**Minutes of the NCERA – 184 Wheat Diseases Technical Committee Meeting**

**March 5, 2018 – Pensacola, FL**

**Administrative Advisor:** Dr. Kendall Lamkey, Iowa State University

**Chair:** Dr. Emmanuel Byamukama, South Dakota State University

**Secretary:** Dr. Madeleine Smith, University of Minnesota

**Immediate Past Chair:** Dr. Nathan M. Kleczewski, University of Illinois

**Members and Guests in Attendance**:

|  |  |
| --- | --- |
| Carl Bradley | Kentucky |
| Stephen Wegulo | Nebraska |
| Shaukat Ali | South Dakota |
| Martin Nagelkirk | Michigan |
| Gary Bergstrom | New York |
| Nathnan Kleczewski | Illinois |
| Damon Smith | Wisconsin |
| Andrew Friskop | North Dakota |
| Kiersten Wise | Kentucky |
| Daren Mueller | Iowa |
| Kaitlyn Bissonnette | Missouri |
| Albert Tenuta | OMAFRA, Canada |
| Heather Kelly | Tennessee |
| Terry Spurlock | Arkansas |
| Tom Allen | Mississippi |
| Trey Price | Louisiana |
| Boyd Padgett | Louisiana |
| Rachel Guyer | Tennessee |
| Rubella Goswami | USDA -NIFA |
| Darcy Telenko | Indiana |
| Pooria Ensafi | Idaho |
| Emmanuel Byamukama | South Dakota |
| Martin Chilvers | Michigan |

**Brief Summary of Minutes of the Annual Meeting**

The 2018 meeting of the NCERA 184 Small Grain Diseases Committee was held at the Hilton Pensacola Beach Gulf Front Hotel, FL on March 5th 2018. The meeting started at 9:01 with the current chair welcoming members and thanking them for attending the meeting. Self-introductions were done and were followed by state reports. One observation that was common across the states was that wheat acres are declining, partly due to the low grain prices.

The majority of states experienced stripe rust in wheat than previous years. In Wisconsin, it was strongly thought that stripe rust pathogen overwintered in the state. The same is believed for stripe rust in Ontario, Canada. New York State reported a new leaf spot disease of wheat caused by *Alternaria infectoria*, its impact on yield is not known at the moment.

On the discussion of stripe rust and FHB management, it was a general consensus to apply a fungicide if stripe rust is present and conditions continue to favor its development, rather than to wait a few days to reach flowering or other growth stage-based fungicide applications.

Another discussion that came about during the state reports was use of cover crops that contain cereal crops. These might maintain the “green bridge” and be sources of inoculum for the grain cereal crop. No conclusive recommendations were reached on this topic.

**Presentations during the meeting:**

Dr. Kiersten Wise gave a presentation on *Fusarium graminearum* and fungicide resistance. Her lab screened 47 isolates of *F. graminearum* for sensitivity to Metconazole and Tebuconazole. She reported that the two fungicides had ranges of intrinsic activity similar to what has been reported in other pathogens. She also reported significant differences among isolates collected prior to 2000 versus those collected 2000-2014.

Mr.Pooria Ensafi, a PhD student working on cereal cyst nematode presented to the group about the cereal cyst nematode. He mentioned how this nematode has only one cycle per year because it has to go through winter dormancy in order to hatch. He also said that there is difficult in identifying this nematode because of close similarity to other cyst forming nematodes. Interestingly, cultivars with stripe resistance are also resistant to cereal cyst nematode with a few exceptions. The best management options for this nematode are rotations into non cereal crops for at least 3 years and planting resistant cultivars.

Dr. Byamukama presented on effects of fungicide timing on crown rust and grain quality in oats.   
Three cultivars with varying level of susceptibility to crown rust were used and the trial was planted at two sites in South Dakota and at Crookston MN and Forgo, ND. He noted that the best timing was at flag leaf and that in the absence of disease, fungicide application did not improve grain quality irrespective of the timing.

Dr. Martin Chilvers gave a talk on isothermal amplification, in which he said that isothermal amplification is different from qPCR because it runs on a constant temperature. Because this technique uses a constant low temperature, there is no need for expensive equipment, even body temperature is sufficient to run the reaction. Some people use armpits as the heating block! This makes isothermal assays field deployable and can be done at the back of a truck. The isothermal technique he discussed was on recombinase polymerase amplification or RPA. He said this technique can take as few as 20 minutes to get diagnosis results.

Dr. Shaukat Ali discussed the root rot pathogens of wheat and their impact on seed germination across five cultivars. *Fusarium graminearum* and *Bipolaris sorokiniana* affected seed germination and seedling survival. There were cultivar differences with Russ and Oxen being the most susceptible cultivars to the two pathogens. Fungicides increased seed germination between 2-13% on inoculated plots but yield was not measured.

It was observed by other members that seed treatments may not realize return on investment in case of limited disease pressure, even though seed treatments can improve plant stand. However, for seed borne pathogens such as common bunt pathogen, loose smut pathogen, a seed treatment is beneficial.

Dr. Andrew Friskop presented on barley fungicide timing and he noted that the best timing for applying a fungicide to manage FHB is full head. He prefers the term “full head” instead of “heading” which may be ambiguous. He defined full head as when the peduncle is starting to be exposed. He said the combination of host resistance and a well-timed fungicide at full head was more effective in reducing FHB and DON than using fungicide alone on a susceptible cultivar.

Dr. Carl Bradley discussed on the efficacy of Miravis in the management of FHB. This is a new product from Syngenta that is a combination of Tilt and Adepdyn. He reported that this product was as good and in some instances better than traditional fungicides Caramba and Prosaro in managing FHB. He also said late applications; 3 days after flowering were also effective. However, for reduction of DON, best timing was at 10.5.1.

**Other discussions**

On the fungicide efficacy table, Delaro was one fungicide that could be added but members wondered if there is enough data. Erick DeWolf would follow-up to inquire if there is enough data.

On the possible topics for next year’s meeting, stripe rust management, wheat virus in Ohio (chair to inquire from Pierce), could be possible topics. The chair will follow up with members for topics that could be discussed next year. It was agreed that state reports should be given more time and members should consider sharing their fungicide efficacy results during next year’s meeting

On the location for next year’s meeting – Madeleine is to consult with Western wheat pathology group for a possible joint meeting or Great Lakes wheat group who will be having their meeting in Michigan.

Martin Chilvers was unanimously elected as the next secretary.

The meeting ended with a vote of thanks from the chair and was adjourned at 3:20pm.

**NCERA 184 Accomplishments.**

The NCERA 184 Group for management of small grains diseases has continued to be a very proactive and productive group in 2017. The members continued to make progress on the projects the objectives below and their activities broadly fell under these objectives.

1. *Better characterize best management practices for Fusarium Head Blight and leaf diseases in wheat and barley*

Large multistate collaborative research has been undertaken by the members with the support of the US Wheat/Barley Scab Initiative in to best management practice for Fusarium head blight, including timing of fungicide applications combined with predictive risk forecasting and varietal selection.

1. *Conduct fungicide efficacy trials for diseases in small grains*

Studies conducted by members have provided the data to updated the current NCERA 184 Fungicide Efficacy table for small grains diseases and members have disseminated this information through their Extension programming efforts.

1. *Improve disease management through forecasting tools*

Through coordinated multi state trials in which members participate, data to improve current disease forecasting models for Fusarium head blight have been gathered are being added in to models at Kansas State University to improve forecasting accuracy.

**Impacts**

* Improved accuracy of risk forecasting models for Fusarium head blight
* Conducted field trials to evaluate efficacy of chemical control methods for leaf and head diseases
* Disseminated current best management practices on numerous diseases to growers through Extension and Outreach efforts reducing input costs
* Various surveying efforts monitored disease outbreaks throughout the season to provide timely information to growers on disease management

**State Reports and Impact Statements Follow**

**Arkansas**

Terry Spurlock, Associate Professor and Extension Plant Pathologist

University of Arkansas System Division of Agriculture

**Personnel involved in wheat disease extension and research:** Terry Spurlock, Barry Boney, Mandy Tolbert, Larry Earnest, Linda Martin, Jason Kelly

**2017 wheat production and major diseases**

According to the USDA National Agricultural Statistics Service, approximately 133,000 acres of wheat were harvested in 2017 with an average yield of 55 bu/acre. Yield was not different from 2015 or 2016 but acreage was down substantially from the 240,000 acres reported in 2015 and 150,000 reported in 2016. This was due in large part to harvest flooding issues and concerns over late season pest management of soybeans planted behind wheat.

For the sixth consecutive year, stripe rust was found in early January on tillering wheat. Varieties susceptible to stripe rust were planted in some areas in eastern and far north eastern Arkansas. Many of these fields were not harvested as they were considered total losses prior to maturity. Leaf rust was present in some fields and reported at higher levels in the minor wheat acreage in southwestern Arkansas and the Arkansas River Valley in the central part of the state. Other diseases found were: Septoria tritici blotch and Stagonospora nodorum blotch, loose smut, and Fusarium head blight. These diseases did not appear to substantially impact yield or grain quality although some fields in Ashley County had more scab than in other parts of the state.

**Impact statements:**

1.Responded to numerous field calls to determine diseases present and provide management options.

2. Completed multiple foliar fungicide and fungicide x variety trials to provide farmers with current product efficacy data.

**2017 Kentucky Report - NCERA 184**

Carl A. Bradley, University of Kentucky

**The 2016-17 Winter Wheat Growing Season**

Soft red winter wheat harvested acreage in Kentucky for the 2016-17 growing season was 310,000 acres, which is the second lowest number of acres harvested in the last 10 years (195,000 acres in 2010 was the lowest). From 2008 to 2017, the harvested wheat acreage in Kentucky has ranged from 195,000 acres to 610,000 acres. The state average yield was 77 bu/A, which is the second greatest state average yield in the last 10 years (80 bu/A in 2016 was the greatest). From 2008 to 2017, the state average yield has ranged from 57 bu/A to 80 bu/A.

In general, disease incidence was low across Kentucky for the 2016-17 growing season. Diseases observed that impacted yield and/or quality in a few localized fields were Fusarium head blight, Stagonospora glume blotch, stripe rust, and barley yellow dwarf.

**Activities**

Small grain pathology research activities in the Bradley laboratory include:

* Fungicide efficacy trials for management of foliar diseases of wheat
* Fungicide efficacy trials for management of Fusarium head blight of wheat
* Integrated management of Fusarium head blight of wheat
* Fungicide application timing evaluations for management of Fusarium head blight of winter barley
* Evaluation of different fungicide application systems for improved head coverage and efficacy against Fusarium head blight (in collaboration with Dr. Tim Stombaugh, Ag Engineer, Univ. KY)
* Effect of wheat harvest timing on DON contamination of grain (in collaboration with Dr. Carrie Knott, Agronomist, Univ. KY)

**Outputs**

* Wrote commentary on the Fusarium Head Blight Prediction Center during critical times of the growing season
* Wrote and posted articles on timely wheat disease management information on Kentucky Pest News and UK Grain Crops Blog during the growing season
* Identified effective fungicides for management of foliar and head diseases of wheat
* Identified potential effective fungicide application timings for management of Fusarium head blight of winter barley
* Identified potential ways to improve wheat head coverage with foliar fungicides

**Publications**

Bradley, C.A., Madden, L.V., and Paul, P.A. 2017. Multi-state research on the effect of quinone outside inhibitor fungicides on DON contamination in wheat grain. In: S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proceedings of the 2017 National Fusarium Head Blight Forum (p. 6). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative.

Bradley, C.A., K. Mehl, and J. Duckworth. 2017. Effect of a new SDHI fungicide (adepidyn) in managing FHB and DON on soft red winter wheat in Kentucky. In: S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proceedings of the 2017 National Fusarium Head Blight Forum (p. 5). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative.

Rod, K.S., C.A. Knott, and C.A. Bradley. 2017. Decreasing deoxynivalenol (DON) contamination in soft red winter wheat grain through agronomic practices in Kentucky. In: S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proceedings of the 2017 National Fusarium Head Blight Forum (p. 19). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative.

Salgado, J.D., K. Ames, G. Bergstrom, C. Bradley, E. Byamukama, J. Cummings, V. Chapara, M.I. Chilvers, R. Dill-Macky, A. Friskop, P. Gautam, N. Kleczewski, L.V. Madden, E. Milus, M. Nagelkirk, J. Ransom, K. Ruden, J. Stevens, S. Wegulo, K. Wise, D. Yabwalo, and P.A. Paul. 2017. Robus management programs to minimize losses due to Fusarium head blight and deoxynivalenol in wheat. In: S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proceedings of the 2017 National Fusarium Head Blight Forum (pp. 26-27). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative.

Salgado, J.D., G. Bergstrom, C. Bradley, K. Bowen, E. Byamukama, A. Byrne, A. Collins, C. Cowger, J. Cummings, V. Chapara, M.I. Chilvers, R. Dill-Macky, H.M. Darby, A. Friskop, N. Kleczewski, L.V. Madden, J. Marshall, H. Mehl, M. Nagelkirk, J. Stevens, D. Smith, M. Smith, S. Wegulo, K. Wise, D. Yabwalo, H.M. Young-Kelly, and P.A. Paul. 2017. Efficacy of two-treatment fungicide programs for FHB management: a multi-state coordinated project. In: S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proceedings of the 2017 National Fusarium Head Blight Forum (pp. 20-25). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative.

**NCERA 184 Michigan Report, 2017**

Martin Nagelkirk, MSU Extension Educator, Michigan State University

Martin Chilvers, Assistant Professor, Michigan State University

***Personnel:***

Martin Chilvers, Adam Byrnes, Mikaela Breunig and Eric Olson, Dennis Pennington, Plant, Soil and Microbial Sciences, Michigan State University; and Martin Nagelkirk, MSU Extension, Michigan State University

***Summary of the 2017 growing season***

Michigan wheat growers produce both soft red winter and soft wheat winter wheat. The combined acreage of the two subclasses was approximately 430,000 in 2017. The weather was not as conducive to wheat production as in past years as average wheat yields were only 79 bu/ac, a 10 bu/ac reduction from 2016. Overall, disease pressure was relatively light. Stripe rust was evident beginning in late May, but its severity was significantly less that in 2016. The most common foliar disease was Septoria leaf spot. Pressure from the other foliar diseases of perennial concern, including powdery mildew, Stagonospora leaf blotch, and leaf rust, were relatively light. For the second year in a row, there was little evidence of Fusarium head blight in the maturing crop and, accordingly, DON levels were very low in the harvested grain.

There is renewed interest in barley production in Michigan in response to the growing craft brewing industry. Researchers are evaluating various spring and winter varieties, and are attempting to identify plant diseases that may pose as threats to the crop. To date, Fusarium head blight is of greatest concern.

***Impact of research and Extension efforts addressing wheat diseases:***

The probability of losses due to Fusarium head blight and foliar diseases have been substantially reduced in recent years as MSU personnel continue to promote the use of resistant varieties and fungicides. The adoption of varieties possessing improved resistance to disease has been particularly beneficial to growers of soft red winter wheat. Comparing grower responses to a [2011 survey](http://fieldcrop.msu.edu/uploads/files/Variety%20use%20in%20MI-1-23-12.pdf) and a [2016 survey](http://fieldcrop.msu.edu/uploads/files/Summary_2016_survey_2.pdf), acreage hosting a fully susceptible soft red variety was reduced from 91 to 30 percent. Further, the acreage of soft red varieties ranked as being moderately resistant to fusarium increased from 0 to 22 percent. Collaborative efforts including those through the NCERA-184 committee and the USWBHI projects have facilitated these multistate efforts.

Wheat research and education also promotes the use of fungicides when warranted. Currently, over 95 percent of the soft white acreage and perhaps 60 percent of the soft red acreage receives a recommended fungicide at flowering to combat both Fusarium head blight and various leaf diseases.

During 2017, MSU particularly emphasized to growers the need to manage stripe rust in susceptible varieties. The need for stripe rust management was emphasized during wintertime grower meetings and when the disease was found in crop using electronic communication and field meetings. Stripe rust was also addressed in on-going field research during 2017 with emphasis on fungicide efficacy and application timing, and variety assessments.

***Fact sheets, articles and research summaries:***

L Siler et al (2017) Michigan State Wheat Performance Trials. <https://varietytrials.msu.edu/wp-content/uploads/2017/07/2017-MSU-Wheat-Report-EXP-FINAL-07_31_17.pdf>

Nagelkirk, M.L., Byrne, A.M., Chilvers, M.I. 2018. Effect of fungicides on Septoria leaf spot, stripe rust, and head scab control on winter wheat, 2017. Plant Disease Management Reports 12:CF026

Breunig, M., Byrne, A.M., Boyse, J.F., Nagelkirk, M., Chilvers, M.I. 2018. Effects of fungicides on the performance of winter wheat in Michigan, 2017. Plant Disease Management Reports 12:CF072

Byrne, A.M., Chilvers, M.I. M. Breunig, Olson, E., Siler, L. 2017. Effect of fungicides on performance of winter wheat in Michigan, 2016. Plant Disease Management Reports 11:FC029

Breunig, M., Byrne, A.M., Chilvers, M.I., Nagelkirk, M. 2017 Effects of post-flowering applications of fungicides on stripe rust control and performance of winter wheat, 2016. Plant Disease Management Reports 11:CF027

M Nagelkirk., M.I Chilvers. (2016) Managing Fusarium Head Blight

<http://fieldcrop.msu.edu/uploads/files/FHB_Sheet_2016_final.pdf>

M Nagelkirk. (2016/2017) Stripe rust susceptibility of Michigan wheat varieties <http://fieldcrop.msu.edu/uploads/files/strip_rust_2017.pdf>

***Newsletter and Articles;***

Wheat Update (newsletter for MI wheat growers), M.L. Nagelkirk (2017) <http://www.miwheat.org/education/production-articles/>

Using fungicides to suppress Fusarium head scab in wheat, M.L. Nagelkirk and M.I. Chilvers (2017) <http://msue.anr.msu.edu/news/using_fungicides_to_suppress_fusarium_head_scab_in_wheat>

The 2017 wheat season is underway in Michigan, M.L. Nagelkirk (2017) <http://msue.anr.msu.edu/news/the_2017_wheat_season_is_underway_in_michigan>

***Presentations to growers related to wheat diseases and management, 2017:***

Wheat field meetings, (six informal field meetings held at various locations across the state) D. Pennington, E. Olson, L. Brown and M. Nagelkirk (2017) <http://msue.anr.msu.edu/news/local_wheat_production_field_meetings_scheduled_during_june_2017>

Pest and Field Crop Management Seminars, (grower meetings on various topics including wheat disease) M.I. Chilvers (2017) <http://msue.anr.msu.edu/news/pest_and_field_crop_management_update_meetings_in_february_2017>

Integrated Crop and Pest Mangement Meeting, M.I Chilvers and M.L.Nagelkirk (2017)

<http://msue.anr.msu.edu/news/final_call_for_2017_integrated_crop_and_pest_management_update>

Thumb Ag Reviews, 2017 (four grower meetings conducted in Michigan Thumb and Saginaw Valley regions) M.Nagelkirk , R. Battel, P. Kaatz <http://msue.anr.msu.edu/events/2017_thumb_ag_review>

Wheat field day and disease discussion. East Lansing, MI. Jun 14, 2017. 182 participants

Mycotoxin issues in Michigan. East Lansing, MI. Jun 13, 2017 55 participants

Wheat plot tours, disease and fertility discussion. Saginaw valley research and extension centre. Frankenmuth, MI. Jun 5, 2017. 22 participants

Wheat annual meeting wheat disease guide, head scab and stripe rust. Frankenmuth, MI. Mar 14, 2017. 303 participants

Wheat stripe rust in 2016: moving forward. Great Lakes Crop Summit. Mt Pleasant, MI. Jan 25, 2017. 62 participants

Fantastic Fungicides! SouthWest Agricultural Conference. Ridgetown, ON, Canada. Jan 4-5, 2017. 3 sessions total of 270 participants

**NCERA 184 Small grains pathology- MN State Report 2017**

M. Smith and R. Dill-Macky

**MN 2017 Growing Season**

In 2017 acreages of small grains dropped overall between 11-16% across wheat, barley and oats. This was largely due to high yields of other commodities such as corn and soybeans in 2016, encouraging farmers to adopt these commodities in 2017.

Spring wheat acres in MN in 2017 totaled 1,160,000 with 1,130,000 acres being harvested. The average yield was 67 bu/acre, which broke the previous state record of 60 bu/acre. The average price was 5.75 $/bu. Winter wheat made an appearance yet again, largely in the southern portion of the state with 10,000 acres being planted. However, only half of these acres were eventually harvested. The average price for winter wheat was 5.4 $/bu. The barely yield average was 76 bu/acre with 80,000 acres being planted in 2017. The barley price was somewhat lower at 4.35$/bu. Oat acreages were higher than that of barley at 170,000 planted acres. Oats yielded on average 75 bu/acre at 2.25$/bu.

In April, the environment was not consistent enough for much planting to occur. However, changes in May meant that by the third week of May the majority of the small grains crop was in the ground. With the relatively late planting, there were concerns about the yield potential of the crop, however, other than short stature noted for some spring wheat varieties, this did not affect yield in the slightest.

Towards the end of July it was clear that many areas were starting to struggle for sub surface moisture, particularly in Northwest MN. Due to the dryer conditions, disease issues were much fewer. Tan spot was present early in the season. Although there were some early reports of stripe rust in research plots in southern MN, this disease did not take hold in commercial fields due to lack of leaf surface moisture required for infection. High humidity prior to grain fill saw many filed subject to awn infections by FHB however, in many areas these infections did not progress due to dryer conditions in the later part of June and early July. Drier conditions also meant that growers were able to go out and apply fungicide at early flowering to provide maximum control for FHB. This meant that overall FHB did not take hold in many fields. Barley yellow dwarf was apparent in fields due to early influxes of aphids. In some cases aphids had infected plants early enough to initiate stunting of plants. However, these more severe symptoms did not appear to be widespread. By far the most notable disease in 2017 was again bacterial leaf streak. Many growers were unaware of this issue until after heading when symptoms such as necrosis became far more apparent. In drier areas BLS did not take such a hold, probably because lack of rain prevented wider distribution of the disease.owever, by the end of may, tha t majority of the However, change in conditions in May menat that by the third week of May planting was largely complete.

**Research Publications**

## Hjelkrem, A. G. R., Torp, T., Brodal, G., Aamot, H. U., Strand, E., Nordskog, B., Dill-Macky, R., Edwards, S. G. & Hofgaard, I. S. (2017) DON content in oat grains in Norway related to weather conditions at different growth stages*. European Journal of Plant Pathology*. 148, 3, p. 577-594 18 p.

Nazareno, E. S., Li, F., **Smith, M**., Park, R. F., Kianian, S. F., and Figueroa, M. (2017). Puccinia coronata f. sp. avenae: a threat to global oat production. *Molecular plant pathology*. DOI 10.1111/mpp.12608

J.A. Anderson, J.J. Wiersma, G.L. Linkert, S. Reynolds, J.A. Kolmer, Y. Jin, M. Rouse, **R. Dill-Macky, M.J. Smith,** G.A. Hareland, and J.-B. Ohm. (2017) Registration of 'Bolles' Hard Red Spring Wheat with High Grain Protein Concentration and Superior Baking Quality. *Journal of Plant registration*. Accepted.

**Extension Publications/Articles/Presentations**

**M. J.** **Smith,** Studies on Barley Yellow Dwarf in Minnesota Research Seminar Series, Department of Plant Pathology, University of Minnesota, September 18th 2017.

**M.J. Smith**, E. Byamukama, A. Friskop, K. Baron, P. Richter, T. Rabay and B. Roskins Oat Crown Rust Management Research Update. Annual Oat Rust forum, Ithaca, NY. November 16th 2017.

Fungal Disease Emerge in Wheat but Fungicide Might Need to Wait. Feature article in MN Farm News, June 28th, 2017. <http://www.agupdate.com/crops/fungal-diseases-emerge-in-wheat-but-fungicide-might-need-to/article_58916ef4-6106-5b12-b157-de26a7e53afb.html>

‘Don’t Use Fungicide as Insurance on Small Grains’ Brownfield Ag News June 6th 2017’ <https://brownfieldagnews.com/news/dont-use-fungicide-insurance-small-grains/>

**NCERA 184 Report, Missouri, 2017**

By Kaitlyn Bissonnette

Missouri small grains report – 2017 growing season

In Missouri, 640,000 acres of wheat planted in 2017, and 540,000 were harvested with approximately 99% of that acreage in the soft red winter wheat class. A cold, wet spring lead to some freeze damage and flooding in parts of the state, likely contributing to the reductions in harvested acres. Overall, disease reports were minimal with scab incidence and severity being relatively low in 2017. Leaf rust and stripe rust were sporadic and primarily variety dependent. BYDV was more common amongst average producers. Some issues with bacterial leaf stripe/black chaff were also reported anecdotally.

The following publication is from research out of the University of Illinois under the direction of Carl Bradley, so it might be repeated in his report:

Bissonnette, K. M., Kolb, F. L., Ames, K. A., Bradley, C. A. 2018. Effect of Fusarium head blight management practices on mycotoxin contamination of wheat straw. Plant Disease. First Look. DOI: 10.1094/PDIS-09-17-1385-RE

**2017 Nebraska Report – NCERA 184**

Stephen Wegulo, Extension Plant Pathologist, University of Nebraska-Lincoln

**University of Nebraska-Lincoln personnel involved in wheat disease extension and**

**research**: Stephen Wegulo, Tony Adesemoye, Janelle Millhouse, Julie Stevens

**2017 Wheat Production and Major Diseases in Nebraska**

In Nebraska in 2017, winter wheat harvested was approximately 47 million bushels

compared to 71 million bushels in 2016. Area harvested for grain totaled 1.02 million

acres compared to 1.31 million acres in 2016. Planted area was 1.12 million acres

compared to 1.37 million acres in 2016. Yield was 46 bushels per acre compared to 54

bushels per acre in 2016. The decline in production in 2017 compared to 2016 was partly

due to severe epidemics of wheat streak mosaic especially in western Nebraska where the

majority of wheat is produced, and moderate to severe levels of stripe rust throughout the

state in fields that were not sprayed.

During the 2017 wheat growing season, the main diseases were wheat streak mosaic and

stripe rust. Fusarium head blight (FHB) was minimal in all FHB-prone wheat-growing

regions of the state.  Both incidence and severity of FHB in individual growers’ fields

were trace to low and DON levels were minimal or negligible. Leaf rust developed to

moderate to severe levels in some fields that were not sprayed, but was not as widespread

as stripe rust. Low to moderate levels of Septoria tritici blotch, tan spot, and powdery

mildew were present in some fields that were not sprayed.

**Impact Statements**

1. Participated in and presented at the 2017 Crop Production Clinics. Estimated

impact: $2.6 million to Nebraska wheat production.

2. Participated in and presented at 7 wheat field days. Estimated impact: $7 million.

3. Disseminated wheat disease management information through the CropWatch

newsletter, Market journal TV, KRVN radio, and the Nebraska Farmer magazine.

Estimated impact: $8 million

4. Conducted 8 wheat disease surveys and disseminated information from the surveys

through the CropWatch newsletter. Estimated impact: $6 million.

**Research Publications, Book Chapters, and Extension Newsletter Articles**

Research Publications:

1. Wosula, E. N., Tatineni, S., Wegulo, S. N., and Hein, G. L. 2017. Effect of

temperature on wheat streak mosaic disease development in winter wheat. Plant Dis.

101:324-330

2. Wosula, E. N., McMechan, A. J., Knoell, E., Tatineni, S., Wegulo, S. N., and Hein,G. L. 2018. Impact of timing and method of virus inoculation on the severity ofwheat streak mosaic disease. Plant Dis. 102:645-650.

3. Takemoto, J. Y., Wegulo, S. N., Yuen, G. Y., Stevens, J. A., Jochum, C. C., Chang,

C-W. T., Kawasaki, Y., and Miller, G. W. 2018. Suppression of wheat Fusarium

head blight by a novel amphiphilic aminoglycoside fungicide K20. Fungal Biol. In

press.

https://reader.elsevier.com/reader/sd/00CC53C5B693C751B0233AC96EDFD74D0E

F1B56705B2139AB95A3CC0FAA22F16CF20D902197322874A77777788C7DC19

4. Bhatta, M., Regassa, T., Wegulo, S. N., and Baenziger, P. S. 2018. Foliar fungicide

effects on disease severity, yield, and agronomic characteristics of modern winter

wheat genotypes. Agron. J. 110:1-9.

5. Singh, K., Wegulo, S. N., Skoracka, A., and Kundu, J. K. 2018. Wheat streak mosaic

virus: a century old virus with rising importance worldwide. Mol. Plant Pathol. In

press.

6. Mourad, A. M. I., Sallam, A., Belamkar, V., Wegulo, S., Bowden, R., Jin, Y.,

Mahdy, E., Bakheit, B., El-Wafaaa, A. A., Poland, J., and Baenziger, P.S. 2018.

Genome-wide association study for identification and validation of novel SNP

markers for Sr6 stem rust resistance gene in bread wheat. Front. Plant Sci. 9:1-12.

Book Chapters:

1. **Wegulo, S.N. 2017.** Integrated wheat disease management. Pages 417-441 in:

Achieving Sustainable Cultivation of Wheat Vol. I. P. Langridge (Ed.). Burleigh

Dodds Science Publishing, Cambridge, UK.

Extension Newsletter Articles:

1. Creech, C., Hein, H., Bradshaw, J., and **Wegulo, S. 2017**. Growers urged to keep a

watchful eye for wheat viruses this spring. CropWatch. Jan 25.

2. **Wegulo, S. 2017**. Start scouting for wheat diseases. CropWatch. March 24.

3. **Wegulo, S. 2017**. Wheat disease update. CropWatch. April 7.

4. **Wegulo, S. 2017**. Wheat disease update: stripe rust confirmed in Nebraska; wheat

streak mosaic found. CropWatch. April 21.

5. Klein, R., Creech, C., Baenziger, P.S., and **Wegulo, S. 2017**. Assessing Freeze

Injury to Wheat. CropWatch. April 27.

6. **Wegulo, S. 2017**. Stripe rust confirmed in wheat in south central and southeast

Nebraska; other diseases increasing. CropWatch. April 28.

7. **Wegulo, S. 2017.** Wheat update: leaf rust confirmed, stripe rust widespread but at

low levels. CropWatch. May 8.

8. **Wegulo, S. 2017**. Wheat disease update in eastern Nebraska. CropWatch. May 12.

9. **Wegulo, S. 2017.** Wheat disease update: wheat streak mosaic. CropWatch. May 19.

10. **Wegulo, S. 2017.** Stripe rust increasing in Nebraska wheat. CropWatch. May 25.

11. **Wegulo, S. 2017**. Wheat disease update: stripe rust, leaf rust, wheat streak mosaic at

high levels. CropWatch. June 9.

12. Klein, R., Werle, R., Creech, C., Bradshaw, J., **Wegulo, S.**, Hein, G., Adesemoye, T.,

and McMechan., J. 2017. Why control of volunteer wheat is critical to protecting

2018 yields. CropWatch. July 13.

13. **Wegulo, S. 2017**. The importance of certified, fungicide-treated wheat seed.

CropWatch. July 31.

14. Creech, C., Hein, G., **Wegulo, S.,** Bradshaw, J., and McMechan, J. 2017. Protect

future wheat yields: control the volunteer green bridge. CropWatch. August 2.

15. Harveson, R., and **Wegulo, S**. 2017. 5 Pre-planting steps to reduce disease problems

in wheat. CropWatch. August 28.

16. **Wegulo, S.** 2017. Risk factors and management recommendations for wheat

diseases in Nebraska. CropWatch. August 30.

**NCERA-184, Diseases of Small Grains**

**New York (Cornell University) Report 2017**

March 5, 2018

Pensacola Beach, FL

**Personnel:** Gary Bergstrom, Professor

Jaime Cummings, Research Support Specialist

Alyssa Blachez, M.S. Student (finished M.S. in 2017)

Michael Fulcher, Ph.D. Student

Shawn Kenaley, Research Associate

Kevin Myers, Research Technician

**2017 Crop Season in Review:**

The growing season was conducive for good yield of small grains in New York. Winter wheat was harvested from 125,000 acres and average wheat yield was 67 bu/A, while many leading producers topped 100 bu/A. Spring oat was harvested from 35,000 acres and average yield was 55 bu/A. Malting barley, a combination of winter and spring cultivars, was harvested from an estimated 2,000 acres and the overall quality for malting was excellent. Despite record rainfall in May and June, diseases were not a determining factor in small grain yields in 2017. Fusarium head blight and deoxynivalenol contamination were generally at low levels in wheat and barley. Severe local epidemics of crown rust occurred in spring oat.

**Research Impacts:**

* Oat varieties once categorized as resistant to crown rust are no longer resistant to populations of the crown rust fungus in New York; ‘Hayden’ oat is recommended to New York producers as the best choice of available oat variety in 2018 that is still resistant to crown rust in New York testing locations.
* A novel leaf spotting disease of wheat, confirmed in four counties of New York to be caused by a fungus in the *Alternaria infectoria* species complex, could be of national and international significance for wheat production. As research on the causal fungus and its management proceed in New York, wheat samples with similar foliar symptoms (scald-like lesions with tan centers and dark borders) are sought by the Bergstrom Lab (APHIS permit available) to conduct further molecular phylogeny and establish the geographic range of the pathogen.

**Current Small Grains Pathology Research Projects:**

* Foliar fungicide product evaluation in wheat and malting barley
* Integrated management of FHB in wheat and malting barley
* Epidemiology of FHB – contribution of in-field vs. regional inoculum sources
* Population ecology and genetics of *Fusarium graminearum*
* Resistance of *Fusarium graminearum* to triazole fungicides
* Assessment of *Fusarium* mycotoxin chemotypes statewide
* Cultivar evaluation for various diseases in wheat, barley, oat, rye, and ancient grains
* Disease survey in commercial malting barley fields
* Assessment of *Fusarium* viability/mycotoxins pre- and post-malting

**Publications in 2017:**

Blachez, 2017. *Assessment of Malting Barley Varieties for Resistance to Important Barley Diseases in New York*. M.S. Thesis, Cornell University, Ithaca, NY

Cummings, J.A., K. Myers, A.F. Blachez, and G.C. Bergstrom. 2017. First report of Fusarium head blight caused by *Fusarium cerealis* in barley in New York. *Plant Dis.* 101:1955. <https://doi.org/10.1094/PDIS-05-17-0752-PDN>

Kenaley, S.C., G. Ecker, and G.C. Bergstrom. 2017. First report of *Puccinia coronata* var. *coronata* sensu stricto infecting alder buckthorn in the United States. Plant Health Progress May 2017 <https://doi:10.1094/PHP-01-17-0003-BR>

Fulcher, M.R., J.A. Cummings, and G.C. Bergstrom. 2017. First report of an Alternaria leaf spot of wheat in the USA. *Plant Dis.*101: 1326. <https://doi.org/10.1094/PDIS-10-16-1541-PDN>

Del Ponte, E.M., B. Valent, and G.C. Bergstrom. 2017. Fusarium head blight and wheat blast: Status in 2016. *Tropical Plant Pathology* 42:143-145. doi:10.1007/s40858-017-0166-0 <https://link.springer.com/article/10.1007/s40858-017-0166-0>

Juliana, P., R.P. Singh, P.K. Singh, J. Crossa, J. Huerta-Espino, C. Lan, S. Bhavani, J.E. Rutkowski, J.A. Poland, G.C. Bergstrom, and M.E. Sorrells. 2017. Genomic and pedigree based prediction for leaf rust, stem rust, and stripe rust resistance in wheat. *Theor. Appl. Genet.* 130: 1415-1430. doi:10.1007/s00122-017-2897-1 <https://link.springer.com/article/10.1007/s00122-017-2897-1>

Juliana, P., R.P. Singh, P.K. Singh, J. Crossa, S. Singh, J.E. Rutkowski, J.A. Poland, G.C. Bergstrom, and M.E. Sorrells. 2017. Comparison of models and whole-genome profiling approaches for prediction of Septoria tritici blotch, Stagonospora nodorum blotch and tan spot resistance in wheat. *The Plant Genome* Vol 10, July 2017. doi:10.3835/plantgenome2016.08.0082 <https://dl.sciencesocieties.org/publications/tpg/articles/0/0/plantgenome2016.08.0082> Blachez, A.F., G.C. Bergstrom, D. Benscher, and M.E. Sorrells. 2017. Evaluation of foliar diseases on spring malting barley varieties in New York, 2016. Plant Disease Management Reports 11: CF025.

Blachez, A.F., G.C. Bergstrom, D. Benscher, and M.E. Sorrells. 2017. Evaluation of foliar diseases on winter malting barley varieties in New York, 2016. Plant Disease Management Reports 11: CF026.

Cummings, J.A., G.C. Bergstrom, R.J. Richtmyer, and R.R. Hahn. 2017. Evaluation of integrated methods for management of Fusarium head blight and foliar diseases of winter wheat in New York, 2016. Plant Disease Management Reports 11: CF030.

Cummings, J.A., G.C. Bergstrom, R.J. Richtmyer, and R.R. Hahn. 2017. Evaluation of foliar fungicides for control of Fusarium head blight and foliar diseases of spring malting barley in New York, 2016. Plant Disease Management Reports 11: CF018.

Cummings, J.A., G.C. Bergstrom, R.J. Richtmyer, and R.R. Hahn. 2017. Evaluation of organic foliar fungicides for control of Fusarium head blight and foliar diseases of spring malting barley in New York, 2016. Plant Disease Management Reports 11: CF001.

Cummings, J.A., G.C. Bergstrom, R.J. Richtmyer, and R.R. Hahn. 2017. Evaluation of integrated methods for management of Fusarium head blight and foliar diseases of spring malting barley in New York, 2016. Plant Disease Management Reports 11: CF019.

Cummings, J.A., G.C. Bergstrom, R.J. Richtmyer, and R.R. Hahn. 2017. Evaluation of integrated methods for management of Fusarium head blight and foliar diseases of winter malting barley in New York, 2016. Plant Disease Management Reports 11: CF029.

Fulcher, M.R., G.C. Bergstrom, D. Benscher, M.E. Sorrells, and J. O’Dea. 2017. Evaluation of foliar and spike diseases on spring wheat and malting barley varieties in eastern New York, 2016. Plant Disease Management Reports 11: CF023.

Fulcher, M.R., G.C. Bergstrom, D. Benscher, and M.E. Sorrells,. 2017. Evaluation of stripe rust on winter wheat varieties and breeding lines in New York, 2016. Plant Disease Management Reports 11: CF024.

Tang, Ruoling, Z. Jin, J. Gillespie, J. Barr, T. Gross, J. Cummings, J. Wiersma, G. Bergstrom, R. Brueggeman, and P. Schwarz. 2017. Growth of *Fusarium graminearum* and production of deoxynivalenol during the malting of winter rye and triticale. Pages 20-25 in S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proc. 2017 National Fusarium Head Blight Forum. East Lansing, MI/Lexington, KY: U.S. Wheat and Barley Scab Research Initiative.

Salgado, J.D., G. Bergstrom, C. Bradley, K. Bowen, E. Bycamukama, A. Byrne, A. Collins, C. Cowger, J. Cummings, V. Chapara, M.I. Chilvers, R. Dill-Mackey, H.M. Darby, A. Friskop, P. Gautam, N. Kleczewski, L.V. Madden, J. Marshall, H. Mehl, M. Nagelkirk, J. Stevens, D. Smith, S. Wegulo, K. Wise, D. Yabwalo, H.M. Heather-Kelly, and P.A. Paul. 2015. Efficacy of two-treatment fungicide programs for FHB management: A multi-state coordinated project. Pages 20-25 in S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proc. 2017 National Fusarium Head Blight Forum. East Lansing, MI/Lexington, KY: U.S. Wheat and Barley Scab Research Initiative.

Salgado, J.D., K. Ames, G. Bergstrom, C. Bradley, E. Byamukama, J. Cummings, V. Chapara, M.I. Chilvers, R. Dill-Macky, A. Friskop, P. Gautam, N. Kleczewski, L.V. Madden, E. Milus, M. Nagelkirk, J. Ransom, K. Ruden, J. Stevens, S. Wegulo, K. Wise, D. Yabwalo, and P.A. Paul. 2017. Robust management programs to minimize losses due to Fusarium head blight and deoxynivalenol in wheat. Pages 26-27 in S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proc. 2017 National Fusarium Head Blight Forum. East Lansing, MI/Lexington, KY: U.S. Wheat and Barley Scab Research Initiative.

Fulcher, M.R., and G.C. Bergstrom. 2017. Prevalence of *Fusarium graminearum* in non-cultivated, gramineous reservoirs. Page 13 in S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proc. 2017 National Fusarium Head Blight Forum. East Lansing, MI/Lexington, KY: U.S. Wheat and Barley Scab Research Initiative.

Fulcher, M.R., J.B. Winans, and G.C. Bergstrom. 2017. Bases of variable sensitivity to tebuconazole in New York isolates of *Fusarium graminearium*. Page 65 in S. Canty, B. Wiermer, and D. Van Sanford (Eds.), Proc. 2017 National Fusarium Head Blight Forum. East Lansing, MI/Lexington, KY: U.S. Wheat and Barley Scab Research Initiative.

Fulcher, M.R., J.A. Cummings, and G.C. Bergstrom 2017. Alternaria leaf spot of wheat in New York. What’s Cropping Up Volume 27 No. 3: 3-4. <http://blogs.cornell.edu/whatscroppingup/2017/06/02/alternaria-leaf-spot-of-wheat-in-new-york/>

Bergstrom, G.C. and M.R. Fulcher. 2017. Stripe rust: A new challenge to wheat yield in New York.Volume 27 No. 3:1-2. <http://blogs.cornell.edu/whatscroppingup/2017/06/06/stripe-rust-a-new-challenge-to-wheat-yield-in-new-york/>

**2017-18 NCERA-184 State Report – North Dakota**

Andrew Friskop, Cereal Crop Extension Plant Pathologist, North Dakota State University

Scott Meyer, Research Technician, NDSU

Jessica Halvorson, Research Specialist, NDSU

Elizabeth Crane, Research Specialist, NDSU

**Hard Red Spring Wheat**

Hard red spring wheat was harvested on approximately 5 million acres in 2017, down significantly from 2016. Most of the acreage drop was due to very dry conditions in western ND. Tan spot was the most prevalent disease according to the Integrated Pest Management Survey that is conducted throughout the growing season. Stripe rust was detected on May 29 in western ND. However, the environmental conditions (low occurrences of prolonged moisture periods) inhibited stripe rust development for the state. The greatest amount of FHB risk occurred in northeast North Dakota, however elevated risk did not coincide with flowering of the spring wheat crop in this area.

**Hard Red Winter Wheat**

Winter wheat acreage continues to decrease in the state of ND and last year only 60,000 acres were seeded. Residue-borne fungal leaf spots continue to be the most problematic disease as most winter wheat is seeded into wheat stubble.

**Durum**

A total of 1.2 million acres of durum were harvested in 2017. Most of the durum acreage is in northcentral and northwestern ND. This area was also impacted by the lack of precipitation and disease related problems were minimal.

**Barley**

The availability of malting contracts was reduced last year and barley was seeded on 470,000 acres in 2017. The most problematic foliar disease(s) is the net blotch complex. FHB and DON problems were not widely observed in 2017 as most growers tend to practice IPM strategies.

**Field Research**

Foliar fungicide efficacy, timing and seed treatment trials were completed on several small grain market classes in 2017. The USWBSI integrated management trials were conducted on four small grain market classes at five locations. This information is heavily used by Extension specialists, Extension agents, crop consultants, growers and other agricultural professionals.

**Impacts**

* The NCERA-184 Fungicide Efficacy table was distributed to county agents, growers, and other agricultural professionals in 2017-2018.
* Timely commentary was provided on the national FHB prediction model website and the NDSU Small Grains Disease Forecasting Model.

**Research Publications:**

Bauske, E., Halvorson, J., Meyer, S., Chapara, V., Arens, A., Kalil, A., Fonseka, D., and Friskop, A. 2017. Integrated management of Fusarium head blight in durum varieties. 2017 National FHB Forum. Milwaukee, WI. December 3-5, 2017. Proceedings of the 2017 National Fusarium Head Blight Forum, Dec. 3-5, 2017, Milwaukee, WI.  US Wheat and Barley Scab Initiative publishers, East Lansing, MI/Lexington, KY.

Halvorson, J., Bauske, E., Meyer, S., Chapara, V., Arens, A., Schatz, B., and Friskop, A. 2017. Integrated management of Fusarium head blight in hard red spring wheat varieties.

Proceedings of the 2017 National Fusarium Head Blight Forum, Dec. 3-5, 2017, Milwaukee, WI.  US Wheat and Barley Scab Initiative publishers, East Lansing, MI/Lexington, KY.

Gross, P., Chapara, V., Ransom, J., Brueggeman, R., Schatz, B., Kalil, A., Fonseka, D., Deplazes, C., Arens, A., and Friskop, A. 2017. Integrated Management Strategies to Lower Fusarium Head Blight and Deoxynivalenol in Spring Barley over Multiple Years and Locations. Proceedings of the 2017 National Fusarium Head Blight Forum, Dec. 3-5, 2017, Milwaukee, WI.  US Wheat and Barley Scab Initiative publishers, East Lansing, MI/Lexington, KY.

**Extension Publications:**

Friskop, A., Markell, S., and Khan, M. 2017. 2018 North Dakota Field Crop Plant Disease Management Guide. North Dakota Extension Service Publication PP-622.

Ransom, J., Endres, G., Forster, S., Friskop, A., Franzen, D., Zollinger, R., Howatt, K., Knodel, J., Beauzay, P., and Hellevange, K. 2017. Field Guide to Sustainable Production of High-quality Durum Wheat in North Dakota. North Dakota Extension Service Publication A1825.

Friskop, A. and Ransom, J. 2017. Deoxynivalenol (DON) in Small Grains. North Dakota Extension Serve Publication PP1302.

Ransom, J., Green, A., Simsek, S., Friskop, A., Breiland, M., Friesen, T., Liu, Z., Zhong, S., Rickertsen, J., Eriksmoen, E., Hanson, B., Martin, G., Pradhan, G., Ostlie, M. 2017. North Dakota Hard Red Spring Wheat Variety Trial Results for 2017 and Selection Guide. North Dakota Cooperative Extension Service Publication A574-17.

Ransom, J., Elias, E., Friskop, A., Friesen, T., Liu, Z., Manthey, F., Rickertsen, J., Eriksmoen, E., Hanson, B., Pradhan, G., Ostlie, M. 2017. North Dakota Durum Wheat Variety Trial Results for 2017 and Selection Guide. North Dakota Cooperative Extension Service Publication A1067-17.

Ransom, J., Brueggeman, R., Horsely, R., McMullen, M., Schwarz, P., Friskop, A., Schatz, B., Zwinger, S., Ostlie, M., Martin, G., Rickertsen, J., Eriksmoen, E., Hanson, B., and Gautam, P. 2017. North Dakota Barley, Oat and Rye Variety Trial Results for 2017 and Selection Guide. North Dakota Cooperative Extension Service Publication A1049-17.

Ransom, J., Marais, F., Simsek, S., Friskop, A., Rickertsen, J., Eriksmoen, E., Hanson, B., Martin, G., Ostlie, M., Pradhan, G. 2017. North Dakota Hard Red Winter Wheat Variety Trial Results for 2017 and Selection Guide. North Dakota Cooperative Extension Service Publication A1196-17.

NDSU Extension Articles

* Scab Fungicides Under Low Disease Environments. 2017. North Dakota State University Crop and Pest Report.
* Fusarium Head Blight Risk. 2017. North Dakota State University Crop and Pest Report.
* Efficacy and Timing Questions for FHB. 2017. North Dakota State University Crop and Pest Report.
* Fusarium Head Blight Risk. 2017. North Dakota State University Crop and Pest Report.
* Wheat Leaf Disease Update. 2017. North Dakota State University Crop and Pest Report.
* Fusarium Head Blight Risk. 2017. North Dakota State University Crop and Pest Report.
* Wheat Disease Update. 2017. North Dakota State University Crop and Pest Report.
* Fusarium Head Blight Risk. 2017. North Dakota State University Crop and Pest Report.
* Small Grain Disease Update. 2017. North Dakota State University Crop and Pest Report.
* Stripe Rust in North Dakota. 2017. North Dakota State University Crop and Pest Report.
* Wheat Streak Update and Other Causes of Yellowing Wheat. 2017. North Dakota State University Crop and Pest Report.
* Early Season Fungicide Application for Wheat. 2017. North Dakota State University Crop and Pest Report.
* NDSU Small Grain Disease Forecasting Site and Twitter. 2017. North Dakota State University Crop and Pest Report.
* New Publications and App Updates. 2017. North Dakota State University Crop and Pest Report.
* Discolorations and Pathogens Associated with Wheat Kernels. 2017. North Dakota State University Crop and Pest Report.

**Pennsylvania State Report, 2017**

Dr. Paul Esker, [pde6@psu.edu](mailto:pde6@psu.edu)

Dr. Alyssa Collins, [aac18@psu.edu](mailto:aac18@psu.edu)

Wheat production in Pennsylvania in 2017 was: 210,000 acres planted, 150,000 harvested acres, with an average yield of 72 bushels per acre. Yield was 4 bushels per acre higher than in 2016 and harvested acres were similar between the two yields. Economically the wheat crop value was approximately $55 to 60 million.

The greater wheat growing regions of Pennsylvania experienced unusually cool and relatively dry conditions during the majority of the flowering period.  The weather began to warm and rains became more frequent at the end of May, putting those growers with late flowering wheat at higher risk for infection.  Overall, wheat yields and quality were much improved over recent years due to good management, cooperative weather, and timely harvests.  Where detectable, levels of DON were relatively low.

We experienced generally low levels of powdery mildew and leaf blotches until later in the season (flag leaf —> onward).   Higher levels of stripe rust were seen in 2017 than in previous years, but not developing early enough to cause serious economic damage.  Some of the less-frequent diseases, like Cephalosporium stripe, were reported more frequently last year.

**2017 Tennessee Report – NCERA 184**

Heather M. Kelly, Extension/Research Plant Pathologist, University of Tennessee

**University of Tennessee personnel involved in wheat disease extension and research:** Heather Kelly, Tyson Raper, Rachel Guyer, Wesley Crowder

**2016-2017 Wheat Production and Major Diseases in Tennessee**

In Tennessee a total of 370,000 acres of soft, red winter wheat was planted with 275,000 harvested. A total of 19.25 million bushels produced with an average of 70 bu/A.

In 2017 disease development was minimal, on average, across the state. Moderate, wet weather that turned warm and drier as the season progressed was not conducive for any rust epidemics although there were a few reports of stripe rust that were managed and some late season reports of leaf rust. Septoria/Stagonospora blotch complex was common but mainly just in the lower canopies. Few reports of powdery mildew were recorded. Fusarium head blight was average and depended heavily upon location, weather, variety, and if fungicide was applied at bloom. Viruses such as Barley Yellow Dwarf were detected at normal levels.

**Impact Statements**

1. Research activities focused on fungicide timing and efficacy trials on common wheat diseases in Tennessee. In addition, fungicide applications at bloom were implemented to evaluate the performance of the Fusarium head blight prediction tool. Data were shared with producers and growers at local and regional meetings as well as local publications and websites.
2. Updated wheat quick facts sheet for printing and viewing
3. Updated wheat fungicide efficacy table for printing and viewing

**Research Publications, Extension Articles, and Videos**

Extension/Outreach presentations (*Total of 12, with over 500 contacts*)

* East TN Grain Conference – soybean and wheat disease update 1/18/2017
* Obion Farm School – Soybean and wheat disease update 2/9/2017
* Wheat Disease Management Update at 10 county production meetings

[News.UTcrops.com](https://liveutk-my.sharepoint.com/personal/hyoung13_utk_edu/Documents/UT%20Docs/Wheat/News.UTcrops.com) (newsletter/blog)

[Wheat Disease Update](http://news.utcrops.com/2017/04/wheat-disease-update-april-13-2017/) - April 13, 2017

[Fungicide considerations and disease identification in wheat](http://news.utcrops.com/2017/04/fungicide-considerations-disease-identification-wheat/) – April 3, 2017

**Kelly, H.** 2017. W 341 [Wheat Fungicide Efficacy Table](https://extension.tennessee.edu/publications/Documents/W341.pdf). UT Extension, Wheat disease management information.

Raper, T., Verbree, D., and **Kelly, H.** 2014. [W321 2014 Tennessee Wheat Quick Facts](http://news.utcrops.com/wp-content/uploads/2014/10/W-321.pdf). UT Extension, Disease Management information. Updated in 2015.

**2018 Virginia Report - NCERA 184**

Hillary L. Mehl, Extension Plant Pathologist

**Virginia Tech Tidewater AREC personnel involved in wheat disease management research and extension:**

Hillary Mehl, Linda Byrd-Masters, Steve Byrum, Ed Hobbs, Navjot Kaur.

**2017 wheat production and major diseases**

In 2017, wheat was planted on approximately 210,000 acres which was similar acreage to 2016. However, due tofreeze damage and other factors, wheat was only harvested from 145,000 acres in Virginia, a decrease of 30,000acres compared to 2016. A total of 9.57 million bushels of winter wheat were harvested in 2017 with an average yield of 66 bu/A, a 13 bu/A increase over 2016.

Fall planting conditions were generally good in 2016. Frequent rainfall in early spring led to stripe rust outbreaks in early April. A majority of the early outbreaks occurred on the Eastern Shore of Virginia. In most cases, the disease was found on the variety Shirley, which based on observations in previous years in known to be highly susceptible to stripe rut. High levels of stripe rust were observed by the end of the growing season. Powdery mildew occurred sporadically across the state, and some leaf blotch complex was observed in most fields. Overall, scab and DONwere low in 2017 with a few sporadic instances of disease and mycotoxin contamination. Disease pressure was highest on the Eastern Shore of Virginia, but scab risk remained low in other regions of the state for most of the growing season. Dry weather prior to flowering likely reduced the amount of inoculum in fields during the susceptible flowering stages of the crop. Dry weather also delayed the need for fungicide applications for foliar diseases, so in many fields a flowering application of a triazole fungicide was made to control both foliar and head diseases. The majority of Virginia’s 2017 wheat crop had DON levels below 1.0 ppm.

**Activities & Outputs**

1. Disease alerts and management recommendations were disseminated to producers, Extension agents, and crop consultants through the Virginia Ag Pest and Crop Advisory and the FHB alert system.

2. Efficacy of foliar fungicides and resistant varieties for management of FHB and foliar diseases was assessed and data were disseminated to growers, Extension agents, and crop consultants.

3. Wheat disease management information was presented at field days and producer meetings throughout the state.

**Publications and Presentations**

Sylvester, P. N., Lana, F. D., Mehl, H. L., Collins, A. A., Paul, P. A., &amp; Kleczewski, N. M. 2018. Evaluating the Profitability of foliar fungicide programs in mid-Atlantic soft-red winter wheat production. Plant Disease. In Press.

McMaster, N., Grothe, J., Acharya, B., Mehl, H., &amp; Schmale, D. G. 2017. Stable isotope dilution analysis for theaccurate determination of deoxynivalenol in sorghum by GC-MS.. In 2017 USWBSI Meeting. Milwaukee,WI.

Kaur, N., Byrd-Masters, L., &amp; Mehl, H. L. 2017. Integrated management of Fusuarium head blight (FHB) and DON contamination in soft red winter wheat in Virginia. Virginia Tech PPWS Graduate Student Symposium.Poster.

Griffey, C. A., Thomason, W., Seago, J., Pitman, R., Brasier, K., Carpenter, N., Ward, B., Brooks, W., Malla, S.,Liu, L., Rucker, E., Schmale, D., McMaster, N., Vaughn, M., Fitzgerald, J., Dunaway, D., Barrack, C.,Balota, M., Oakes, J., and Mehl, H. 2017. Wheat production and research in the Commonwealth of Virginiain 2016. Annual Wheat Newsletter 63. Retrieved from <http://wheat.pw.usda.gov/ggpages/awn/>

**Wisconsin NCERA 184 report for 2017**

**Scientist(s):** Damon Smith, Shawn Conley, Brian Hudelson

**State:** Wisconsin

**Date:** March 9, 2018

**Project Title:** **Wheat Disease Committee**

If your program contributed to one of the objectives below in 2017 please provide brief statement below relevant objective(s).

1. Better characterize best management practices for Fusarium Head Blight and leaf diseases in wheat and barley  
   Comments: See impact Statement below
2. Conduct fungicide efficacy trials for diseases in small grains  
   Comments: The Wisconsin Field Crop Pathology program continues to conduct fungicide efficacy trials each year to track the utility of existing treatments, identify new products with efficacy, and to develop management recommendations for Wisconsin.
3. Improve disease management through forecasting tools  
   Comments: The Wisconsin Field Crops Pathology program continues to evaluate the utility of the FHB forecasting tool in Wisconsin. We continue to participate in multi-state evaluations of the tool.

**Impact Statements:**

Provide brief paragraph of how your program impacted the management of soybean diseases in your state.

#1) Better characterize best management practices for Fusarium Head Blight and leaf diseases in wheat and barley

*Puccinia striiformis* f. sp. *tritici (Pst)* is the causal agent of stripe rust and is one of the most problematic pathogens of winter and spring wheat in the United States. Planting resistant cultivars and applying foliar fungicides are common management practices to control for this pathogen. In a two-year study in Wisconsin, two fungicides applied at three growth stages were tested on three soft red winter wheat cultivars varying in levels of resistance to stripe rust. Both fungicides (prothioconazole + tebuconazole and pyraclostrobin) applied at Feekes 8 and 10 reduced disease index (DX) and increased yield compared with the non-treated control in susceptible (Pro Seed 420) and moderately susceptible cultivars (Kaskaskia). The highly resistant cultivar (Pro Seed 380), had the highest yields and fungicide treatments had no effect on disease levels. In an accompanying study, planted with susceptible cultivar ‘Pro Seed 420’ was conducted to assess disease development and potential of overwintering of *Pst* in Wisconsin. *Puccinia striiformis* f. sp. *tritici* was found to survive over the 2016/2017 winter. This study confirmed that resistance and properly timed fungicide applications play a crucial role in managing stripe rust on winter wheat. This study also demonstrated that *Pst* can overwinterin Wisconsin and the impact of this occurrence should be examined further.

**Publications: (since last report)**

**Research Publications**

1. Mueller, B.D., Groves, C.L., Holtz, D. Deutsch, A., and Smith, D.L. 2018. First report of *Fusarium culmorum* causing Fusarium head blight of wheat in Wisconsin. *Accepted in Plant Disease in December 2017.*
2. Mueller, B., Smith, D.L., and Chapman, S. 2017. Evaluation of foliar fungicides for control of leaf rust of wheat in Wisconsin, 2016. Plant Disease Management Reports 11:CF031.
3. Mueller, B., Chapman, S., Conley, S., and Smith, D.L. 2017. Integrated management of stripe rust of winter wheat in Wisconsin. Phytopathology 107:S5.42*.*

**Published Proceedings**

1. Mueller, B., Chapman, S., Conley, S.P., and, Smith, D.L. 2017. Integrated management of stripe rust of wheat in Wisconsin. Proceedings of the 2017 Wisconsin Agribusiness Classic. Vol 1:18-22.

**Extension Fact Sheets**

1. Broeske, M., Arriaga, F.J., Jensen, B.M., Laboski, C., Lauer, J.G., Luck, B.D., and Smith, D.L. 2017. *Grain management considerations in low-margin years*. University of Wisconsin-Extension, Cooperative Extension Publication, A4137.
2. Conley, S., Roth, A, Gaska, J., Mueller, B., Smith, D. 2017. *Wisconsin Winter Wheat Performance Tests*, University of Wisconsin-Madison, Cooperative Extension (A3868).

**Extension Newsletter Publications**

1. Smith, D.L. and Mueller, B. 2017. Wisconsin winter wheat disease update – June 30. *Wisconsin Crop Manager* 24(16):84.
2. Smith, D.L. and Mueller, B. 2017. Wisconsin winter wheat disease update – June 2. *Wisconsin Crop Manager* 24(12):65.
3. Smith, D.L. and Mueller, B. 2017. Wisconsin winter wheat disease update – May 28. *Wisconsin Crop Manager* 24(11):58.
4. Smith, D.L. and Mueller, B. 2017. Wisconsin winter wheat disease update – May 2. *Wisconsin Crop Manager* 24(8):42.
5. Smith, D.L. and Mueller, B. 2017. Wisconsin winter wheat disease update – April 21. *Wisconsin Crop Manager* 24(7):34.
6. Smith, D.L. and Mueller, B. 2017. Stripe rust found to be present and active in Wisconsin winter wheat. *Wisconsin Crop Manager* 24(5):23-24