FUSARIUM FOCUS

Dedicated to Breeding New Varieties with Value-Added Benefits

This issue of *Fusarium Focus* highlights a seed company to provide increased awareness of the general priorities and perspectives of the seed industry.

U.S growers harvested nearly 450 million bushels of soft red winter wheat in 2023 and are expected to harvest 342 million in 2024. U.S. seed companies, such as Grow Pro Genetics, are dedicated to developing new varieties with improved resistance to FHB. Grow Pro Genetics is a relatively young company, starting in 2020 when a group of like-minded individuals purchased the business and breeding program from Syngenta. While the central business office is located in Bourbonnais, Illinois, it's at the primary research station, located in Hamel, Illinois, where new varieties are developed. At the research station, a four-person full-time team plus some student research staff, consultants, and service providers, work to develop new varieties using traditional and advanced breeding technologies. Activities such as variety selection, seed processing and packaging, and inventory of genetics is all happening to create new varieties with added benefits. Using integrated technology such as marker-assisted selection, inoculated and misted FHB trials, DON data, and traditional field selections new varieties are developed and released.

Once a variety has been selected for release, the company relies on dedicated seed growers to supply seed stock for production. A number of seed production companies located across the country aid the company in supplying seed to retailers and farmers.

Cody Gilman of Grow Pro Genetics plants the misted FHB nursery outside of the research station in Hamel, Illinois.

Wheat heads (right) showing fusarium head blight symptoms in a strip trial study from 2019 in Southern, Illinois.

When contracting seed, the company has many requirements. "We try to align our production partners with the right varieties, logistics, production, and sales plan," says Ken Davis, commercial director and managing partner of Grow Pro Genetics. The company works with the seed producers to help them maximize their return through the use of good agronomic practices (*i.e.* timely planting/harvest) and fungicide applications. They have found that most producers already excel in these areas and rely on Grow Pro Genetics to primarily provide them with good genetics. Newly released varieties flow into two key routes: AgriPro branded business products and private label licensing. Each channel provides its own set of products with unique features, advantages, and benefits to the growers.

The Grow Pro Genetics team has a unique opportunity to observe farming and agriculture in a wide-range of environments. By breeding wheat varieties for most of the eastern U.S., the staff observes different cultures, agronomic challenges, and market conditions. They strive to be good stewards of the technology and products while also sharing tips for success with partners.

As with all farming practices, Grow Pro Genetics is constantly challenged by weather conditions, global trade issues such as commodity prices, politics, and food security. While many of these are out of their control, they've become adept at finding value-added characteristics for their germplasm, that demonstrate a good return on investment and long-term benefits for growers.

As a breeding company, Grow Pro Genetics is passionate about intellectual property. In 2022, they created the Product Assurance System (PAS) to emphasize the use of professionally grown, high quality seed and genetics.

New Varieties, continued next page

FUSARIUM FOCUS

Fusarium Focus is an online newsletter published periodically by the U.S. Wheat & Barley Scab Initiative (USWBSI) and distributed to the USWBSI community.

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Design: Dawn Mathers

The USWBSI is a national multi-disciplinary and multi-institutional research consortium whose goal is to develop effective control measures that minimize the threat of Fusarium Head Blight (scab), including the production of mycotoxins, for producers, processors and consumers of wheat and barley. The USWBSI's annual budget comes from Federal funds appropriated through the USDA-ARS and is distributed to nearly 140 research projects in more than 30 states..

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New Varieties, continued from page 1

Aerial imagery of senescence being captured by a drone at the Grow Pro Genetics home farm in Hamel, Illinois.

> *"Our industry should continue to highlight the value being created by plant breeders giving farmers good reason to invest in wheat."*

"Our industry should continue to highlight the value being created by plant breeders giving farmers good reason to invest in wheat," said Davis. By leveraging the strength of their production partners and research team, the company is able to deliver high quality seed to retailers and growers. PAS also allows for the company's pre-commercial pipeline to release more varieties each season.

Both Davis and Allen Becker, the research director and wheat breeder at Grow Pro Genetics, serve on USWBSI committees providing perspective from the industry. Davis suggests that the USWBSI consider bringing more business presentations to the programming of the National Fusarium Head Blight Forum. "Sharing pathways for scientists to be a part of not only the research and development success but also commercial success can increase the demand for wheat exchange," said Davis. For more information about Grow Pro Genetics visit their website.

ABOUT GROW PRO GENETICS

Grow Pro Genetics was established in 2020 by a group of seed growers and investors with one thing in common, a passion for soft red winter wheat. The program's legacy began in 1914 when the Coker Pedigreed Seed Company was incorporated in Hartsville, SC. In the early 2000s, Coker and AgriPro merged forming the beginning of the breeding program. In cooperation with Syngenta, the business and breeding program was acquired by Grow Pro Genetics in 2020. The company develops soft red winter wheat genetics for the eastern U.S. growing region including 22 states, with acreage primarily in the Midwest. Their business model offers distinction, independence, and long-term value in a crowded marketplace and they are committed to sustainable economic and agronomic solutions for the seed business.

ABOUT KEN DAVIS

Ken Davis is the commercial director and the managing partner for Grow Pro Genetics and is based in Illinois. In his role as commercial director, Davis oversees business operations related to sales, production, marketing, and product communications. As managing partner, he is also responsible for the company's leadership team that focuses on outlining business strategy, administration, and reporting annual results. Currently, he is serving as the seed industry representative on the U.S. Wheat and Barley Scab Initiative's Steering Committee. ●

NWW-CP Meets in Wooster, Ohio for Mid-Year Planning Meeting

CLAY SNELLER / *The Ohio State University, VDHR-NWW CP Chair*

The Variety Development and Host Resistance Northern Winter Wheat Coordinated Project met together on May 20, 2024 in Wooster, Ohio for their midyear planning meeting. The groups objectives for the meeting were: 1) discuss our CP and breeding programs, 2) learn what all our graduate students are doing and find commonality among projects, 3) discuss the Agri-seq genotyping platform, 4) discuss budget cuts, their impacts, and our response, and 5) provide a learning opportunity in applied breeding for graduate students.

Twenty-four people were in attendance representing four universities and the USDA-ARS. Attendees included PIs, research scientists, graduate students, and post-docs with three people able to attend virtually.

Opportunity was given to 14 graduate students and post-docs to present their research. This provided a chance to learn common interests between the presenters and their projects, particularly for those working on high-throughput phenotyping with UAVs, preharvest sprouting, and genomic selection. The group had an excellent discussion around these topics.

Gina Brown-Guedira, USDA-ARS Eastern Small Grains Genotyping Lab research geneticist, presented on the use of the medium density, AgriSeq genotyping platform. She shared accuracy of various imputation methods, genomic selection prediction accuracies using AgriSeq, genotying by sequencing (GBS), and imputed data sets. The group had a lengthy discussion on how to proceed with genotyping the NWW lines since the entire budget for the genotyping was cut in FY24 due to the USWBSI's budget cut.

The attendees discussed the impact of the budget cut to each of their programs. Each PI will document the activities that were cut in order to accommodate the reduction in budget. These actions will then be reported to the EC prior to the setting of the FY25 Working Caps.

Each program (IN, IL, OH, and MI) presented their method for selecting parents and designing crosses which allowed for discussion about the different methodologies. There was also a discussion about rejuvenating the University of Missouri (MO) breeding program. Clay Sneller received 130 MO lines that are currently being grown and phenotyped as part of the FY24 funding. He was recently in contact with a former University of Missouri technician and administrator, and a visiting scholar will be attempting to restart the breeding program. There was discussion on allowing MO to enter lines into the Northern Uniform Scab Nursery even though they are unable to reciprocate phenotyping lines from other programs and given strains from the recent budget cuts.

In the afternoon, the group went on a field tour stopping to look at the Big6 test and the FHB nursery in Wooster, Ohio. The Big6 test consists of 340 lines from IL, IN, KY, MI, and NY. Attendees were tasked with rating the "appeal" of the first 140 plots. This allowed several students the opportunity to gain their first field experience and the ability to interact with four breeders and learn how each assesses wheat lines. Data from the ratings is being compiled and will be analyzed and distributed to attendees. At the FHB nursery, it was too early for symptoms to be visible but the group saw a considerable amount of foliar diseases present. The inoculation method and misting system was discussed as well as trial arrangement.

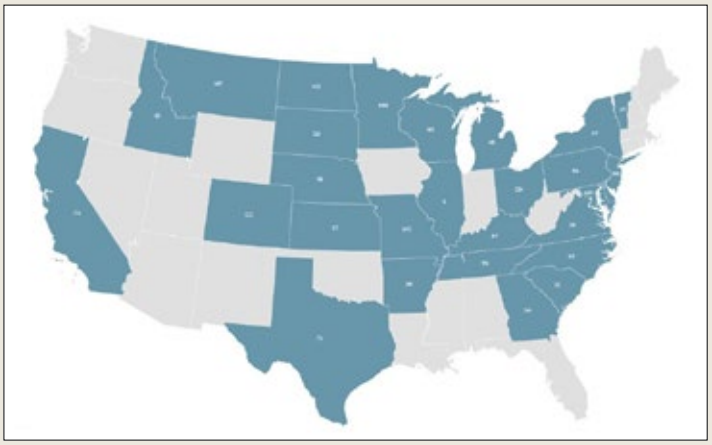
FY24 FUNDING

$1M Cut and Delayed Distribution, Stakeholders Request Restored Funding

The USWBSI FY24 funding cycle was disrupted by an unexpected modification in funding this year. At the end of April, the Executive Committee was notified that the USWBSI FY24 budget was reduced by $1M to $7.6M (previously $8.6M). The Executive Committee met in early May to deliberate how best to implement the required budget revision. Recognizing there was no way to accommodate the budget cut without a major impact, they worked toward minimizing the number of projects requiring adjustments to facilitate expeditious funding for all PIs. The USWBSI Steering Committee was notified, and an open comment period and two open forums were held to gather additional input. The final FY24 recommendation resulted in a modification to 24 projects.

The USWBSI NFO promptly notified all the PIs on the decisions and resubmitted the applications to USDA-ARS. Given the federal budget delays and the later resubmission of the adjusted projects, agreement/amendment processing is still underway by USDA-ARS. Once all is in place, there will be a total of 123 projects funded in FY24, that were selected competitively from a combination of both continuation and new projects. These projects will be implemented by 91 PIs, 84% within the Land Grant University system and 16% within USDA-ARS. Projects will be implemented in a total of 31 states, 31 universities and 10 ARS facilities.

To bring visibility to the loss of funding, USWBSI leadership has worked with the American Malting Barley Association (AMBA) and the North American Millers' Association (NAMA) to seek stakeholder support and outreach with the intent of restoring the funding for FY25. As a result, numerous FHB community stakeholders and PIs submitted their feedback to key legislators requesting the reinstatement of the full $8.6M in extramural funding for the USWBSI from the authorized appropriation of $15 million that supports *Fusarium* research of wheat and barley. The situation is continuing to be monitored and updates will be provided as more is learned about plans for the FY25 budget.



For FY24, although an unexpected modification in funding was required, projects in these 31 states will be implemented

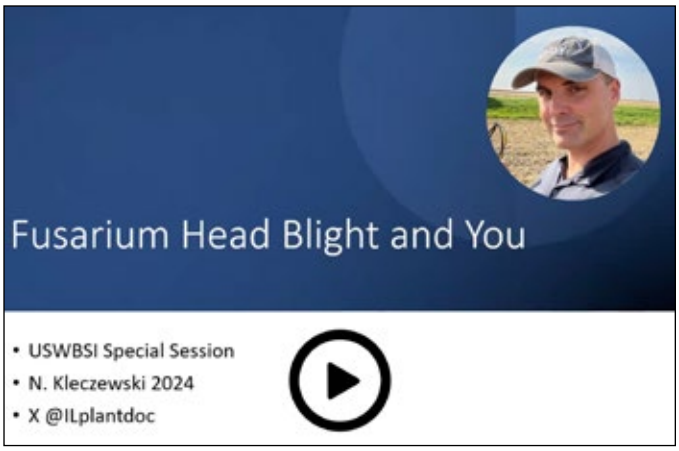
Special thanks to all the individuals who submitted their comments and made Congress aware of the critical importance of the USWBSI projects and the need to maintain current extramural funding levels. If you haven't had a chance yet to contact your representative, there still is time to impact FY25 decisions. Simply prepare a brief email in your own words on the impact and request the extramural funds be restored. If you need any assistance, contact the USWBSI NFO at nfo@scabusa.org. ●

FHB and You with Dr. Nathan Kleczewski

Eleven people tuned in on the afternoon of April 24, 2024 for the graduate students and post-docs in FHB (GPFHB) webinar with **Nathan Kleczewski**, plant pathology and entomology technical specialist/technical agronomist for GROWMARK FS, where he provided both career tips and guidance for effectively diagnosing FHB in the field.

Kleczewski first offered some tips to attendees about graduate school and a post-doctoral researcher position. He encouraged attendees to think broadly about the application of their skills, and not to focus only on what they have done thus far. "Take what you have learned and apply it to the job/career that you are most interested in. Remember, you are the valuable asset," said Kleczewski. There are more career opportunities today than when

Webinar, continued next page



Did you miss the webinar? Find it on the GPFHB webpage or the USWBSI YouTube Channel.

Webinar, continued from page 4

Kleczewski was in graduate school. He remembers a big push towards either academia or governmental positions at the time, but now there are a lot of positions in industry to consider. "Don't limit yourself," he said. "Broad training allows one to use their knowledge in a wide array of opportunities and industry is looking for applicants with a broad set of skills".

While Kleczewski hasn't always worked on FHB, he's had some really great mentors helping him along the way. He shared some information he's learned that's useful to him when aiding growers with management decisions. He noted that most growers make most of their decisions before the season begins with varieties chosen early and pesticide applications often planned days ahead of time. Scouting, he also mentioned, can help identify any insect or disease issues and allows timely applications for control to be made.

Knowing what growth stage your wheat is at can help with assessing FHB and applying fungicides. His guidance included, making sure to assess FHB when more than 50% of the population is 18-24 days post-flowering and evaluating 10 plants per location within the field for bleached portions of the spikes. "Turning the head to the side will make rating easier and faster," says Kleczewski. This technique, he noted, will provide repeatable and reliable results that will correlate with the amount of *Fusarium* damaged kernels.

Once you know the percentage of FHB in the field, he indicated, then you can assess the risk for losses. If FHB severity is more than 10%, he noted, then there is the potential for elevated DON levels and reduced yields but this still may not be a significant impact over all. If risk is severe (>25%), then he recommended to harvest as soon as possible and to make adjustments to your combine to remove tombstones and infected glumes which can contain high levels of DON. Also, make sure to dry grain to less than 15% moisture before storing.

Following the presentation, there was a chance for some great questions by those who attended. ●

COMMUNITY NEWS

UNL Wheat Tours Highlight Fusarium Risk in Dryland Production and New Prism CLP Resistant Variety

KATHERINE FRELS *and* STEPHEN WEGULO / *University of Nebraska-Lincoln*

The University of Nebraska-Lincoln (UNL) 2024 Wheat Variety Tours took place from June 6-14, 2024. The tours showcased public and private released and experimental varieties available to Nebraska producers and promoted engagement between UNL researchers, industry agronomists, and producers.

Katherine Frels highlights the need for genetic resistance to FHB as a management strategy to Nebraska growers at a recent field day.

Fusarium head blight risk was a key topic discussed across the tours this year. Wheat producers in south central and south eastern Nebraska are familiar with the disease, but most western Nebraska wheat producers are unfamiliar with the symptoms, risk, and management of FHB. The 2023 growing season brought unusual rain at heading to parts of western Nebraska triggering widespread scab symptoms. Some growers in this area saved scabby seed for fall planting which resulted in Fusarium crown and root rot. Therefore, FHB management was highlighted at nearly all tour stops.

UNL Small Grains Breeder **Katherine Frels** and UNL Plant Pathologist **Stephen Wegulo** highlighted the need to combine genetic resistance to FHB with management practices such as fungicide applications and using treated, certified seed for planting. One of the varieties recommended at the tours was the new UNL hard red winter wheat release NE Prism CLP. NE Prism CLP is a two gene Clearfield variety that also is moderately resistant to Fusarium head blight although it does not carry *Fhb1*. This variety is targeted for production in the Nebraska Panhandle and will add a new option for producers concerned about Fusarium Head Blight. More details on NE Prism CLP and the UNL Small Grains Breeding and Wheat Pathology programs were highlighted in a recent article, "Nebraska-developed Wheat Variety to Address New Fungal Threat." ●

Stephen Wegulo and a grower examine a wheat plot at a recent field day.

Photos by Lana Johnson, UNL Dept of Agronomy and Horticulture

COMMUNITY UPDATES

Welcome New Students

Chandler Day is a new PhD student with **Jessica Rupp** in the Department of Plant Pathology at Kansas State University. Day will assist with the FHB regional nursery.

Jinan Park started in the summer at Kansas State University as an M.S. student in the Department of Agronomy. Her project with **Guihua Bai** will focus on the effects of pyramiding multiple QTLs for FHB resistance in diverse genetic backgrounds.

Erin Wiegman recently started her doctorate degree with **Nidhi Rawat**, in the Department of Plant Science and Landscape Architecture at the University of Maryland. Her project will focus on genetic strategies to tackle fusarium head blight in wheat. ●

Kudos On Your New Degrees

Bhanu Dangi graduated from North Dakota State University with his master of science degree in plant sciences. His project with **Francois Marais** was on the diversification of FHB resistance quantitative trait loci in winter wheat germplasm.

Lenin Rodriguez graduated in the Summer of 2024 from The Ohio State University with his doctorate degree in horticulture and crop science. His project with **Clay Sneller** was on improving fusarium head blight resistance in soft red winter wheat using insights from toxin accumulation and genomic selection. ●

Kudos to Those Starting New Positions

Sumandeep Kaur Bazzer, Ph.D., is a new post-doctoral research associate at Texas A&M University located at the Texas A&M Research and Extension Center in Amarillo, TX. Bazzer is working with **Shuyu Liu** on pyramiding fusarium head blight resistance using doubled haploid and marker-assisted selection. ●

CALENDAR

USWBSI EVENTS

2024

December 8-10 2024 National Fusarium Head Blight Forum, Austin, TX

OTHER EVENTS

SEPTEMBER

22-27 3rd International Wheat Congress, Perth, Western Australia

OCTOBER

21-24 6th International Symposium on Fusarium Head Blight, Niagara Falls, Ontario

28-31 14th International Barley Genetics Symposium, Santa Fe, Argentina

NOVEMBER

10-13 2024 ASA, CSSA, SSA International Annual Meeting, San Antonio, TX

10-14 National Association of Wheat Growers 2024 Fall Conference, Phoenix, AZ

DECEMBER

10 American Malting Barley Association Connecting Researchers & Industry Reception, Austin, Texas

2025

JANUARY

13-16 National Association of Wheat Growers/USW Winter Conference, Washington, D.C.

FEBRUARY

26-Mar 4 National Association of Wheat Growers 2025 Annual Conference and Commodity Classic, Denver, CO

In Memory

Louis Kuster, Stanley, North Dakota, passed away on June 15, 2024. Louis served on the USWBSI's Steering Committee for 11 years having been appointed in 2013 by the U.S. Durum Growers Association. He was the fourth generation of Kuster's to live and work on the Kuster Family Farm and was active in the wheat community serving on the boards of the ND Wheat Commission, the U.S. Durum Growers Association as well as the USWBSI. The USWBSI is thankful for the dedicated service Louis provided the FHB community and sends it condolences to Louis' family, friends and colleagues. ●