**NCERA 137 2022 Annual meeting – Lincoln, NE**

**June 20-21, 2022**

**Chair:** Daren Mueller – Iowa State University

**Secretary:** Alyssa Koehler – University of Delaware

**Attending:** Marty Draper, Daren Mueller, Kiersten Wise, Carl Bradley, Albert Tenuta, Alyssa Koehler, Kaitlyn Bissonnette, Tamra Jackson Ziems, Chris Little, Monica Pennewitt (grad student), EB Wlezien (grad student), Jacki Weiss (USB), Ed Sikora, Greg Tylka, Emmanuel Byamukama, Heather Kelly, Jennifer Riggs, Dylan Mangel, Rodrigo Onofre, Danielle Watts, Horacio Lopez-Nicora, Dean Malvick, Haddish Melakibyhan, Tim Todd. Online: Gary Bergstrom, Sara Thomas-Sharma, Ann MacGuidwin, Mandy Bish, Michaela McGinn, Darcy Telenko

**Monday June 20, 2022**

**1. Brief introductions around the room and online.**

**2. USB update – Jackie Weiss**

Overview of finance allocation 0.5 of 0.5 percent – half local, half national board, money comes from the farmers, 78 farmers on the board, 30+ state and regional boards. Basis of the strategic plan beginning Oct 1 for next 5 year direction “Supply – Plant Health & Nutrition – Investing in growing soybeans to meet the future needs of plant (and soil) health and nutrition.” 60% of funding is allocated in the “demand” areas, 40% of funding to “supply” area. More info coming out end of July/first week of Aug.

**3. Crop Protection Network Updates – Kiersten Wise**

Input from 195 specialists, 34 states and Ontario and Quebec. New CPN staff on board. Website redesign and launch in 2022. Web books released in 2021 – Fungicide Use in Field Crops, Tar Spot of Corn, Crop Scouting Basics for Corn and Soybean.

2021 metrics - 360,000 unique page views, 153,500 publication downloads, >20,500 times download for fungicide efficacy tables, virtual crop scout school, hosted 8 webinars with ASA >3,000 live attendees

Total downloads per crop: corn 42%, 43% soybean, 15% wheat. CEU credits for CCAs 3100+ quizzes in 2021. I See Dead Plants Podcast (7 of 15 in season 1 are soybean focused). Soybean disease loss estimates, severity estimation tool. CPN newsletter – 950 subscribers.

Expanding to new disciplines/crops – weed science, entomology, science for success.

**4. North Central IPM Center – Daren Mueller**

Facilitate intra- and inter-regional collaboration, Increase IPM community diversity, equity, and inclusion, Develop and sustain Signature Food Security Programs, Promote and Evaluate regional IPM activities. Can sign up to receive newsletter - The Central Issue. Pests and Progress Webinars – if you have a USDA CPPM or other USDA grants can give a summary or synopsis of your project.

Facilitating collaboration: working groups $200,000 set aside annually, ~$20,000 per group; $100,000 available for critical issues proposals, up to $50,000 per proposal – not a lot of plant pathology activity to date. Resources: DEI Coordinator, Communications, Program Manager, Graphic Design, Evaluation/Impact, Design Thinking

**5. SCN/SDS seed treatment summary – Kaitlyn Bissonnette**

Overview of multi-state project across 13 state and Ontario, CA – 51 site years. Looking to answer how SCN seed treatments compare across environment - Naked seed, base, Aveo, BioST, Clariva, ILEVO, Saltro, Trunemco. 4-6 reps, egg counts beginning and end of season, 30-35 day female counts, R5 SDS ratings, yield. Higher initial populations drove higher early season infection. No reduction in reproductive factors. No consistent across yield response, Saltro slightly better, but not connected with SCN reduction. SDS – low SCN, Saltro and ILEVO yielding better, medium SCN, Saltro and ILEVO yielding better, high SCN, all over the place consistency of treatments decline. Wide range of initial SCN population levels and environment.Discussion – GH experiments being presented later this week.

**6. Pattern Ag Update – Danielle Watts**

Founded in 2018 –Goal to turn complex biological metadata into intuitive actionable insights and recommendations. Predict pest & disease pressure (Corn rootworm, SCN, SDS, seedling disease and root rot); Enhance Biofertility and Soil Attributes; Promote Beneficial Microbes.

Vertically integrated metagenomics platform sequences soil at scale. Trying to create predictive analytics rather than diagnostic assessment. ID target species – whole genome sequencing, trying to define thresholds. Working on replacing SCN counts – results showed strong alignment with ISU PIDC counts in moderate and high pressure fields, tended to be more sensitive in the “low pressure” fields. High sensitivity and specificity, increased accuracy, scalable and cost effective. Pathogen clusters – SCN positive fields were also infected by Fusarium rots, SDS, Pythium rot. Example of 10 composite samples in 100 acre fields, each composite sample has 12-14 cores pulled evenly throughout zone, core depth 6”.

What’s next? Benchmarking regenerative practices, NUE via bacterial signatures (Nitrogen, Phosphors); Biological markers for high vigor by climate zone; SDS; expansion into Brazil, foliar/residue pathogen tests (tar spot, NCLB, GLS, Goss’s Wilt); corn nematodes (‘sharps’); cotton (RKN, reniform, wilts)

Interested in working together? Reach out [danielle@pattern.ag](mailto:danielle@pattern.ag)

**Tuesday June 21, 2022**

**Attending:** Marty Draper, Daren Mueller, Kiersten Wise, Carl Bradley, Albert Tenuta, Alyssa Koehler, Kaitlyn Bissonnette, Tamra Jackson Ziems, Chris Little, Monica Pennewitt (grad student), EB Wlezien (grad student), Jacki Weiss (USB), Ed Sikora, Greg Tylka, Emmanuel Byamukama, Heather Kelly, Jennifer Riggs, Dylan Mangel, Rodrigo Onofre, Danielle Watts, Horacio Lopez-Nicora, Dean Malvick, Haddish Melakibyhan, Tim Todd. Online: Gary Bergstrom, Allison Robertson, Ann MacGuidwin, Mandy Bish, Rubella Goswami, Sara Thomas-Sharma, Shahid Siddique

**1. USDA NIFA Update (Rubella Goswami and Emmanuel Byamukama)**

USDA and REE Leadership overview and updates. Molecular Plant Pathology NPL position to be advertised soon. Headquarters in Washington DC, operational headquarters in Kansas City, MO.

USDA Strategic Plan 2022- 2026, 6 strategic goals. Upgrades to the NIFA Reporting System, more navigable website, more navigable application process.

Emmanuel – National Program Leader, Crop Protection Division

AFRI programs 45% of funds, CPPM 2%, SCRI 8%, SBIR 2%, others 39%

Competitive funding opportunities:

-CPPM - Applied Research and Development Program Area ($200,000-325,000 per project, 2-3 years), application deadline was Feb 28, 2022 (runs annually), Research only, Research- led, Extension- led (33% success rate)

-AFRI CARE A1701 – should lead to readily and rapidly adoptable practices (up to $300,000, 1-3 years). Deadline Sept 25, 2022 (37% success rate)

-AFRI A112 Pests and Beneficial Species in Agricultural Production systems ($750,000 3-5 years), Deadline Aug 25, 2022 (17% success rate)

-AFRI A1101 Foundational Knowledge of Agricultural Production Systems ($300,000 - $750,000 3-5 yrs), Sept 15 deadline, (22% Success rate)

-AFRI A1181 Agricultural Biosecurity ($300,000-1,000,000, 3-5 yrs) Oct 20, 2022

-Methyl Bromide Transition program ($500,000, 2-3 yrs) was March 17, 2022

-NIFA Equipment Grant Program ($25,001-$500,000 up to 3 years) deadline was June 15, 2022

-Education and Workforce Development

-Pre and Postdoctoral fellowships, REEUs, k-14 training and continued education, workforce training grants

**2. SCN Coalition – Sam Markell**

Conducted national market research in 2015, launched in 2018 to increase awareness of SCN. 2020 let’s talk todes video files, end of July 2021 >31 million views – lead to more market research

Silver anvil, won the issues management category. Working on a plaque that will go to all Co-PIs.

Grants through check-off and private partnerships, upcoming National Soybean Nematode Conference Savannah, GA Dec 14-16, Advancing Nematode Research into the Future <https://www.apsnet.org/meetings/mtngwshops/SCN/2022Conference/Pages/default.aspx>

Proposals to NCSRP and USB currently under review.

Morgan Myers plans into late 2023, more market research in 2025

**3. Digital phenotyping and soybean breeding updates – Danny Singh**

Emphasis of the program is to develop field ready cultivars (high yield, good quality, tolerance to stresses, and lower need of input costs) – with greater applications of robotics and artificial intelligence.

Bulk populations – progeny rows – preliminary yield trials – advance yield trials – multi state trial – cultivar release, 8-10 years to get something to market.

Automated soybean pod counting using ground robotic platforms for yield estimation; drone based maturity rating; utilizing high resolution soil data for spatial adjustments, yield predictions; interpreting the impact of weather on yield; computer vision and machine learning enabled soybean root phenotyping pipeline; transition from manual to machine learning nodule quantification; water and heat stress phenotyping and breeding.

**4. Overview of machine learning applications in plant stress phenotyping – Arti Singh**

Plant-based protein crops breeding (mung bean, erd bean, field peas). Machine learning – 2014 engineers were working along, sample size was too small – work to bridge this. Identification of 8 stresses (bacterial blight, bacterial pustule, brown spot, herbicide injury, SDS, Frogeye, Iron Deficiency, Potassium deficiency). Hyperspectral camera for charcoal rot phenotyping; deep learning framework to discern and count SCN eggs; deep learning-based phenotyping for GWAS studies of SDS in Soybean; UAV and robotics; 2021 Fall Armyworm outbreak in alfalfa; closing sensing, modeling and actuation loop; fine grained visual categorization of insect pest, web-app interface for insect pest classification.

**5. Design Thinking Workshop**

What is Design Thinking?

Empathize (understand the problem) – Define (set your goals) – Ideate (how do you achieve your goals) – prototype (make, make, make) – Test (does it work?) It is a non-linear process to reveal what is needed

What does design thinking look like for CPN?

-Short and long term goals for CPN, what has/hasn’t worked?

-Brand is not a logo, brand is a system.

-What does this brand do? Tell a story. Allow room for a growing outreach. Create a fun and playful voice

-How to we tell this story? – create a mood board

-“The Future of Crop Science” – logo creation

Ice Breaker – 50 uses for a brick

5 cards x 5 prompts x 5 answers x 5 minutes: CPN is, CPN is not, CPN should be, CPN could be, I care because

**Business Meeting**

Updates from Marty – Thank you for meeting with NC1197. Good to meet in a different location for the year. Jeff Jacobson is retiring, need to find a replacement – looking for a seasoned administrator, position is around 50% travel. In president’s budget request, full funding to level of AFRI money. House ag appropriation committee was meeting last week, should hear updates soon. Last year wrote a nomination for excellence in multistate – not the national choice, but there are certificates from last year 2021 North Central Nomination. Re-nominated for 2022 and again selected by North Central Region. If the group is a recipient of a national award, there is $10,000 to use for future committee work.

Open for nominations – Febina Mathew

All in favor, no opposition

Meeting location – Pensacola in alignment with 2023 SSDW meeting

Motion to end business meeting Heather Kelly, 2nd Daren Mueller