agencies, and Northeastern IPM Center (NEIPMC).

Rebecca Grumet from Michigan State University presented “CucCAP2: Harnessing Genomic Resources for Disease Resistance and Management in Cucurbit Crops – Bringing the Tools to the Field”. This project involves crops produced in the United States there's including watermelon the different melons, cucumber and a surrogate squashes and pumpkins. Even though we're dealing with a variety of different crops that are grown all over the country under a range of environmental and climatic conditions consultation with industry (i.e., growers, shippers, and processors), regardless of the crop and location identified resistance to diseases as the highest priority for crop improvement. The project's objectives are to (1) Develop advanced bioinformatic, pan-genome and genetic mapping tools for cucurbits; (2) Utilize genomic approaches to identify, map, and develop markers for resistances to priority diseases identified by cucurbit industries; (3) Introduce and pyramid/stack resistances into advanced breeding lines; and (4) Provide state-of-the-art disease control recommendations, perform multi-location, multi-isolate trials of resistances to improve integrated disease management, assess economic impacts.

On day #2 of the SSC meeting Tom Bewick gave a presentation to the SCC on the history of the SCRI and the recent changes. The foundation of SCRI started back in 2001 with the Specialty Crop Competitiveness Act. In 2018 the Farm Bill's legislative focus areas expanded and authority to waive matching requirements was eliminated. And in 2018 funding was made available for two years. The current process of the SSC ensures that a relevancy review is completed at the pre-application process. Full applications are reviewed by a panel of scientific experts from academia, government and industry and the results of scientific merit reviews are combined with results of relevancy review to develop funding recommendations. Mr. Bewick spoke on the importance of specialty crop committee recommendations and if there is something that the SSC likes about what the SCRI is doing they can recommend continuing the process or suggest that the USDA change or add something.

KEY ISSUES AND DISCUSSIONS

Ms. Kate Lewis worked through what the SCC responsibilities are after having the day and a half meeting. The SCRI is looking for the SSC to provide any comments or questions or recommendations on the impact of the projects. Ms. Lewis noted that the SCRI already has pre-applications for FY22 and noted that they will be turned in on January 21, 2022. Ms. Megan O'Reilly stated that the recommendations from the SSC are more for 2023. Mr. Bewick added that the minutes will be circulated, and the committee will approve them, and the recommendations will then go to NIFA and therefore, its best to look into the future (FY23). If the SSC thinks that there are things that could be improved, it might be minor tweaks, or they may be more substantial those recommendations can be given at a date later TBD.

Ms. Lewis thanked everyone for a great discussion, but she admitted that she was still wrestling with what does the SSC committee walks away with. Ms. Lewis ensured the SSC members that they will be provided with all the information from the meeting (ppt slides and reference materials).

RESOLUTIONS AND RECOMMENDATIONS

- The SSC is to provide some comments back, however, general, or specific on the 15 presentations or the process. And the timing for these comments is TBD.
- Ms. Shirley Morgan-Jordan will send the recommendations from the 2017 Michigan SSC meeting as an example for the new SSC members.
- Ms. Lewis will update the SSC on the program status and process for 2022 and will keep the Committee engaged.