**2022-23 NCERA-184 Meeting Minutes**

**Hilton Pensacola Beach**

**Pensacola, Florida**

**February 28, 2023**

Chair: Kelsey Andersen Onofre, Kansas State University

Secretary: Ken Obasa, Texas AgriLife

**In-person Attendees:**

Trey Price, LSU Ag Center

Kiersten Wise, University of Kentucky

Darcy Telenko, Purdue University

Erick DeWolf, Kansas State University

Boyd Padgett LSU Ag Center

Rafael Luisa, University of Arkansas

Carl Bradley, University of Kentucky

Heather Kelly, University of Tennessee

Terry Spurlock, University of Arkansas

Tom Allan, Mississippi State University

Albert Tenuta, Ontario Ministry of Agriculture

Daren Mueller, Iowa State University

Maira Duffeck, Oklahoma State University

Meriem Aoun, Oklahoma State University

Andrew Friskop, North Dakota State University

Damon Smith, University of Wisconsin

Gary Bergstrom, Cornell University

Wanderson Bucker Moraes, Ohio State University

Tyler McFeters, Penn State University

Joe LaForest, University of Georgia – Southern IPM

Madalyn Shires, South Dakota State University

Stephen Wegulo, University of Nebraska Lincoln

Kelsey Andersen Onofre, Kansas State University

Marty Draper, Kansas State University

Oluseyi Fajolu, USDA- Cereal Disease Lab

Martin Chilvers, Michigan State University

Austin McCoy, Michigan State University

**Zoom Attendees:**

Jessica Rupp, Kansas State University

Alyssa Koehler, University of Delaware

Emmanuel Byamukama, USDA NIFA

James Kolmer, USDA-ARS

Ken Obasa, Texas A&M

Amer Fayed, USDA NIFA

**State Reports**

Louisiana

- Less than 50k acres of wheat.

- Low foliar disease year: low scab and little bit of stripe rust.

- Hot and dry during grain fill, yields ok, but TW low.

Indiana

- Acreages down.

- Low disease year: low levels of scab and other wheat diseases.

- Hot and dry in June.

Kansas

- 7 million acres of wheat.

- Drought was the biggest issue.

- Low amounts of foliar diseases.

- WSM was persistent and the biggest problem.

- Cover-crops and double-cropping are suspected may have contributed to the WSM problem.

Kentucky

- Wheat acreage stayed roughly the same at ~500k acres of wheat.

- FHB was low but there were occurrences in some unexpected areas.

- No DON concerns.

- Typical year for foliar diseases.

- QoI resistance confirmed in isolates of *Septoria tritici* and *Parastagonospora nodorum*. Findings published “Plant Disease” and “Plant Health Progress”.

- Ongoing work on FHB for rye (due to demand from local distillers).

- Very dry fall delayed planting.

On the subject of FHB and rye, the group had a brief discussion on susceptibility in rye, timing of infection, and window of fungicide application in comparison to wheat. It was noted rye might be susceptible to FHB for a longer period of time compared to wheat.

Tennessee

- Less than average disease year

- 300-400K acres

- Low precipitation

- Herbicide injury was a concern in the fall.

Arkansas

- 100-200K acres

- Very low foliar fungal disease pressure

- Low FHB

- Some bacterial leaf streak observed on susceptible varieties in trials

- Some lodging issues in plots

- May loose wheat fields in 2023 due to flooding from excessively wet fall and winter

Mississippi

- 50K acres

- Low foliar disease year

- Low FHB

- Dry fall followed by wet and warm winter may favor disease development

- A significant amount of bacteria leaf streak

Ontario

- 850K of wheat

- Great wheat acreage (a little over 1 million acres in 2023), as well as yield (average of 100 bushels) and economic potential.

- Winter survivability is a concern due to weather-related issues.

- FHB was low. Canadian FHB model not available to public this year due to new private company ownership.

- Conditions wet and cool during flowering.

- Very low disease pressure

Iowa

- Very small wheat acreage, in the hundreds.

- SE Iowa has sold more wheat seed than ever before

Ohio

- Low disease year.

- Dry through growing season

- FHB not an issue.

- June storm caused lodging in some areas, but overall, yields were good.

Oklahoma

- Severe drought.

- Very low fungal diseases.

- Late rust disease pressure.

- WSM will be a bigger problem in 2023 beyond the Oklahoma panhandle.

- Root rot prevalence was higher.

- BLS was found in one location in central Oklahoma.

North Dakota

- 7 to 8 million acres of small grains.

- Below average year for small grain diseases.

- Increased FHB risk following June rain. Extensive fungicide applications by farmers.

- Top diseases moving forward are FHB, BLS and ergot.

- ~Fifty-five percent of planted wheat varieties are susceptible to BLS.

The group had a brief discussion on ergot and the re-emergence of this disease in ND. Varieties are not overly susceptible, but there are a lot of grass host species. More research on this subject is still needed. Increased cover crop (rye) could be a factor, but ergot hasn’t been observed widely in those fields. No clear answers or management plan yet.

Wisconsin

- Organic production has increased.

- Wheat acreage has increased.

- Low to moderate disease pressure.

- Higher levels for tan spot possibly due to variety shifts.

- Low to moderate FHB

- Some research examining disease management in organic wheat production. Effort will likely need to focus on resistant varieties.

New York

- Very low foliar disease pressure.

- Pathogen sequences of *Alternaria infectoria* group (species complex) causing leaf spot on wheat now available.

- Powdery mildew increased on specific varieties.

- Advances on disease resistance research on malting barley varieties and characterization of Fusarium species in malting barley grain.

- Leaf rust epidermic on rye along the lake.

- Oat crown rust resistance is starting to breakdown.

- Ongoing Fusarium mycotoxin work.

- Dr. Bergstrom will retire in June 2023.

The group had a brief discussion on fungicide application on powdery mildew and if it is needed. Gary mentioned that PM is very variety specific, and Heather mentioned that dense planting can increase risk and need for fungicide. These applications are usually made at green-up with “cheap” products, often applied with herbicide. Carl’s research indicates that these applications are not economically beneficial.

Pennsylvania

- Low disease year.

- Low powdery mildew in northern part of state.

- Low FHB.

- Low amounts of rust.

South Dakota

- Drought.

- Low diseases year.

Nebraska

- Wheat production acreage down 29% from previous year. A total of 1.1 million acres were planted in the current year.

- Drought conditions prevalent and low disease year.

- Leaf spots at low severity

- Powdery mildew in eastern part of the state with low wheat acreages.

- Late arrival of leaf rust.

- Major disease is WSM complex, especially in the Panhandle region.

- Low amount of FHB.

Minnesota (Cereal Disease Lab Update)

- Low cereal rust in MN this year

Delaware/Maryland

- Wheat acreage up in current year.

- 2022 disease pressure was moderate.

- Some FHB disease pressure.

- Most damage was in barley with FHB in addition to frost damage.

- Above average yields.

- Received several samples with physiological spots and virus-like symptoms.

**Open Group Discussions**

The group had a discussion on the complex of viruses that contribute to wheat streak mosaic virus. Carl mentioned that they have a virus survey that has few viruses overall, but wheat streak is appearing in the survey results. It has not been a problem in KY. OK has also had samples test positive for WSMV and High Plains virus. Gary Bergstrom recalled that Char Hollingsworth found aster yellows frequently masked virus symptoms over several states. This work has not continued to our knowledge. There will be a group discussion and the hope of getting a regional team to explore wheat virus issues. A meeting will be held in Texas.

Terry Spurlock noted that the tolerance for FHB has decreased as wheat prices have increased. There are some opportunities for grower education on FHB and mycotoxin tolerances and optimizing application technology.

The group also discussed the fungicide efficacy table, which is near completion. Prosaro Pro was added to the table. It was noted that the table is getting long and likely will not fit on two pages as with past tables. There was some discussion on if Folicur (tebuconazole) should be removed, and it was agreed that it should stay. Footnotes could be condensed and edited. There could be products labeled for ergot suppression in coming years. Additional discussions were held on the best way to edit/communicate about the table, but the current format seems to be working. Kelsey will therefore continue with this format, and target January as the timeline for the table.

**Crop Protection Network Updates - Kiersten Wise, UKY**

* 200 university contributors.
* Board of directors and staff intro (see slide deck).
* New brand launched in January – added alfalfa and cotton.
* New website launched a year ago, search function is better, less susceptible to “bots”.
	+ 150,000 page views, 1 new webbook, 12 new overview or research review publications, 36 encyclopedia articles, March-October is peak season – a lot of returning users.
	+ Corn 49%, soybean 31%, wheat 19% of page views
	+ Fungicide efficacy most popular outputs, most impactful – unbiased source
	+ Popular topics – tar spot, disease loss estimates, research reviews
	+ CPN scholarly impact – check google scholar.
	+ CEUs awarded increasing 2,689 in 2022.
	+ CPN podcast – some wheat disease episodes over 1,500 downloads on 3 wheat diseases
	+ 1,000 followers on Twitter and Instagram
	+ Virtual Crop Scouting School – pre-recorded topics
	+ CPN.TV- live with ASA, 11 webinars.
	+ Wheat impacts: 4-year disease loss estimate summary ready for PHP, 2021 and 2022 loss estimates added to disease loss calculator.
	+ New initiatives – engagement with colleagues – APS meetings and social
	+ New content submission online <https://app.smartsheet.com/b/form/26d3d9f351234d0490afce1f1103f807>
	+ Expanding to soybean insect loss calculator, and insect encyclopedia and expand into weed science, Science for Success partnership, Cotton Inc. sharing disease loss estimates.
	+ Involvement with new faculty – gift box for them, reach out and build relationships – engage new faculty on content development.
	+ Annual impact statements are available for contributions to Admin.
	+ Questions: other areas – such as models and multi-state initiatives…..discussion on what is needed for logistics.

Kiersten Wise presented an update on CPN. The group had a productive 2022, launching a new website and new initiatives, including on-demand webinars through CPN.TV. CPN is working to increase impact, by recruiting new users, and working to increase/document scholarly impact and provide impact statements on an annual basis. If anyone has an idea or would like to submit content through CPN, there is a new link on the main page of the website that allows people to submit content ideas.

**Collaborative Wheat Research Updates - Andrew Friskop, NDSU**

* Wheat disease loss estimates
	+ 2018 started and annual reports published on CPN, 4-year summary manuscript drafted for publication
		- Economic losses 2018-2021 -1. FHB, 2. Stripe rust, 3. Leaf rust, 4. Bacterial leaf streak, 5. Tan spot
		- 2022 top 8 – see publication.
		- How are we standardizing disease loss estimates? use of crop surveys, diagnostic lab frequency, network with ag professionals, number over-time.
		- Any surprises with this list? Virus disease up and down.
		- They help with justification/priorities with commodity boards.
		- Should we include abiotic factors in loss estimates? drought, frost damage, should we involve agronomists, NASS yields can help reflect yields.

Andrew Friskop presented on the progress of the group, including the wheat disease loss estimates and thanked the group for making that project possible. He mentioned the most economically important wheat diseases from 2018 to 2021 were in order:

1. Fusarium head blight
2. Stripe rust
3. Leaf rust
4. Bacterial leaf streak
5. Tan spot

And for 2022:

1. Stagonospora nodorum blotch
2. Fusarium head blight
3. High plains disease/triticum mosaic/wheat streak mosaic
4. Leaf rust
5. Barley yellow dwarf
6. Powdery mildew
7. Stripe rust
8. Common root and foot rot

Pierce asked about data standardization methods, and Andrew discussed that methods for collection vary, and most people use multiple sources of data to create the loss estimates. The disease loss estimates could be used to support future projects.

Andrew also discussed the uniform foliar fungicide trial for T-2 timings. This trial helps answer questions about fungicide applications at flag leaf. The 2022 uniform foliar fungicide trial treatment list included 9 treatments focused on the FGS8-9 timing, with one treatment at a 10.5.1 timing, and a non-treated control. Four states participated. However, disease pressure was low to moderate, with tan spot, leaf rust, *Septoria tritici* blotch, and *Stagonospora* observed. In 2022, all fungicide applications statistically lowered flag leaf severity compared to the non-treated control. There was no impact of treatment on yield. The treatment list will remain the same in 2023. Data from trials with low or no disease are still welcome. Anyone who has data to submit is encouraged to send data to Andrew. Andrew also mentioned that the wheat disease loss estimate paper for Plant Health Progress is in progress.

There was a brief discussion on including abiotic factors in the wheat disease loss estimates to include factors, such as drought, winter damage, etc. This will be considered.

**UFT wheat foliar disease**

* + T2 timing target (flag-leaf application, Fks 8-9)
	+ 10 products, 9 at FKS 8-9 plus Prosaro at 10.5.1, RCBD, reps, low to moderate diseases pressure.
	+ 4 locations: tan spot, leaf rust, Septoria and Stag major disease – all fungicides better than NTC
	+ Not significant yield responses thus far, combined all market classes.
	+ Supports wheat efficacy table.
	+ 2023 same treatment list – will post protocol to basecamp.
	+ Reminder if you have 2022 data send to Andrew.

**Rust in hard red winter wheat - Meriem Aoun, OSU**

* Stripe rust 2021 (5% loss), pyramid resistant genes
* OSU elite breeding lines with APR genes
* Strip rust resistance in RPN is mostly APR – adult plant resistance vs. seedling – resistance may be temperature dependent.

Meriem Aoun presented on rust resistance in U.S. hard winter wheat regional nurseries. Genetic analysis was used to test lines for leaf rust and stripe rust. Multiple trials were presented that examined rust resistance in greenhouse and field screenings. Stripe rust resistance in RPN lines is tested at multiple locations. Lines with APR may not perform as well under cool temperature conditions (Washington) compared to in warmer conditions. Ten elite breeding lines exist from OSU that carry APR. Efforts are underway to identify leaf rust and stripe rust resistance genes in the variety ‘Big Country’.

**Effects of Temperature, Moisture, Grain Development, and Harvesting Strategy on Wheat Grain Contamination with Zearalenone - Wanderson Moraes, OSU**

* ZEA threshold 0.1 ppm in Europe vs. DON at 1.0 ppm by FDA
* Zea production associated with wet, delayed harvest.
* Controlled envi: temperature and RH
	+ 100% RH high levels of ZEA vs other levels 90, 80, 70 and at
	+ ZEA higher at 20 and 25 vs 30 C
* Harvest strategy: Harvest early, dry before storage
	+ Simulated rain-fall and harvest.
	+ ZEA increased at 35 days after anthesis, 51 high levels of ZEA up to 7.0 ppm.
	+ Harvest late with rain = increased ZEA
	+ Publication is now available at first look.
	+ Plant disease publication on genetic resistance for ZEA as well, MS, MR led to over 75% control of ZEA production, FHB management tools are good for ZEA as well.

Wanderson Bucker Moraes presented on research managing wheat contamination with zearalenone (ZEA). Europe has set thresholds for ZEA at .1 ppm, indicating that it is more toxic than DON. However, ZEA production is poorly understood. Research examined the influence of temperature and relative humidity on ZEA and measured FHB index. At low RH, there were low levels of ZEA, but at high humidity, high levels of ZEA were observed, particularly at 20°C and 25°C. Harvest strategies were examined to reduce impact on ZEA. Harvesting early and drying grain before storage are recommended to minimize mycotoxin impact. Additional trials examined the effect of grain development, rainfall and harvest strategies on ZEA production. The highest levels of ZEA were observed after 35 days under both natural and inoculated plots. Three rainfall regimes were studied over harvest periods from 11 to 2 days prior to harvest. Highest ZEA was observed when rain occurred in the pre-harvest period. This research is published in Phytopathology. FHB-favorable conditions may lead to grain contamination with ZEA, but FHB and DON management also manage ZEA.

**NIFA Updates - Emmanuel Byamukama**

* Emmanuel and Amer NIFA reps.
* See shared slide deck.
* NIFA almost back to full capacity (3939 FTE).
* See USDA strategic goals (6) and NIFA strategic goals.
* FY2023 is similar to 2022, 2024 will depend on new farm bill.
* Programs for this group:
	+ CPPM – ARDP (mid Feb proposals due).
	+ MBT (methyl-bromide alternatives).
	+ AFRI – FAS, EWD, SAS
		- A1112 Pest and beneficial species – Sep 21, 2023.
		- CARE-A1701 -Sep 14, 2023 – integrated projects only.
		- A1181 Ag Biosecurity – biological threats to food security – Aug 10, 2023.
		- SCRI, SARE (Nov 14), OREI, ORG.
* NIFA newsletter and websites available with information.
* Looking for proposal reviewers.

Emmanuel Byamukama gave an update on USDA-NIFA initiatives. Emmanuel will provide slides that can be uploaded and reviewed. Everyone should review the 2022-2026 strategic goals in the USDA strategic plan. The NIFA strategic plan and strategic goals are also available for review. Climate change and food safety are focus areas of both strategic plans. The current FY 2024 budget is pending the Farm Bill. They would like to highlight the A1112: Pests and beneficial species in agricultural production systems program to this group. Application deadline is 9/21/23, as well as the AFRI CARE program that focuses on areas that need immediate attention. This program is research and extension, and applications are due 9/14/23. Other program areas that may be of interest are: Agricultural Biosecurity (A1181), SCRI organics, among others. The Upcoming Request for Applications Calendar can be accessed to determine what RFAs are available and funding deadlines. There is also a NIFA newsletter that everyone can subscribe to and receive updates.

**Meta-analysis of yield response to applications of fungicides at different growth stages in Michigan -Martin Chilvers, MSU**

* PHP 23:300-307.
* 3 timings (Fk 4-6, Fk 9, 10.5.1).
* T1 - 4 bu/A response – could pay for adding fungicide, T3 – 7.4 bu, T1\_T3 10.5 bu/A.
* Where to go next Multi-state effort? Refine growth stage categories? Examine chemistries? and Location yield potential?

**Updates on stripe rust research - Erick De Wolf, KSU**

* Reemergence of strip rust, new lineages more aggressive under heat stress.
* No difference in groups of pathogens under cool conditions, but under warm temp the older population is slower to recover from heat stress vs. more recent populations recover faster.
* Evidence that contemporary populations are more aggressive in warm environments vs historic.
* There’s still variation in the contemporary populations.

**Agpestmonitor: do we keep wheat functions active? - Joe LaForest, UGA**

* Strip rust only disease on website – 169 page views, 69 users in 2022.
* Where is the map embedded? Just the sites, no other locations.
* What would you like to happen to the site?
* Wheat.agpestmonitor.org.
* Tracking is important for strip rust, sync with cereal disease lab.
* Reporting on same site as corn and soybean, all should have access - let Joe know if anyone needs access to help report.
* iPiPE moved into Eddmaps to preserve.

**Updates on small grains fungicide trials in Pennsylvania - Tyler McFeaters, PSU**

* Lower FHB in 2020-2022 vs 2018 and 2019, vs. higher foliar disease in 2021 and 2022
* No difference between single and double applications for 2018-2022 data
* Development of a decision support platform for disease management – risk profiling
	+ 20 years of PDMR data and meta-analysis of data across diseases and classes.
	+ Validation of FHB tool
	+ On-farm trial for wheat disease evaluation

**ARS-CDL annual cereal rust survey updates - Oluseyi Fajolu, USDA-ARS**

* Introduction to cereal disease lab and cereal rust survey
	+ 2 FHB labs.
	+ 5 rust labs – continue monitoring rust populations across U.S., please help them monitor.
	+ Have leaflets to get rust samples, sampling envelopes and postage envelopes. Will send out a digital form.
	+ 50 years + survey.
	+ Cereal rust bulletin USDA – monthly and biweekly publication.
	+ Integrating maps with EDD and USDA.
	+ *P. triticina* samples are race-identified by Jim Kolmer.
	+ CDL depends on leaf samples from other regions for representations, they need more samples to process.
	+ Join list for updates, emails.

**Business Meeting**

Kelsey Andersen Onofre, KSU - Chair 2022/23

Ken Obasa, Texas A&M University - Secretary 2022/23; Chair 2023/24

* Approval of minutes from 2022 motion to approve Erik, Tom seconded. Motion passed.
* Need to fill out state report forms if you haven’t with publications, etc. by March 15.
* Meeting venue for 2023 and date?
	+ Co-meetings with other groups SSDW, Scab forum/CDWG, Western or Eastern wheat workers, NC APS, S-APS in SC in Feb, NPMTI
	+ Timeframe?
	+ Send a survey in a week or so.
* Chair nominations – Eric DeWolf, nominated, everyone seconded. Motion passed.
* Tom Allen motion to adjourn, Andrew F. seconded, meeting ended 3:55 pm.