**2019-20 NCERA-184 Meeting Minutes**

Chair: Heather Kelly – University of Tennessee

Secretary: Alyssa Koehler – University of Delaware

Attendees:

Daren Mueller – Iowa State University

Albert Tenuta – OMAFRA

Shaukat Ali – South Dakota State University

Martin Nagelkirk – Michigan State University

Gary Bergstrom – Cornell University

Andrew Friskop – North Dakota State University

Rachel Guyer – University of Tennessee

Tom Allen – Mississippi State University

Trey Price – Louisiana State University

Alyssa Koehler – University of Delaware

Kaitlyn Bissonnette – University of Missouri

Darcy Telenko – Purdue University

Carl Bradley – University of Kentucky

Heather Kelly – University Tennessee

Damon Smith – University of Wisconsin

Terry Spurlock – University of Arkansas

Dan McDonald – Phenotype Screening

Navjot Kaur – Virginia Tech

Zoom Attendees:

Nathan Kleczewski – University of Illinois

Ken Obasa – Texas A&M

Alfredo Martinez- University of Georgia

Joe LaForrest – University of Georgia

Jessica Rupp – Kansas State

Kendall Lamkey – Iowa State, Administrator

Christina Hagerty – Oregon State University

1. **Brief Introductions of individuals**
2. **Kendall Lamkey - Administrator Update**

Thank you to Heather for setting up zoom. AREERA (1998) – identified multistate research fund. In 2019, there were 45 NCs, 22 ERAs, 15 CCs, 3 DCs, 10 ACs, 0 RRs, 7 NRSPs (these receive off the top funding). Slide set listing participant benefits, engaging stakeholders, direct financial support, and committee responsibilities – shared via email to the lsitserv.

Question raised if NCERA 184 has submitted for the regional multistate award that multistate committees can apply to each year. -208 group applied a few years ago, 184 has not applied Multistate renewals and new projects are reviewed by the AA, NCERA184 just underwent a mid-term review, only suggestion from one of the department chairs was that there are some members listed that do not come to the meetings. Chris Hamilton – regional system administrator, submits final projects. NCERA 184 will expire September 30, 2022. At the 2021 meeting, a committee should be formed for writing the renewal.

Sept 15, 2021- Request to renew proposal with AA identified

Oct 15, 2021 - Upload objectives

Nov 15, 2021 - All participants added by AES in App E

Dec 1, 2021 - AA review due

Discussion of impact reporting, used by local experiment stations and other entities. Impacts should capture the difference that research or activities have made, “Why? Who cares? So What?”. What are the changes in knowledge, behavior, etc.? Outputs not equal to impacts.

1. **Albert Tenuta- Crop Protection Network (CPN) Update**

On behalf of the CPN advisory committee, thank you for your continued support. The goals of CPN are to reduce duplication and produce stronger outputs. The website has been revamped, a lot of effort from Daren at Iowa and Kiersten at Kentucky. Since 2018, there have been over 100,000 visits and over 45,000 publications downloaded. Disease loss estimates continue to be high impact. CCA credits are available for 19 publications, 0.5 credits. Almost 800 quizzes have been completed, >650 passed. Working on creating more webinars. In a recently conducted survey, 95% of respondents agreed CPN benefits end users, 85% feel that being part of CPN has helped them be more efficient.

A contingent attended the National Farm Machinery Show. Many farmers present, publications and handouts distributed. CPN has full-length papers, short publications, 1 page highlights, efficacy guides. New research update series to help distribute data to industry and producers.

Looking into next phases, enhancing existing partnerships and infrastructure. Support primarily through UKY and Iowa State, invited for full proposal to USB. Suggestions for enhancing infrastructure welcome - please continue to include CPN into proposals, @cropnetwork for tweets. A CPN advisory committee was established and met in Chicago at the end of 2019.

Question about wheat rust tracking and how that could link to CPN?

Joe F. – talking with CPN on how to better integrate mapping

1. **State Reports**

Arkansas – Terry

Not a lot of disease, 50,000 acres harvested (100,000 planted) avg. yield was up 60 bu/ac. Flooding situation not as bad as Mississippi, but still quite a lot of flooding. A little bit of FHB in patches. For 2019-20, claim 150,000 planted – very aggressive Arkansas Soil Health Alliance, a lot of cover crop mixes and wheat by itself

Delaware and Maryland – Alyssa

Wet spring that was favorable for FHB, but growers did not have much issue with symptom development or high DON. There were some fields with high levels of glume blotch, timely FHB applications of Miravis Ace controlled glume blotch as well. High spring aphid populations, but not a lot of fall aphid pressure so there was limited BYDV.

Georgia – Alfredo

Wheat acreage extremely low. Pretty disease free season, low level of leaf rusts, some Stagonospora, good year for FHB infection, but low disease and less FHB than previous years.

Illinois – Nathan

Prolonged wet spring, some issues with variability – hard to get out in the fields. Disease levels fairly low. Foliar diseases included wheat blotch complex, Parastagonospora, Septoria, rust came in after heading. Low FHB, BYD in the south at low levels.

Indiana – Darcy

Some pockets with severe FHB and docking. In these areas, there were well-timed fungicides, but a lot of rain. Susceptible lines showed disease across trials, but pretty quiet across the state.

Iowa – Daren

Iowa continues to have some of the lowest wheat production in the US. Not any interest in wheat as a cover crop, some chatter about oats (research side), more likely to be rye.

Kansas – Jessica Rupp

6.6 mil acres harvested. 2019 one of the wettest Mays on record, a lot of drown-out spots and low test weights. Stripe rust, leaf rust, and FHB present this year. 2019 planting went fairly well; southwest was very dry, many acres overwintering without tillering.

Kentucky- Carl

330,000 acres harvested, up some from 2018, but down from 10 yr average. Average yield 76 bu/acre, 10 yr avg. 72 bu. Leaf blotch, glume blotch, and FHB in trials, but not a lot of issues through the state. FHB remains an important disease in KY, varieties have gotten better- getting harder to find susceptible varieties for trials. There were about 5 days to plant wheat in 2019, so rain may have numbers down for this coming season.

Grad student projects looking at different spray systems and QoI resistance in *Parastagonospora* within KY. Working on adding to existing isolate collections. With the few isolates screened so far, QoI resistance is not at high frequency, but it is out there, G143A mutation.

Conducting winter barley IPM trials. Working on hybrid rye, some interest because of the bourbon industry. Rye does get FHB, with the large heads you have to recalibrate yourself for rating. Some severe scab observed, but DON values not as high (about 2 ppm) as what would be expected. Some foliar diseases in rye- blotch complex, *Pyrenophora* sp., isolated in trials.

Louisiana – Trey

Not many growers interested due to crop prices and wet falls. The past 4 out of 5 years have been bad scab year due to corn production and reduced tillage. Boyd has a graduate student with a project related to the Scab Initiative. Oat project looking at rust severity and photos as related to ground ratings. Working with the Baton Rouge wheat breeder, misted nursery for scab. Three parishes with stripe rust, oat stem rust, wheat stem rust in susceptible plots – earlier than usual.

Michigan – Martin

Very wet and cool fall in 2018, significant winter loss followed by a rough spring. Low disease pressure despite challenging weather patterns. Soft white wheat accounts for 1/3 of production, a plant growth regulator trial using a 20-year-old variety had the worse stem rust seen in years – reminder that the pathogens are still around and of the progress made in breeding. 2019 yield down significantly. Watch for root and stem diseases on prevented planting ground, may invite take-all and other soilborne issues. Pockets with 30% of land unable to be planted. Trying to understand winter barley and support malting industry, quality has been pretty good with low scab. A southern Michigan malt house is on line.

Mississippi – Tom

In 2018/19 there were 45,000 acres planted, 21,000 acres harvested. Some of this was cover crop, but also due to flooding issues in the south delta (500,000 acres under water, 350,000 of those acres are crop land) Averaged 47bu/acre. Low leaf rust, low stripe rust, head scab in the central delta, more bacterial leaf streak – some varietal differences, not listed on any commercial lists, a student has a project looking. Acres maybe similar to last year, likely none in the southeastern part of the state. Another wet fall could not get into the field to prep. 2020 has had 17.25 in of rain to date, (1/4 of annual).

Missouri – Kaitlyn

Quiet year for disease, just a lot of other problems. 550,000 acres planted, 390,000 harvested -winterkill, cold with no snow cover, and spring flooding. Some scab issues and uneven maturity. Weather conditions ideal for FHB, but humidity and rainfall dropped right at approach of flowering, low DON in trials. Limited stripe rust, showed up late. Fall 2019 was still recovering from early season flooding, corn harvested around Thanksgiving, wheat acreage likely down.

New York – Gary

Continuing work on Alternaria leaf spot, *Alternaria infectoria* complete genomes under way to see taxonomic placement. Hard to get it to sporulate, can only sporulate on wheat agar media – good chance it is in Michigan and Ontario. FHB continues to be the major problem – PhD student finished looking at population genetics of the fungus. Hypothesis that nonagricultural regions have different population profiles than main corn/soy/wheat systems. 15ADON and new NX-2 genotype at high frequency. Sampling wild grasslands and common grasses in and around small grains – population was not host dependent, but regional. Common grass weeds supported the overwintering and sporulation of *F. graminearum* at least as well as wheat did – they are a factor. There continues to be a major push in the state for malting barley, at least a dozen malt houses. DON has dropped a lot since 6 years ago, cultural practices and fungicide timing getting the risk down. A graduate student project is looking a flora of malting barley seed; so far, more species richness than in wheat. Dry, non-epidemic years favor navoninole from *F. poae.* Planted the USDA oat differential and only 5 showed susceptibility to crown rust, seem to be losing most popular varieties because of oat crown rust.

North Dakota – Andrew

6.7 million acres of spring wheat, 580,000 acres of barley, 720,000 acres of durum. Bacterial leaf streak with as much as 70% loss in susceptible varieties. Recently more two row barely than six row. Two row barley is pretty susceptible, some of the malt contracts will reject in the field if there is too much bacteria- not sure why. Working on qPCR assay to take to the field to try to test seed and ground truth, still learning. FHB problematic in the southern end of the state - #1 planted wheat variety was the most susceptible of the past 10 years. A lot of sprout damage and falling number issues, a lot of bad looking wheat still sitting in bins. No Ergot until January, some along field edges or field-wide levels. Contacted on how to grow ergot by Hamilton’s Pharmacopia, discovery of ergot museum in Dassel, Minnesota. A lot of corn still out in the field possibly elevating scab risk.

Ontario - Albert

1,000,000 acres planted in 2018, looked good at planting, but largest winter kill ever across Ontario – harvested around 400,000. Weather conditions conducive for FHB, but integrated FHB management approaches appear to be working. Some crown rust, spot and net blotch. 1.2 million acres planted in 2019.

Discussion spurred on FHB inoculum not going away, but varieties seem better and growers have improved knowledge of when to make timely fungicide applications. Trials showing that isolates from corn/wheat rotations are more aggressive. Corn stalks keeping inoculum high in many areas. How are cover crops (wheat, forage oat, etc.) affecting inoculum levels or completing green bridges? Should a group like this look at the impact of small grain cover crops on actual grain crops? Cases where FHB resistant varieties have not had stripe rust resistance. Stripe rust currently in LA, a little earlier than usual.

Tennessee – Heather

Planted 280,000 acres, harvested 215,000 acres. Not a big disease year, leaf blotch, very little late leaf rust and stripe rust, low FHB in field planted after corn. The FHB model is usually pretty good, 2014 was the last year with a lot of commercial calls. Yields of 67 bu/acre on par with usual. A lot of rain this spring, some acreage may turn into cover crop. UT entomologist has moved towards automatic sprays for aphids late winter/early spring +2bu response, in warmer falls a seed treatment may useful – investigating yield and an ELISA to test for BYD, not seeing a lot of BYD in the field

Virginia - Navjot

A lot of glume blotch, not a whole lot of scab.

Wisconsin – Damon

All about head scab, driving the decrease in planting wheat. In 2013 265,000 acres were harvested, in 2019 150,000 acres were harvested. The FHB model does not seem to cover the eastern part of the state, likely due to impacts of lake Michigan. Wheat acreage is moving away from southwest WI due to microclimate issues. Corn/soybean rotation continuing to increase. Small dairy farms are closing, but being bought by large operations, so there has been some increase in silage production. Deductions start at 2ppm, many loads were completely rejected last year. Corn has also had high mycotoxins over the past 3 years – favorable cropping systems, lots of inoculum, conducive weather trending wetter, mild temperatures. A little bit of *Cephalosporium* in specific areas with cold winter frost heaving. Foliar diseases included leaf rust, Septoria leaf blotch after heading, not much stripe rust since 2017 – moved in late last year after yield had been determined. No powdery mildew present recently.

Wheat farmer guide in the final stages. The book has been sent to APS and formatting is being finalized. Trying to have the guide available for promotion by APS meeting this August. Trying to find sponsorship support. APS wants $100,000 to cover each production guide – managed to generate $100,000 for each of the past two books. If we do no fundraise, looking at a price point of $300-400 dollars per copy, want to be at $25-30 per copy. Will send paperwork on sponsorship options and some previews if you are interested in trying to help with sponsorship at local boards and other local funding sources. Original push mid-April, the sooner the better to make contacts.

1. **Andrew Friskop – 2018 and 2019 Wheat Disease Loss Estimates**

Last year was the initial discussion of starting wheat disease loss estimates. In 2018, estimates were received from 25 states; ~70% of wheat production was represented. Top 10 diseases: FHB, Bacterial leaf streak and black chaff, root lesion nematodes Stagonospora, stripe rust, leaf rust, high plains disease, Septoria leaf spot, tan spot, powdery mildew. In 2019, estimates were received from 24 states. Top ten diseases: FHB, leaf rust, bacterial leaf streak, stripe rust, Septoria nodorum, tan spot, Septoria tritici blotch, high plains disease, Pythium root rot, powdery mildew. Across both years, the Top 5 diseases were: FHB, bacterial leaf streak, leaf rust, stripe rust, Stagonospora leaf blotch. Some states have more formalizes survey processes than others. Taking crop production estimates, adding on perceived losses from diseases, then finding an adjusted yield value. This information is incorporated in the wheat disease loss calculator. Goal to summarize a few years for a PHP publication and present as annual reports on CPN. Last year videos were made for scab management, some of these are in an iBook and it is done. If interested Andrew can send the link.

Question if bacterial leaf streak is more predominate in areas with irrigation. Just as much or worse in dry land, highly correlated with flag leaf out at a thunderstorm in ND, related to big temperature fluctuations, dew, and cooler temps in Mississippi.

Suggestion to lump *Septoria/Parastagonospora* leaf blotch complex, keep glume blotch separate.

What states were reporting high plains virus? Were they also seeing BYD? - Right now BYD is reported by itself and mosaics are grouped. High plains likely coming from MT, KS, SD, TX.

1. **Nathan Kleczewski– Wheat Virus Survey in Illinois from 2009-2019**

Follow up on some discussion starting back in 2011. In Illinois, around 500,000 acres of soft red winter wheat harvested annually. Viruses are economically important and symptoms may resemble abiotic disorders. To learn more about incidence and prevalence of viruses in Illinois, flag leaves were collected “at random” across field sites in 2009, 2010, 2011, and 2019 and sent to Agdia for ELISA based screens. Ten viruses and bacterial mosaic were screened in 304 field samples spanning 60 counties. BYD-PAV was found in around 20% of fields, WSSMV in 15%, along with high amount of samples with bacterial mosaic*, Clavibacter michiganense* subsp. Tessallarius (Cmt). Cmt favored by warm wet conditions, assumed to survive on residue and seed.

Discussion on the prevalence of bacterial mosaic in other areas. Possibility of detection, but not necessarily causing disease since it can live epiphytically. Several cases in Missouri this year, along with questions about impacts for seed production – not a lot of information available.

1. **Dan McDonald – Air Sampling for Plant Pathogens**

Cotton Inc. Project started in 2018. In 2019, funding was added to support some university collaborations and add other crops. Bringing together three companies: Mesur.io – big data and analytics, Phenotype Screening Corporation – induced expression phenotyping, Assured bio – advanced DNA based diagnostics, hospitals with the goal to safeguard agricultural productivity from airborne biological threats Questions asked in 2018 were – Can we capture pathogens out in the field? Can pathogens be separated out? The goal of 2019 was to expand soybean research plots in TN, AL, LA, KY and expanded to corn research plots in TN. Monitoring was conducted for 9 different pathogens through passive (no external power required) and active samplers (four ports powered by battery) – 18, 36, 54, and 72” sampling heights each collected separately. New 3D printed cassette used in 2019 to improve reuse and increase wind speed survivability.

Three sites in KY were monitored for temperature, wind speed, prevailing wind, and precipitation along with particulate matter and environmental cleaning of the air. Looking into factors that drive spore count dynamics (life cycle of the fungus, spore release process, impact of wind bearing, rain, and host surfaces). In cotton, three different pathogens were detected and quantified at different heights throughout the season. qPCR assays were also conducted, some probe and primer sets work better than others.

This project is transitioning to the National Predictive Modeling Tool Initiative. This is a 5 million dollar project with seven universities participating in corn, 11 universities in cotton, and a wheat team is currently being established. (Soybean was approached, but the USB was not supportive so wheat was selected). Wheat will have approximately $580,000 of the budget. The goal of this project is to aid with disease model risk forecasting and recommendations.

1. **Nathan Kleczewski – Wheat Leaf Disease Uniform Trial – discussion**

Is there interest in coordinated fungicide efficacy trials for non-FHN targeted applications in wheat? If yes, where should we start? Products? Timings? Participants? Discussion on application timings across states. Some states with flag leaf applications, some with Feekes 5 or 6 and anthesis, skip flag leaf. In more northern regions, no diseases active at earlier timings.

Nathan and Andrew will work on setting up some programs; Heather will help with the mid-south. Consensus to keep the trial below 12 treatments and focus on product timings.

1. **Joe LaForest – EDD Maps – Stripe Rust Monitoring**

EDD maps launched in 2005, mostly focused on invasive species as a way to aggregate data from other systems. Since that time started working with corn and soybeans and the question was raised if a map could be started for stripe rust. iPiPE has been focused more on common pests. Following the BASF purchase of the data provider behind iPiPE, iPiPE and EDDMaps are merging.

EDDMaps has picked up a number of maps that each have unique features to build from:

Pecan ipmPIPE – citizen/grower reporting network

Cucurbit and Basil Downy Mildew – instant alerts, text and email alerts, forecasting and risk assessment

IPM Center Supported Working Groups

Rose Rosette Disease – connecting to diagnostic labs, follow up with lab results

Corn and Soybean impPIPE – county status reporting, adding incidence and severity

New site name Ag Pest Monitor – still powered by EDDMapS. Set up for wheat county additions by state. Can integrate maps into already existing webpages and change the state abbreviation in the URL to zoom in on the state of interest.

Discussions about map coloring and possibly avoiding red. A colorblind friendly color map was sent to the group for continued deliberation of color selection. Interest in adding more commentary options to help viewers understand what observations are happening in the field. Also interest in adding a fallback national commentary like with the FHB map. Individual commentary to last for a few weeks and then default back to national commentary.

1. **Navjot Kaur - QoI resistance in *Parastagonospora nodorum***

SNB has been increasing in the mid-Atlantic. Frequent use of fungicides has potential to select for resistance as seen in *Zymoseptoria tritici* (QoI resistance first reported in Sweden in 2009, none reported yet in the US). Pyrosequencing methods to rapidly quantify G143A mutation have been developed in *Cercospora sojina* (Zhou and Mehl 2020). There was interest in investigating fungicide sensitivities in *P. norodum.* Samples were collected from four counties in VA and radial growth assays were conducted on plates amended with Azoxystrobin or Pyraclostrobin and SHAM (100ppm). Resistance was able to be detected at 10ppm. The cytb gene was also analyzed and 7 out of 74 isolates were found to have the G143A mutation. A pyrosequencing assay way developed to screen composite plant samples from wheat fields. This is the first known report of QoI resistance of *P. nodorum* in the US.

**Business Meeting**

Minutes of 2019 approved by Darcy, seconded by Damon, and accepted unanimously.

Reminder to submit state reports. Heather and Alyssa will looking into applying for the multistate award. Zoom meeting connection worked will and will be continued in future years. Can also look into recording zoom sessions in future years.

Discussion on the meeting for 2021. Kaitlyn will reach out to Juliet Marshall in the Western group to see if they would be interested in a joint meeting. Possibility of a stripe rust morning session with the western group. Potential meeting locations include Pensacola or meeting as part of the IPM Symposium occurring March 15-18, 2021 in Denver, Co. Space is available at the IPM symposium on Sunday, Monday, Thursday, or Friday. Consensus to look into meeting on Thursday 3/18 if Denver is the selected location.

Terry Spurlock was nominated (Kaitlyn, seconded by Darcy) and unanimously elected as secretary for 2021.