

Activity Report

Integrated FHB Control Workshop Chemical, Biological and Cultural Control Committee US Wheat and Barley Scab Initiative

August 10-11, 2006 – Bloomington, MN

A workshop was held in Bloomington, MN and attended by 18 scientists. The first afternoon and evening were spent discussing what we know about scab and how we communicate it. Several concerns were voiced as issues:

- We are not communicating FHB management methodologies effectively enough with ag input dealers that have great influence on producer's decisions. While independent crop consultants and growers are targeted in standard Extension program delivery, elevator agronomists and dealers are often not a part of the audience.
- Significant concern was voiced that we do not decouple DON from FHB and crop production – we still need yield from the crop, affected by FHB while DON is a product of the pathogen. Disease is an indicator of the pathogen as is the presence of DON. In the vast majority of cases, DON is associated with disease development. *Fusarium graminearum* is a facultative organism and it survives in residue for about 90% of the year. Residue management is critical to managing FHB and DON.
- The successes of current research are being overlooked. Data from NDSU indicate that individual management decisions can have a significant influence on FHB and DON. Planting on soybean residue rather than wheat reduced FHB and DON by 50%. Planting a moderately resistant cultivar rather than a susceptible reduced FHB and DON by 60% and using a Folicur treatment at flowering reduced FHB by 60% and DON by 40%.
- Forecasting systems are not definitive in predicting disease, but provide another assessment of risk at a given location at a given point in time and serve as a decision aid for fungicide use.

A compilation of **Good Farming Practices Recommendations for Optimizing FHB Management** was developed and has been posted to the USWBSI WebBoard for discussion within the FHB community, as follows:

1. Management of FHB and the associated product DON can not be attained by any single control measure. An integrated approach is critical to achieving the best possible control in any given environment. Even the best control of FHB may not result in complete elimination of the disease, but by suppressing FHB to the greatest extent possible, by implementing all of the best known practices, the potential is there for the best possible suppression of DON. The following factors are known to influence FHB and DON development.
2. Crop Sequence
 - 2.1. Cereal residue is the source of inoculum for FHB. Follow practices to facilitate residue decomposition. In an environment where cereal residue persists, or if you are aware of highly infested residue from recent year's crops, such as from a history of FHB in a specific field, an increased risk of FHB exists. Separation of wheat crops from recent cereal crops (longer rotations) will reduce risk from residue-borne *Fusarium*.
 - 2.2. **Caveat:** See local recommendations for cropping sequences. In areas where planting wheat into corn residue is a common practice, seek corn hybrids that may reduce risk.

3. Variety selection
 - 3.1. Plant the most FHB resistant varieties adapted to your region. Look for the **“best available resistant cultivar”** for the class of grain you are planting.
4. Fungicide
 - 4.1. Treat with a properly timed, efficacious fungicide when [FHB forecasting \(http://www.wheatscab.psu.edu\)](http://www.wheatscab.psu.edu) indicates your wheat crop flowering or your barley crop heading during a period of high FHB risk and yield potential warrants the treatment.
 - 4.2. Consider weather forecasts and their favorability for FHB development for the period following flowering.
 - 4.3. Follow local recommendations for **ground application of fungicide for FHB** suppression including droplet size, carrier volume, and nozzle orientation.
 - 4.4. Higher carrier volumes (5 gpa and greater) offer the potential for better head coverage when aerial application is used. Proper spray patterns are critical for uniform coverage by air.
5. Use of forecasting information as an additional tool to aid in fungicide application decision making.
6. Vary flowering dates of the wheat and barley crop across the farming operation.
 - 6.1. Stagger planting dates and plant several cultivars of spring grains to spread the risk from FHB
 - 6.2. Staggered planting dates alone are not as effective with winter grains. Vary flowering dates by planting several cultivars on several planting dates.
7. Follow practices to reduce lodging by cultivar selection, and optimizing seeding rates and nitrogen fertility for local conditions.

The concept of “branding” some term to designate the best available cultivar for resistance to this disease was considered (item 3.1, above). We recommend further discussion of this concept at the Forum in Raleigh, NC.

A uniform cultural/integrated study was defined that takes into account the most readily manageable factors in a small grain production system including cultivar selection fungicide use residue source (an optional factor) and planting date (an optional factor). Details of this protocol were circulated to state of regional coordinators that were to recruit cooperators and PIs in representative areas.

Several knowledge gaps were identified for research and outreach.

1. Can the effects of integrated FHB management methods be quantified? We know what effect each factor can have, but we do not know if those effects are additive or synergistic or if there are interactions with certain cultivars (*To be addressed with the Uniform Integrated Management Trial*).
2. Is it feasible to develop a point system for risk factors? That system could be used to augment the forecasting system.
3. Do early fungicide applications (application to residue associated with foliar treatments) have an effect on inoculum production or FHB?
4. What is the FHB disease vs. DON potential in various cultivars from all grain classes?
5. Can added microbial biocontrol agents and/or fertility enhancement increase the rate of residue decomposition?

6. Can the USWBSI web site serve more of an outreach function as a portal page to University information and also as a host for some unique content (*already present in one form – perhaps this could be reviewed by a breakout group at Raleigh*)?
7. Can an ALERT system be developed, where producers and advisors are notified of high risk in their production area?
8. Can application test kits be developed that could help producers assess the uniformity of private and/or commercial applications?
9. Can variety resistance scoring methods be standardized across regions/within regions to help growers understand how a variety is rated and what that rating means relative to some other cultivar in another grain class?

Attendees:

Martin Draper, Jeff Stein, Laird Larson, Bruce Bleakley, Marcia McMullen, Joel Ransom, Stephen Neate, Dave Torgerson, Ruth Dill-Macky, Char Hollingsworth, Kevin Smith, Pierce Paul, Erick DeWolf, Mizuho Nita, Roger Kaiser, Gary Bergstrom, Laura Sweets, and Don Hershman