



# FUSARIUM FOCUS

## ENGAGING VIRTUAL EXPERIENCE

# Increased Interactions at 2021 National Fusarium Head Blight Forum

The second ever fully online National Fusarium Head Blight Forum, which took place on December 6-7, 2021, offered the nearly 270 USWBSI community attendees from seven countries valuable updates and engaging connections. This year's event was redesigned by the USWBSI Forum Organizing Committee (FOC) to be held in two-days and incorporated several new networking events to increase attendee interactions and engagement.

**Ruth Dill-Macky**, University of Minnesota plant pathologist and U.S. Wheat and Barley Scab Initiative Researcher Co-Chair, welcomed attendees to the virtual event. Introducing the two-day line-up, Dill-Macky thanked the Forum Organizing Committee for their efforts in organizing this year's program. She also announced plans for future events noting, "This is our second year that we have been virtual, but I am really pleased to announce for 2022 we are going to be back in person."

Dill-Macky then introduced the 2021 Plenary Speakers with the Keynote presentation provided by **Paul Nicholson** (*Resisting Susceptibility to FHB*), followed by the Plenary presentation by **Xiang Yin** (*Challenges and Mitigation of Fusarium Impacts in Malting and Brewing*). Both of whose topics were the driving force for solidifying the need for genetic resistance and management strategies of FHB in wheat and barley.

Nicholson's presentation on susceptibility factors in wheat showed how investigations into the long-recognized association between plant height and FHB, identified a gene close to the *Rht-D1* gene from the spring wheat donor responsible for this association between plant height and resistance. Additionally, while barley exhibits type 2 resistance, most wheat varieties are lacking the ability to prevent the spread of the fungus throughout the spike. Nicholson's lab substituted the 4D chromosome of wheat with barley's 4H chromosome. The results showed a



Ruth Dill-Macky



Paul Nicholson



Xiang Yin



surprisingly potent effect indicating that the susceptibility of wheat is most likely due to a susceptibility factor(s) located on 4D rather than the lack of a resistance factor(s).

"With all of these susceptibility factors, it appears that what was once thought as a brutal relationship between *Fusarium*, reducing toxins, and defeating the host, is

much more sophisticated, and that wheat itself has pathways that are being subtly exploited by the pathogen and so it's complicit in some ways in its own downfall," says Nicholson in conclusion.

Yin's presentation of the issues caused from malting *Fusarium* infected grain

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## USWBSI SCABINAR

# A New Outreach Event for Growers, Crop Consultants, and Extension Professionals

Extension Plant Pathologists **Carl Bradley** (University of Kentucky), **Juliet Marshall** (University of Idaho), and **Andrew Friskop** (North Dakota State University), will be hosting a new outreach event through the U.S. Wheat and Barley Scab



Initiative. The Scabinar is intended to be a two hour webinar that provides growers, crop consultants, and extension professionals with the most up to date information on FHB, management practices, and mycotoxins. The webinar will be a two-part series focusing on the *Fusarium graminearum* disease cycle (Part 1) and management practices for FHB and deoxynivalenol (Part 2). Each part will feature a discussion panel of experts representing the different geographical regions and grain classes of wheat and

barley grown in the U.S. Registered attendees will receive continuing education units (CCAs) upon completion of the webinar. The Scabinar will be held March 15, 2022 from 10-12 PM CT. Visit the [USWBSI Scabinar](#) webpage for most up-to-date information. ●

*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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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 150 research projects in more than 30 states.

### USWBSI Steering Committee

- Tom Baldwin, North Dakota State University
- Kaitlyn Bissonnette, University of Missouri
- Carl Bradley, University of Kentucky\*
- Doug Buhler, Michigan State University—NCRA Austin Case, ABInBev
- Alyssa Collins, Pennsylvania State University
- Frankie Crutcher, Montana State University
- Ruth Dill-Macky, University of Minnesota‡\*
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- Tim Widmer, USDA-ARS\*
- Xiang Yin, Rahr Corporation
- Shaobin Zhong, North Dakota State University\*
- Marv Zutz, Minnesota Barley Council

\*USWBSI Executive Committee Members

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provided the audience with insight into the challenges stakeholders witness and practices processors take to reduce the impacts of the fungus on the final product. From harvest and throughout storage, the dominant microflora present on the barley shifts from field fungi to storage fungi due to changes in environmental conditions (i.e., temperature, kernel moisture, and storage time). The most prevalent are bacteria, followed by yeasts, and then molds. Additionally, the malting process may alter the types and amounts of microflora present due to the changes in temperature and moisture content through the different malting steps, which thus could influence the final flavor or quality of the finished malt.

While options exist for aiding in reducing the effects of *Fusarium graminearum* and other microflora on the malting process, many of these also come with their own set of adverse effects. One option with potential is long-term storage at warm temperatures (86°F). Long-term storage has been shown to reduce the DON concentration without affecting seed germination. However, “you need to have the luxury of storing barley for a long time, treating barley warmly, and this is not always easy in the barley producing climate,” says Yin. The industry is in search of more user-friendly options. Currently,



the only true way for the industry to control the effects of *F. graminearum* on the malting and brewing process is to select clean grain.

Following the Plenary Session, Monday and Tuesday General Sessions featured [twelve valuable invited presentations](#) covering topics ranging from determining what causes increased levels of DON in malting grains, using gene editing technologies for engineering resistance, decontaminating grains using natural based approaches, high-throughput phenotyping, application timing and its effects on fungicide efficacy, and breeding for FHB resistance in wheat. General Sessions were moderated by the FOC members and the audience actively participated with numerous questions responded to by the presenters throughout all the sessions. The

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## General Session Invited Speakers



Christina Cowger



Allan Fritz



William Hay



Cory Hirsch



Katherine Jordan



Pierce Paul



Jiajia Rao



Jessica Rutkoski



Sunish Sehgal



Shyam Solanki



Briana Whitaker



Bing Yang



list of all the presenters and their presentation abstracts are available online.

Included in this year's presentations were three PI's funded under the new USWBSI Transformational Science research category; they included **Briana Whitaker** (*Impact of Microbial Associations*

*on Fusarium graminearum Virulence and Disease*), **Katherine Jordan** (*Applications of the PHG Database in Wheat Breeding*) and **Cory Hirsch** (*Utilizing a High-throughput Field-based Rover for High Fidelity and High Temporal Resolution of FHB Phenotyping*).

In an effort to simulate in-person Poster Sessions, the 2021 NFHB Forum featured five live Poster Sessions. Over the course of the two-day period, using a self-select virtual breakout room feature, presenters were able to interact with attendees while displaying their poster on screen as attendees were able to move from author to author as they chose. In addition to the live Poster Sessions, a Virtual Poster Room provided attendees the chance to view the posters and the poster author's pre-recorded videos at their own pace. Nearly 60 abstracts were featured in this year's Virtual Poster Room/Sessions.

To increase focused networking opportunities, Monday evening featured a new event for graduate students and post-doctoral researchers. The Early Career Meetup event provided the opportunity for graduate students and post-doctoral researchers to network and ask questions of early career professionals. The Meetup had over 20 attendees and was well



Carl Schwinke



Carl Bradley



Richard Magnusson

received. More opportunities for these types of events are in the works.

During the final General Session, **Carl Schwinke**, vice president of grain supply for Siemer Milling Co. and Forum Organizing Committee Co-Chair, gained attendees' attention with a virtual tour of Rahr Malting Operations and Luce Line Brewing Company. During the virtual tour of Rahr Malting, viewers were able to tour the family-owned malt facility and experience the malting process from grain in-take through quality control. The Luce Line Brewery tour provided attendees the opportunity to experience the 2,000-barrel production and tap room in Plymouth, MN. The brewery utilizes a quality tracking program, which allows them to make a consistent product from batch to batch ensuring customer satisfaction. A special thank you to **Xiang Yin**, Rahr Corporation, and **Tim Naumann**, Luce Line Brewing Co., for organizing these virtual tours.

**Carl Bradley**, University of Kentucky plant pathologist and Forum Organizing Committee Co-Chair, kicked off a new FHB Trivia networking activity. Attendees were randomly assigned to breakout rooms. The Teams were given five minutes to identify

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## Thank you USWBSI 2021 Forum Organizing Committee (FOC)

### CO-CHAIRS

Carl Bradley, University of Kentucky  
Carl Schwinke, Siemer Milling Co.

### MEMBERS

#### FHB MANAGEMENT

Christina Cowger, USDA-ARS  
Ce Yang, University of Minnesota

#### FOOD SAFETY & TOXICOLOGY

Dave Kendra, BASF  
Jiajia Rao, North Dakota State University

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Rong Di, Rutgers University  
Guihua Bai, USDA-ARS

#### PATHOGEN BIOLOGY AND GENETICS

Zhao Jin, North Dakota State University  
Pete Oppenheimer, North Carolina State University

#### VARIETY DEVELOPMENT AND HOST RESISTANCE

Jessica Rupp (HWW-CP), Kansas State University  
Nicholas Santantonio (SWW-CP), Virginia Tech



Before a Poster Session, attendees determined which poster author to meet with, from there they could self-select and move to other authors throughout the session.



Attendees met with poster authors in breakout rooms to interact and discuss research results.

a “Team Leader” and pick a team name. A series of questions were asked, and teams had one minute to choose an answer per question. After the clock ran out following the final question, the team leaders entered their score into the online FHB Trivia Tally form. Congratulations were shared with the winning team **3B: Bread, Butter, and Beer**, which was comprised of Guixia Hao, USDA-ARS Peoria, IL; Deanna Funnell-Harris, USDA-ARS, Lincoln, NE; Joe Cinderella, University of Delaware; and Shahryar Kianian, USDA-ARS, St. Paul, MN.

Wrapping up with the Closing Session, **Richard Magnusson**, Roseau, MN grower and USWBSI Stakeholder Co-Chair, presented the final closing remarks of the 2021 National FHB Forum and announced this year’s Poster Winners. Magnusson offered special recognition to BASF for their generous cash prizes for both the graduate student and post-doctoral researcher categories of the Poster Competition. In closing, Magnusson thanked the USWBSI community for attending, everyone on the Forum Organizing Committee for putting together the schedule of events and thinking of innovative ways for a successful virtual Forum, the presenters and poster authors, as well as the NFO. He also recognized the more than 200 individuals who are involved with the USWBSI year-round in various

volunteer roles. He concluded by reminding attendees to mark their calendars for the 2022 National Fusarium Head Blight Forum to be held in person in Tampa, Florida, December 3-5, 2022.

As a reminder, abstracts of all the presentations and posters continue to be

available in the online [2021 NFHB Forum Abstract Viewer](#). If you need to reference material presented during the Forum, the full [2021 NFHB Forum Proceedings](#) are also now published. ●



Closing out the final General Session was a virtual tour of the Rahr Malting operations, where attendees experienced the full malting process from grain in-take through quality control.

## 📅 MARK YOUR CALENDARS

# 2022 National Fusarium Head Blight Forum—Back in Person in Tampa, Florida

The 2022 National Fusarium Head Blight Forum will be held December 4-6, 2022, in Tampa, Florida at the Grand Hyatt Tampa Bay. Being the only meeting on the property during this time, the hotel’s recently updated spaces provide the perfect opportunity for outdoor receptions and meals with temperatures in the 70’s°F. Newly upgraded guest rooms and meeting spaces provide comfortability and easy access. The Tampa International Airport is just minutes from the property with affordable flight options. Surrounded by a wildlife sanctuary, on property walking paths provide a 30-minute walk option during your stay. [Check out this quick property highlight video to view the space.](#) We are excited to see you all in person at the 2022 NFHB Forum! Mark your calendars, check the USWBSI [ScabUSA](#) website, and watch your email for more information as it becomes available. ●





# NFHB Forum Poster Competition Returned

The Poster Competition returned for the second year at the 2021 NFHB Forum. Featuring a total of 30 poster authors, 22 graduate students and 8 post-doctoral researchers competed for the top three spots in each category. 21 judges evaluated the posters during two rounds.

During the first round all competitors were required to submit their poster along with a pre-recorded video explaining the objectives, methods, results/conclusions of their research to be evaluated pre-Forum by the judges. Over a week-long period, poster judges evaluated the posters and videos for research concept, experimental quality, design, and overall quality and presentation.

New this year, the live Poster Sessions utilized the Zoom breakout room feature. Poster presenters each had their own breakout room within their Research Category Poster Session where attendees could stop by and listen to live presentations and Q&A. Five judges for each competition category evaluated presenters on their confidence and professionalism, ability to convey the research problem, methods, conclusions, implications using a Zoom environment, and ability to answer questions effectively.

The results were entered live, and the winners were announced at the Closing Session on Tuesday, December 7, 2021. Cash prizes, sponsored by BASF, were awarded to the top 3 finalists in each category: 1st Place - \$500, 2nd Place - \$300, and 3rd Place - \$200. A huge thank you to this year's poster competition sponsor, BASF, for generously providing these cash prizes for all the awardees.

The winners were all appreciative of their awards and were grateful for the opportunity to present their research. From feedback received, the graduate students and post-doctoral researchers who participated had an excellent experience that very closely mimicked an in-person Poster Competition. The USWBSI looks forward to organizing the competition again in 2022, details will be available in coming months.

## Special Thanks to All the 2021 Poster Judges

Jim Anderson, University of Minnesota  
Ruth Dill-Macky, University of Minnesota  
Katherine Frels, University of Nebraska-Lincoln  
Gina Brown-Guidera, USDA-ARS  
Alyssa Collins, Pennsylvania State University  
Yanhong Dong, University of Minnesota  
Jason Fiedler, USDA-ARS  
Guixia Hao, USDA-ARS  
Patrick Hayes, Oregon State University  
Matthew Helm, USDA-ARS  
David Kendra, BASF  
Susan McCormick, USDA-ARS  
John McLaughlin, Rutgers University  
Mohsen Mohammadi, Purdue University  
Jiajia Rao, North Dakota State University  
Jessica Rutkoski, University of Illinois  
David Schmale, Virginia Tech  
Damon Smith, University of Wisconsin-Madison  
Brian Steffenson, University of Minnesota  
Darcy Telenko, Purdue University  
Lisa Valliancourt, University of Kentucky

If you are interested in serving as a poster judge for future competitions, please contact [Amber Hoffstetter](#). ●

## Congratulations to the 2021 NFHB Forum Poster Competition Winners

### POST-DOCTORAL RESEARCHER AWARDEES



**1ST PLACE: Wanderson Bucker Moraes**, The Ohio State University, FHB Management Poster # 104, "Temperature, Moisture, Grain Development, and Harvesting Strategy Effects on Zearalenone Contamination of Grain Harvested from Fusarium Head Blight-affected Wheat Spikes"



**2ND PLACE: Yadong Huang**, University of Minnesota, Gene Discovery and Engineering Resistance Poster # 117, "Fine Mapping of FHB and DON Quantitative Trait Loci on Chromosome 2H in Barley"



**3RD PLACE: Gerit Bethke**, University of Minnesota, Gene Discovery and Engineering Resistance Poster # 113, "The Barley UDP-Glycosyltransferase UGT13248 is Required for Deoxynivalenol Conjugation and Type 2 Resistance to Fusarium Head Blight"

### GRADUATE STUDENTS AWARDEES



**1ST PLACE: Rebecca Shay**, Michigan State University, Pathogen Biology and Genetics Poster # 136, "Exploring the Genetics of Biofilm Development in Fusarium graminearum"



**2ND PLACE: John Hawkins**, University of Minnesota, Variety Development and Host Resistance Poster # 141, "Exploring Variation for FHB Resistance and Toxin Development in Naked Barley"



**3RD PLACE: Lovepreet Singh**, University of Maryland, Gene Discovery and Engineering Resistance Poster # 127, "Towards Fine Mapping of a Native FHB Resistance QTL from Soft Red Winter Wheat Cultivar 'Jamestown'"

To learn more about this year's poster winners check out the [January Featured Researcher posting](#).

# NorGrains Group Holds Annual Planning Meeting

The USWBSI Variety Development and Host Resistance Northern Winter Wheat (VDHR-NWW) consortium 'NorGrains' held a planning meeting in Indianapolis, IN with the ability to virtually attend on December 9-10, 2021. Twenty attendees were present either in-person or virtually including: 7 PIs, 11 graduate students, one technician, and Dr. **Brian Ward** (NorGrains Project Coordinator). On the first day of the event, all six breeders funded under the VDHR-NWW gave attendees an overview of their breeding programs. Additionally, four of the states (IL, IN, KY, and OH) have received NIFA funding for genotyping and participated in a germplasm exchange over the past two years. Brian Ward presented some simulated results designed to test the accuracy of the generated genomic estimated breeding values as the number of lines tested per environment becomes increasingly sparse. The simulated results showed that relatively accurate predictions can be made while decreasing the number of lines tested per environment. The group hopes to eventually be able to simulate across-environment testing within the region to optimize genetic gain vs cost tradeoff for highly important traits (i.e. grain yield and FHB resistance).

During the second day of the meeting, Ward presented on genotyping



technologies specifically, the NorGrains current approach of using genotyping-by-sequencing followed by a more labor-intensive genotyping of well-known individual markers for major effect genes versus an alternative approach proposed by Ward. This approach would allow the group to perform high-throughput genotyping while at the same time multi-plex genotype for characterized FHB resistance QTL, such as *Fhb1* and *Fhb7* and other "native" scab resistance. Ward has been working with the USDA-ARS Eastern Regional Small Grains Genotyping Lab to develop this pooled, multiplex targeted assay. Following Ward's presentation, the breeders presented their

efforts of adopting genomic selection into their own programs.

The breeders discussed the current germplasm exchange. A consensus was reached to include Michigan State University and Cornell University into the larger germplasm exchange. All the breeders in attendance agreed to be a part of a new cooperative test, preliminarily named the "Big 6". This test would replace the current 5 State Preliminary and Advanced Trials, in which six states currently participate. More details on establishing the Big 6 trial will be determined by the group prior to the 2022-2023 planting season. ●

## ScabNet a New USWBSI Network for Graduate Students and Post-docs

During the 2021 National Fusarium Head Blight Forum, graduate student and post-doctoral researchers gathered to meet in the evening of December 6, 2021 with Early Career Professionals from the different Research Categories within the USWBSI. Attendees were invited to ask these professionals advice on applying for jobs, choosing a career path, etc.

Feedback from this Meetup indicated that the attendees would like to gather on a more frequent basis. Graduate students **Peter Oppenheimer** (North Carolina State University) and **Lovepreet Singh** (University of Maryland) volunteered to be co-organizers of the Meetups. Recently an organizing meeting was held to determine the structure of future events.

A virtual Meetup is tentatively in the works for late March with hopes that quarterly get-togethers will be planned in the future. In addition to planning quarterly gatherings with professionals, the co-organizers hope to be able to offer monthly sessions featuring research presentations from USWBSI graduate students and post-docs and professional development specialists.

Planning of ScabNet events is in progress. To learn more, join the USWBSI [ScabNet workspace](#) to communicate with fellow peers and learn about upcoming events, follow @USWBSI on Twitter, and watch the [ScabUSA](#) What's Hot postings. ●

**Do you have any genes you would like to be expressed or modified in wheat or barley?**

The USWBSI transformation facilities are here to serve the FHB community and ready to help. For wheat transformation please contact Harold Trick ([hnt@ksu.edu](mailto:hnt@ksu.edu)) and for barley transformation please contact Rong Di ([rongdi@sebs.rutgers.edu](mailto:rongdi@sebs.rutgers.edu)) to discuss your project.



# Re-Envisioned 2021 FHB Disease Impact Update Published

The U.S. Wheat and Barley Scab Initiative (USWBSI) announced the publishing of its *2021 Fusarium Head Blight Disease Impact Update* November 3, 2021. Dr. **Amber Hoffstetter**, USWBSI research technical specialist, authored this year's article after Don Lilliboe announced his retirement. Commentary from experts in 32 states indicated few growers had issues with Fusarium head blight (FHB, scab) but rather dealt with extreme drought conditions which reduced yields and test weights. A few isolated occurrences of FHB were reported in Kansas, Missouri, Oklahoma, and Texas.

"The USWBSI Fusarium Head Blight Disease Impact Update is a valuable annual overview of the impact of FHB on small grains crops and also serves to monitor the production conditions that U.S. wheat and barley growers experienced throughout the year," noted Dr. **Ruth Dill-Macky**, USWBSI researcher co-chair. "Growers and researchers alike rely on this information to plan research in the years to come, identify production issues that might need attention, and to help validate tools used to mitigate FHB including the Fusarium Risk Tool, fungicides, and crop varieties with improved levels of resistance."

This year Hoffstetter and USWBSI Networking and Facilitation Office team re-envisioned the Fusarium Head Blight Disease Impact Update to include not only an update on the state of FHB in the U.S. during the season but also, the crop growing conditions in the different wheat and barley production regions. Additionally, photographs of these cereal crops were included to highlight specific crop conditions across the regions.

For more information on resources and publications about Fusarium Head Blight of wheat and barley visit [ScabUSA](https://scabusa.org). Producers can also view the [FHB Risk Tool](#) developed by USWBSI researchers to monitor the FHB risk in their area during the growing season as well as review prior years data for planning. Additionally, subscribe to [FHB Alerts](#) for the most up-to-date information on issues regarding FHB by state experts. ●

## Impressive Lineup of USWBSI Featured Researchers

Beginning in June 2021, the USWBSI has been featuring monthly researcher profiles of individuals within the Initiative. Check out the USWBSI's monthly Featured Researcher, email notices are sent out as they are published. New postings can also be found on the What's Hot feed of [ScabUSA](https://scabusa.org). All of the previous featured researchers are available on the [USWBSI Featured Researcher archives page](#).

January's posting features our 2021 NFHB Forum Poster Winners, make sure to check out these awesome graduate students and post-doctoral researchers. Look for next month's featured researcher posting on Dr. **José Costa**. Have an idea for a featured researcher? Send your suggestions to [amber.hoffstetter@scabusa.org](mailto:amber.hoffstetter@scabusa.org). ●

### 2021 Featured Researchers

JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Dr. <b>Katherine Jordan</b> , USDA-ARS, Manhattan, KS	Dr. <b>Cory Hirsch</b> , University of Minnesota, St. Paul, MN	Dr. <b>Katherine Frels</b> , University of Nebraska-Lincoln, Lincoln, NE	Dr. <b>Paul Schwarz</b> , North Dakota State University (retired)	Dr. <b>Stephen Wegulo</b> , University of Nebraska-Lincoln, Lincoln, NE	Dr. <b>Paul Nicholson</b> , John Innes Center, Norwich, UK	Dr. <b>Santiago Mideros</b> , University of Illinois, Urbana, IL
		Dr. <b>Nicholas Santantonio</b> , Virginia Tech, Blacksburg, VA				

# 2021 USWBSI Publications

Take some time to review this impressive listing of publications associated with USWBSI funding this past year.

- Al-Zubade A, Phillips T, Williams MA, Jacobsen K, Van Sanford D. Impact of Nitrogen Rate in Conventional and Organic Production Systems on Yield and Bread Baking Quality of Soft Red Winter Wheat. *Agronomy*. 2021; 11(9):1683.
- Anderson, J.A., Wiersma, J.J., Reynolds, S.K., Conley, E.J., Caspers, R., Linkert, G.L., Kolmer, J.A., Jin, Y., Rouse, M.N., Dill-Macky, R., Smith, M.J., Dykes, L., and Ohm, J.-B. Registration of 'Lang-MN' hard red spring wheat. *J. Plant Regist.* 2021; 15:479-489
- Brooks, W., Griffey, C.A., Vaughn, M., Seago, J., Thomason, W., Fitzgerald, J., Christopher, A., Pitman, R., Dunaway, D., Light, J., Rucker, E., Behl, H., Beahm, B., Browning, P., McMaster, N., Schmale, D., Hardiman, T., Custis, J.T., Gulick, S., Ashburn, S.B., Jones, N., Marshal, D., Fountain, M., and Oakes, J. Registration of 'SB255' winter barley. *J. Plant Regist.* 2021; 15:236-243.
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- Chhabra B, Tiwari V, Gill BS, Dong Y, Rawat N. Discovery of a susceptibility factor for Fusarium head blight on chromosome 7A of wheat. *Theor Appl Genet.* 2021 Jul;134(7):2273-2289.
- Duffeck MR, Bandara AY, Weerasooriya DK, Collins A, Jensen PJ, Kuldau GA, Del Ponte E, Esker P. Fusarium head blight of small grains in Pennsylvania: unravelling species diversity, toxin types, growth and triazole sensitivity. *Phytopathology*. 2021 Sep 7.
- Fulcher, M.R., Winans, J.B., and Bergstrom, G.C. *Fusarium graminearum* isolates obtained from wheat and wild grasses in northeastern New York display comparable range of phenotypes, including virulence on crop hosts. *J. Plant Pathol.* 103:71-77 (2021).
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- Gaire, R. Brown-Guedira, G., Dong, Y., Ohm, H., and Mohammadi, Mohsen. Genome-wide Association Studies for Fusarium Head Blight and Its Trade-Off with Grain Yield in Soft Red Winter Wheat. *Plant Disease*. 2021. 105(9):2435-2444.
- Gaire, R., Sneller, C., Brown-Guedira, G., Van Sanford, D.A., Mohammadi, M., Kolb, F.L., Olson, E., Sorrells, M. and Rutkoski, J. Genetic trends in Fusarium head blight resistance due to 20 years of winter wheat breeding and cooperative testing in the Northern US. *Plant Disease*. 2021.
- Glover, K. D., Kleinjan, J. L., Graham, C., Ali, S., Byamukama, E., Jin, Y., Ingemansen, J. A., Turnipseed, E. B., and Dykes, L. Registration of 'Driver' hard spring wheat. *J. Plant Regist.* 2021; 15:527-534.
- Huang Y, Yin L, Sallam AH, Heinen S, Li L, Beaubien K, Dill-Macky R, Dong Y, Steffenson BJ, Smith KP, Muehlbauer GJ. Genetic dissection of a pericentromeric region of barley chromosome 6H associated with Fusarium head blight resistance, grain protein content and agronomic traits. *Theor Appl Genet.* 2021 Dec;134(12):3963-3981.
- Ibrahim, A. M., Sutton, R., Johnson, J. W., Mergoum, M., Simoneaux, B., Harrison, S. A., Murphy, J. Paul, Mason, Esten R., Babar, Md A., Neely, C., Opeña, G., Jin, Y., Kolmer, J., Boyles, R., Cambron, S., Baik, B., Grown-Guedira, G., Marshall, D., and Fountain, M. O. Registration of 'GA06343.13E2 (TX-EL2)' soft red winter wheat. *J. Plant Regist.* 2021; 15: 107-112.
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# Pivotal Year for AMBA, Continuing Strong Support and Partnership with USWBSI

The American Malting Barley Association (AMBA) has been a partner with the USDA-ARS U.S. Wheat and Barley Scab Initiative (USWBSI) since its inception over twenty years ago. AMBA led efforts for the barley grower, researcher, and value-added end-user community, through the National Barley Improvement Committee (NBIC). In partnership with the National Wheat Improvement Committee and National Association of Wheat Growers, the first appropriation of \$500,000 annually was secured in FY1988, with subsequent efforts with Congress leading to its current funding level of \$15 million annually for extramural and intramural scab research.

This is a pivotal year for AMBA, as we say farewell to long-time AMBA President, Dr. **Mike Davis**, who also served as executive secretary of the NBIC and was an inaugural member of the USWBSI Executive Committee (EC). Mike served on the EC for over two decades, and many of you know and have worked with Mike and have seen firsthand his passion for small grains research. Mike came to the American Malting Barley Association as Vice President and Technical Director of AMBA in 1983, becoming President in 1991. He received his Ph.D. at University of Nebraska in agronomy and biochemistry, followed by postdoctoral work in the Agronomy Department and then the Soils Department at the University of Wisconsin. Mike retired from AMBA at the end of 2021 but will continue with his long-time passion for farming at his farms in Windsor, Connecticut and Washington Island, Wisconsin, growing Christmas trees, vegetables, and grains, including barley of course.

Assuming the role of president is former long-time AMBA vice president and technical director, **Scott Heisel**. Scott came to AMBA in 1987 after receiving an M.S. degree in agronomy from the University of Wisconsin, funded by the association. Prior to that, he studied barley enzymes at the USDA-ARS Barley and Malt Laboratory (now the Cereal Crops Research Unit) and earned B.S. degrees in biochemistry and agronomy from UW. Researchers at that lab conducted early work in the 1960s with mycotoxins on scab infested barley, which was partially funded by AMBA's predecessor organization.



Dr. Mike Davis (above), Scott Heisel, Ashley McFarland (right).

Scott has long been involved in the USWBSI, helping retain language in the Farm Bill authorizing funding for the initiative and currently serves on the Executive Committee. As staff lead for AMBA's Agricultural Policy Committee, he works closely with growers and agencies that oversee farm policy and has helped bring insurance coverage for DON in line with industry tolerances.

New to the AMBA team is **Ashley McFarland**, who assumed the role of vice president and technical director behind Scott on October 1, 2021. Previous to AMBA, McFarland held various roles in University extension programs across four states and has worked in nonprofit executive leadership. She has a B.A. in political science and environmental studies from Central College (Pella, IA) and an M.S. in environmental science from Iowa State University. As technical director, she supports communications and membership efforts, along with management of the Quality Evaluation Program, which seeks to bring improved malting barley varieties into the supply chain. She also serves as the executive secretary for the NBIC and will continue to work with barley growers, researchers, and industry representatives to secure sustained funding for barley research and policies that support domestic malting barley production.

McFarland was first exposed to the USWBSI while director of the Michigan

State University Upper Peninsula Research and Extension Center where she managed a diverse research portfolio spanning across multiple agricultural sectors. While at that post, she developed a research program around small grains primarily focused on serving the burgeoning craft beverage industry in the state. That work led to a statewide applied research program and diverse outreach and education efforts targeting farmers, grain processors, and end users. Along with the establishment of the annual Great Lakes Hop and Barley Conference, McFarland became very active in national efforts to strengthen the malting barley crop, including active participation on the NBIC, and serving on the board of directors for the Craft Maltsters Guild. Tackling FHB was a top priority in the management of malting barley in the very humid climate of Michigan, where barley was often surrounded by corn.

The AMBA team looks forward to continuing our strong support and partnership with the USWBSI. "This Initiative has played a critical role in helping ensure small grains are profitable for the growers and processors while maintaining a safe, healthy food supply," according to Heisel. "The most rewarding part of working for AMBA has been interacting with barley industry personnel, growers and researchers, and being involved in the USWBSI has broadened that to include all those in the wheat supply chain as well." ●



## Congratulations to the Following USWBSI Funded Graduates

### DECEMBER 2020



**Ben Eggers, M.S.**, The Ohio State University, Advisor: Dr. Eric Stockinger. Ben is currently employed as a research technician in the Stockinger Lab.

### 2021



**Wanderson Bucker Moraes, Ph.D.**, The Ohio State University, Co-Advisors: Drs. Pierce Paul and Larry Madden. Wanderson is remaining in the Paul Lab as a post-doctoral scholar working on epidemiology, risk assessment, and management of FHB/mycotoxins.

**Dylan Barry, M.S.**, North Dakota State University, Advisor: Dr. G. Francois Marais. Dylan is a soybean breeder with GDM Seeds, Inc., in Hutchinson, MN.



**Venkata Rao Ganaparthi, M.S.**, North Dakota State University, Advisor: Dr. G. Francois Marais. Venkata is currently working on his Ph.D. at Clemson University in South Carolina.

**Jyotirmoy Halder, Ph.D.**, South Dakota State University, Advisor: Dr. Sunish Sehgal. Jyotirmoy is remaining in the Sehgal lab as a post-doctoral researcher.

**Daniel Sweeney, Ph.D.**, Cornell University, Advisor: Dr. Mark Sorrells. Dan is now employed at Weaver Popcorn Hybrids, Indianapolis, IN.



**Virginia Verges, Ph.D.**, University of Kentucky, Advisor: Dr. David Van Sanford. Virginia is currently a post-doctoral researcher working on corn lodging resistance at the University of Kentucky.

## Best Wishes to the Following USWBSI Retirees in 2021



**P. Stephen Baenziger**, Professor, The Wheat Growers Presidential Chair and a Daugherty Water for Food Global Institute Faculty Fellow, University of Nebraska-Lincoln. Contributions:

Released 44 winter wheat, 7 winter barley, and 13 winter triticales varieties during his 35 years with the University.



**Carl Griffey, W.G. Wysox** Professor and Small Grains Breeder, Virginia Tech. Contribution:

Released 107 wheat and barley varieties during his 31 years of service to the University.



**Patrick Gross**, Research Specialist, North Dakota State University, PI: Thomas Baldwin (current) and Drs. Stephen Neate (past) and Bob Brueggeman (past). Contribution:

Managing the North American Barley Scab Evaluation Nursery (NABSEN) for 20 years.

**H. Corby Kistler**, Research Geneticist and Adjunct Professor, USDA-ARS Cereal Disease Lab and University of Minnesota. Contribution: Discovering the genetics and the biology behind *Fusarium graminearum*'s ability to infect and produce mycotoxins in small grains.



**Mitch Montgomery**, Research Technician, University of Nebraska, PI: Katherine Frels (current) and Dr. P. Stephen Baenziger (past). Contribution:

Research technician for the small grains breeding and genetics program for 23 years.



**Paul Schwarz**, Professor and Malting Barley Quality Project Leader, North Dakota State University. Contribution: Establishing and leading the USWBSI NDSU barley DON lab for more than 20 years. ●



## USWBSI EVENTS

### 2022

#### March-April

ScabNet Industry Career Panel Webinar

#### March 15

USWBSI Scabinar, CCA Credits Available

#### December 4-6

2022 National Fusarium Head Blight Forum, Tampa, FL

### 2023

#### December 3-5

2023 National Fusarium Head Blight Forum, Cincinnati, OH

## RELATED EVENTS

### FEBRUARY 2022

1-Mar 14 University of Illinois Crop Management Conference Online

2 University of Illinois Crop Management Conference, Macomb, IL

2 2022 Best of the Best in Wheat and Soybean Research, Moorhead, MN

3 2022 Best of the Best in Wheat and Soybean Research, Grand Forks, ND

8 University of Illinois Crop Management Conference, Champaign, IL

15 University of Illinois Crop Management Conference, Sycamore, IL

19-21 Hands-On Training in HTP Workshop, Kaysville, UT

22-25 North American Plant Phenotyping Network Annual Conference, Athens, GA

### JUNE

19-24 Fusarium Laboratory Workshop, Manhattan, KS

21-23 2022 APS North Central Division Meeting, Lincoln, NE

### JULY

3-7 13th International Barley Genetics Symposium, Riga, Latvia

### AUGUST

6-10 APS Plant Health 2022, Pittsburg, PA

### NOVEMBER

6-9 2022 ASA, CSSA, SSSA International Annual Meeting, Baltimore, MD

