



# Fusarium Focus

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## 2010 National FHB Forum Set for Milwaukee Dec. 7-9



Photo Credit: Milwaukee DCD

The Hyatt Regency in Milwaukee, Wisc., provides the setting for the 2010 National Fusarium Head Blight Forum on December 7-9. This year's Forum — the 13th — is designed for wheat and barley growers, grower group representatives, public and private scientists, millers, maltsters and brewers, additional food processors, consumers and others with interest in Fusarium Head Blight (scab) and its impact.

Hosted by the U.S. Wheat & Barley Scab Initiative (USWBSI), the 2010 Forum features stakeholder and scien-

tific speaker presentations, focused group discussions, evening breakout gatherings, and poster sessions.

The Forum convenes at 1:00 p.m. on the 7th with a welcome from Dave Van Sanford, USWBSI co-chair. A keynote presentation will be delivered by Deirdre Ortiz, a principal scientist with the Kellogg Foundation of Battle Creek, Mich. *Session 1: Gene Discovery and Engineering Resistance* and *Session 2: Pathogen Biology and Genetics* come next. A poster session focusing on those two program areas

rounds out the afternoon. Later, an evening breakout gathering will provide an update on the UG 99 Nursery.

*Session 3: FHB Management* constitutes the Wednesday morning program, with focused group discussions filling the Wednesday afternoon agenda. A poster session runs from 4:15 to 6:00 p.m., with evening breakout meetings also planned.

Thursday morning begins with *Session 4: Food Safety, Toxicology and Utilization of Mycotoxin-Contaminated Grain*. That's followed by *Session 5: Variety Development and Host Plant Resistance*.

The USWBSI Steering Committee meets on Thursday afternoon following the Forum's noon adjournment.

Key dates for the 2010 National Fusarium Head Blight Forum include:

- Nov. 1 — Deadline for registration of posters, papers, abstracts.
  - Nov. 5 — Deadline for submission of abstract and manuscript content for the Forum proceedings.
  - Nov. 8 — Deadline for early registration (fee: \$150) and last day to receive a full refund.
  - Nov. 9 — Late registration begins (fee: \$185).
  - Nov. 12 — Last day to reserve hotel room with guaranteed availability and rate.
  - Nov. 22 — Last day to receive a partial refund.
  - Nov. 26 — Registration closes.
- Advance registration is required and can be accomplished online at USWBSI's website: [www.scabusa.org](http://www.scabusa.org). Participants are responsible for making their own hotel reservations. To do so, use the link on the USWBSI website. ♦



# FHB in 2010

## — An Overview —

*The incidence and severity of Fusarium Head Blight (FHB) during the 2010 U.S. small grains production season was — when summarized across the major wheat and barley growing areas — fairly low.*

*Yet 'hot spots' did develop in various states, according to a recent U.S. Wheat & Barley Scab Initiative survey of university small grains specialists.*

*Here's an overview, by region.*

### Mid-Atlantic Soft Winter Wheat Region

Greg Roth, **Pennsylvania** State University agronomist, reports that scab was a “spotty problem” in 2010, with a few hot spots — but generally much less than in 2009.

Numerous growers applied fungicides to their wheat fields (Prosaro or Caramba). Those applications “seemed to reduce late-season Stagonospora Glume blotch and suppress FHB symptoms by 30-50%,” Roth observes.

A very dry growing season in **Delaware** meant no scab in that state's wheat fields, according to Robert Mulrooney, extension plant pathologist with the University of Delaware. “Hardly any fungicide was used for anything [in 2010] since we had such poor stands from late planting last fall,” he adds.

Next door, **Maryland** wheat growers largely dodged the scab bullet this year as well. “There were low-level infections in some parts of the state, depending on maturity and environment,” reports University of Maryland field crops plant pathologist Arv Grybauskas. Grybauskas says he did hear about a few truckloads of wheat with deoxynivalenol (DON) levels of up to 2.0 parts per million (ppm), but expects they were “most likely due to a late-season infection in a susceptible variety.”

Grybauskas says seed suppliers in Maryland are actively selecting for wheat varieties with higher levels of resistance to scab, so “the supply of really susceptible varieties is being reduced.” But the low infection levels of 2010 “were primarily due to environment.”

Some Maryland producers used fungicides (mainly Prosaro) prophylactically without regard to FHB forecasts, Grybauskas notes. Others appeared to base their applications (or lack thereof) on forecast models. Most Maryland wheat

fields did not need a fungicide treatment for scab this year.

Christina Cowger, USDA-ARS plant pathologist at **North Carolina** State University, says scab was not a significant problem in that state's wheat or barley fields this year. “The state was gripped by drought in April, which is the critical time period for scab infection,” she points out. “We were surprised to see a trace of scab ‘here and there’ in the south central part of the state, demonstrating that plenty of inoculum is available, should a stray thunderstorm strike a farm or two.

“But we heard no reports of DON troubles or yield or test weight effects of scab in North Carolina” in 2010.

### Midwest / Northern Soft Winter Wheat Region

The big story in the region occurred in **Ohio**, where scab incidence levels ranged from 3% all the way up to 60%, with vomitoxin (DON) levels from less than 1 ppm up to 18 ppm. A survey of 145 wheat fields in 32 Ohio counties revealed that 16% had scab incidence below 5%; 21% of the fields had incidence levels between 5 and 10%; 33% of fields were between 10 and 25%; and 30% of the surveyed fields incurred scab incidence levels above 25%.

Ohio State University plant pathologist Pierce Paul says it's not known how many Ohio wheat growers planted scab-resistant varieties this year or how many acres were sown to such varieties. “However, we do know that the farmers we have talked to who had scab and planted one resistant variety in particular (Malabar) reported seeing the benefit of planting varieties with resistance,” Paul remarks.

Malabar is a new variety coming out of OSU's wheat breeding program (with support from the U.S. Wheat & Barley Scab Initiative). Its level of scab resistance is comparable to that of Truman, which has been the “resistant standard” for soft red winter wheat areas. Paul says that in the 2010 OSU Extension Wheat Performance Trial, 13 entries had FHB values that were equal to or less than Truman. That group included five of the top 15 yielding varieties in the trial.

While statistics are not available on the number of Ohio wheat fields that were sprayed with a fungicide this year for scab, Paul says “the farmers we have talked to who did apply a fungicide were very happy with the results.” Even in areas where scab levels were high, “some of the fields

with the lowest levels of vomitoxin, highest yields and [highest] test weights were those that received a fungicide application at flowering,” Paul notes. “In some cases, growers even reported seeing differences in fungicide efficacy when Malabar was treated [as compared to] when a susceptible variety was treated.”

Given this year's experiences, “I anticipate that more growers will be plant-

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*The big story occurred in Ohio, where scab incidence levels ranged from 3% all the way up to 60%.*

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ing resistant varieties and applying a fungicide if scab threatens in 2011 and beyond,” Paul says.

Over in **Indiana**, Purdue University extension plant pathologist Kiersten Wise says wheat fields in the state’s southern district typically had light to moderate levels of scab infection this year, though some later-flowering varieties did incur higher levels. “Wheat in central and northern Indiana had moderate to high levels of scab present, due to favorable weather conditions and high humidity at and following flowering,” Wise adds.

The amount and type of fungicide used varied by producer and district. “My guess is that more fungicides were flown on in southern Indiana [than in the north], since scab is typically more of a problem there,” Wise remarks.

Wise says she’s aware of DON levels ranging from less than 1 ppm up to 11 ppm in northern Indiana, so some growers obviously incurred substantial dockage.

West of Indiana, scab was not as severe in southern **Illinois** (that state’s major wheat district) as it was the prior year, according to Carl Bradley, University of Illinois extension plant pathologist. However, “the small acreage of wheat in central and northern Illinois did appear to be affected much more severely by scab in 2010,” he notes.

“Due to the severe scab epidemic that growers faced in Illinois in 2009, I’m positive that picking a variety with a high level of scab resistance was high on their priority list for the 2009/10 winter wheat growing season,” Bradley observes. “From our research in 2010, varieties with a high level of scab resistance did perform well.”

As elsewhere, small grains specialists in Illinois have been emphasizing to growers the importance of an integrated approach to scab management — including the use of fungicides as warranted. “In our field trials, Caramba and Prosaro appear to be the best products currently available for reducing both scab and DON,” Bradley reports. “Because of the high levels of scab in 2009, scab was certainly on growers’ minds for the 2010 season — and the percentage of acres [treated] with a fungicide was likely higher in 2010.” Folicur and other tebuconazole fungicides also were applied this past season to some acreage.

University of **Kentucky** extension plant pathologist Don Hershman says that fungicide use in his state’s wheat districts was quite widespread in 2010, “primarily due to producers still stinging from the 2009 FHB epidemic.” Hershman estimates that about 30% of the state’s wheat acreage was treated with a fungicide this year. “In key production areas in southern Kentucky, that number is probably 70%,” he adds.

Fusarium Head Blight was not nearly as severe in

Kentucky in 2010 as it was in 2009, Hershman notes, although FHB levels were significant in southern parts of the state. “Most farmers felt they got an acceptable level of control of FHB symptoms and DON” this year, he relates, with Stagonospora leaf blotch and leaf rust also managed by the fungicides.

All in all, the 2010 Kentucky wheat crop, while not a record breaker, was “far superior” to that of 2009, Hershman concludes.

Laura Sweets, extension plant pathologist with the University of **Missouri**, says estimating the amount of scab in that state was complicated by the significant reduction in wheat acreage this past season (due mainly to wet conditions last fall). “Then, because much of the wheat was planted late and conditions were still wet, stands were poor and uneven, and plants were quite small going into winter.”

Harvested wheat acreage in Missouri was down by more than half from 2009.

“Scab did occur in most areas of the state,” Sweets adds. “It was probably more severe in central and northern Missouri than in southern Missouri.”

University of Missouri wheat breeder Anne McKendry says that a wet spring contributed to significant scab in her breeding nurseries — particularly at Columbia and in the Bootheel (up to 30% in susceptible varieties).

“Resistant varieties did well; and based on seed sales of certified seed, varieties such as Truman and Bess (both from the UM program) were widely grown,” McKendry observes.

Up in the Great Lakes vicinity, University of **Wisconsin** extension plant pathologist Paul Esker reports “fairly low” levels of scab overall in 2010. “We had scattered reports, but levels were not as bad as in previous years,” he says.

While he doesn’t have firm estimates of fungicide use for scab in Wisconsin, Esker says reports he’s received indicate Prosaro was the fungicide of choice where applications did occur. “We have seen good results with Proline and now Prosaro in our trials,” he says.

Next door, **Michigan** State University Sanilac County extension director Martin Nagelkirk says there were some initial concerns regarding late-developing Fusarium Head Blight and potential hot spots for DON. While some of it did indeed materialize, it was generally less than predicted. Statewide, Nagelkirk believes perhaps 2% of the Michigan wheat crop had DON levels above “the usual limit” (1 ppm for soft wheat and 2 ppm for soft red wheat). “What was interesting,” he adds, “is that nearly all elevators across the state reported receiving numerous loads having low DON levels — interrupted by an occasional and unpredicted load having a relatively high DON level.”



One hot spot of note was in southeastern Michigan (especially Lenawee County). “This red wheat area exhibited many fields having lots of heads exhibiting FHB,” Nagelkirk relates. “However, the number of loads having high DON was surprisingly low.” The second hot spot was in Isabella County (central Michigan).

“Here, both red and white wheats tested very high for DON,” Nagelkirk reports, “with perhaps 10 to 20% subjected to discounts or rejection.” Several growers experienced losses from DON levels despite having used Caramba or Prosoaro, he adds.

Fungicide treatments consisted almost entirely of Prosoaro or Caramba. Nagelkirk estimates that about 60% of the state’s soft white winter wheat acreage and about 15% of the soft red winter wheat was treated at flowering, with the dual purpose of protecting against FHB and minimizing losses from foliar diseases.

In **New York**, “2010 was a banner year for growing and marketing soft winter wheat,” reports Cornell University plant pathologist Gary Bergstrom. “The crop was consistently ahead of typical development by two or more weeks, due to an unusually warm spring and early summer. Yield and grain quality were high.”

Winter wheat in the state flowered during a sustained dry period in late May, according to Bergstrom, “resulting in very few visible symptoms of scab and generally low levels of DON contamination in harvested grain.”

Very little spring wheat is produced in New York, and that may have been fortuitous in 2010, Bergstrom adds. Experimental fields of spring wheat, located in the vicinity of winter wheat fields that displayed no scab, showed high levels of FHB. Those spring wheat fields initiated flowering during a brief rainy period in mid-June.

“We were also reminded just how important adequate numbers of Fusarium spores are to FHB epidemics,” Bergstrom notes. “In our integrated management experiments in central New York, inoculation of wheat heads with spore suspension at flowering — and with no supplemental irrigation — resulted in about one-quarter of those heads developing FHB symptoms, as compared to no visible FHB in non-inoculated border plots.”

## Great Plains / Hard Winter Wheat

In **Nebraska**, scab developed at moderate levels in isolated fields, says University of Nebraska extension plant pathologist Stephen Wegulo. Affected fields mainly consisted of those with surface corn stubble, irrigation, highly susceptible varieties and/or those not treated with fungicides for this disease. Fields with significant levels of scab were observed in the southeastern, south central and southwestern districts of the state.

“Overall, scab damage was minimal statewide,” Wegulo reports. “There were no reports of discounts at elevators due to Fusarium-damaged kernels or DON.”

Scab was a problem in **Kansas** for a third straight year, reports Kansas State University extension plant pathologist Erick DeWolf. “The disease was most severe in northeastern Kansas, where [the] FHB index ranged from 2 to 10%,” he says. Several major wheat-producing counties were

affected by scab in 2010. “Wheat acres were down in these counties relative to recent years,” DeWolf states, “and the overall impact of scab was 0.9% of the wheat production in Kansas — or, 3.3 million bushels valued at nearly \$13 million.”

Among commercial producers in Kansas, “the epidemics of stripe rust were the major target of fungicide use this year,”

DeWolf explains. “Seed producers were more likely to target scab.” Folicur, Prosoaro and Caramba were the predominant fungicides utilized.

On a positive note, Kansas wheat acreage planted to susceptible varieties has decreased dramatically in the past two years, DeWolf says. The KSU variety Everest is the newest release with substantial resistance to scab. Other varieties with moderate or intermediate resistance to FHB include Hitch (WestBred) and Art (AgriPro). Everest just went to certified seed producers in 2010, DeWolf adds, so its impact on disease this year was minor. Combined, Art and Hitch currently represent about 4.5% of Kansas wheat acres. The highly susceptible variety Overley dropped to less than 10% of Kansas wheat acreage this year.

While scab historically has not been a concern in **Oklahoma**, it was a problem during 2008 and moreso in 2009 due to extended cool, wet weather patterns while the wheat was flowering. Weather this year reverted to a more-typical pattern, “and less scab was reported in Oklahoma in 2010 than was seen in 2008,” says Oklahoma State University extension wheat pathologist Bob Hunger.

Because scab typically is not an issue in Oklahoma, the reaction of the winter wheat varieties grown in the state is largely unknown, Hunger adds. While much of the state’s wheat crop received fungicide treatments this year, those applications targeted leaf rust, stripe rust and powdery mildew, not scab or other diseases.

## Northern Great Plains Hard Spring Wheat Hard Winter Wheat / Malting Barley

Scab was a severe problem for some parts of **South Dakota** in 2010 — particularly on popular yet more-susceptible winter wheat varieties such as Wesley and Smoky Hill. Some production areas escaped major infection, however, according to Larry Osborne, South Dakota State University plant pathologist.

“Growers are using fungicides for scab much more frequently now than just three or four years ago,” Osborne reports. “Many growers have chosen to use tebuconazole because of the low cost; however, growers in scab-prone

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*The amount of Kansas wheat acreage planted to susceptible varieties has declined dramatically in the past two years.*

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areas are using Caramba or Prosaro at flowering.”

The SDSU risk monitoring system received hundreds of visitors during the peak part of the season. “For those growers who have begun to manage scab in an integrated way (variety, forecasting, fungicide), FHB is much lower than for the unmanaged fields nearby,” Osborne reports. “We expect and think we achieve around 60-80% reduction in disease and DON versus untreated — and perhaps even 80-90% less disease and DON than under similar environments 10-15 years ago.”

New moderately resistant spring wheat varieties available to South Dakota growers include Brick (SD-08), and Select (SD-09). Several other recent releases from the region are in regular use, including Lyman, a moderately resistant HRWW from SDSU, and Art a moderately resistant HRWW line from AgriPro. Arapahoe and Darrell winter wheats also performed well against scab in 2010, Osborne reports.

“These and other improved varieties are beginning to overtake the wheat acres in areas prone to regular and severe FHB,” the SDSU pathologist observes. “I would estimate nearly all of the spring wheat [presently] planted in South Dakota has some level of improved FHB resistance, and perhaps about 40-50% is planted to those varieties with FHB1 or other strong sources of resistance. That figure is increasing each year.”

Winter wheat acreage in South Dakota remains dominated by varieties (e.g., Wesley) with poor resistance to FHB. Growers in the state’s eastern half have encountered FHB and DON more frequently, however, and thus have begun seeking more-resistant lines (e.g., Overland and Lyman) with comparable agronomic qualities to meet that need.

**North Dakota** enjoyed a relatively benign scab year in 2010, according to North Dakota State University extension plant pathologist Marcia McMullen. This year’s NDSU field survey program found pockets of scab infection (typically in more-susceptible, nonsprayed varieties), but overall scab severity across the state averaged less than 2%. “Some late-planted durum fields in the northwest corner of the state, if not sprayed with fungicide, had slightly higher levels with field severities from 3 to 5%,” McMullen reports.

How common were fungicide applications for scab in 2010? “Based on calls received, sprayer tracks observed after heading and rumors in the industry that some products were sold out, it is believed that a considerable number of wheat, barley and durum acres were treated for scab and/or leaf diseases,” McMullen remarks. Tebuconazole, Prosaro and Caramba were the products of choice, with the former being a considerably less expensive option.

Glenn, one of the most resistant varieties available, was grown on 25% of this year’s North Dakota hard red spring wheat acreage, followed by Faller on 15% of the acres. Kelby and RB07 were grown on another 11% of the acres —

for a total of 51% of the state’s spring wheat acres being planted to varieties that North Dakota State University rates as “moderately resistant” to “moderate” and the University of Minnesota rates as a 3 or 4 (“best available” resistance).

North Dakota spring wheat producers also planted another 16.5% of their acres to varieties that Minnesota or North Dakota rate as “intermediate” in scab response. So 67.5% of the 6.7 million acres of hard red spring wheat planted in the state in 2010 were to improved scab-tolerant varieties.

In the durum arena, 26.6% of North Dakota’s 1.8 million durum acres this year were planted to Divide, the durum variety with the best scab resistance available.

All barley varieties currently grown in North Dakota are considered susceptible to scab. However, scab levels were relatively low in barley this year, and as of September 1, no reports of barley DON discounts had been received by McMullen.

“Overall, it appears that even though the risk of scab was often indicated by the FHB forecasting risk map tool, growers

had grown more-resistant varieties and used fungicides, which minimized their risk,” McMullen says in summarizing the 2010 season. “Also, periods of risk were often followed by days of very high winds, which may have arrested the development of the fungus.” In some NDSU research plots, initial infections did not spread much because of “gale-force” winds following infection events.

The scab outlook in **Minnesota** looked quite threatening early in the 2010 season. “Risk models and weather forecasts were pointing to moderate to high risk for damages due to FHB during the week that much of the spring wheat crop reached Feekes 10.51 [growth stage],” notes Jochum Wiersma, small grains specialist with the University of Minnesota’s Northwest Research & Outreach Center. Ultimately, however, overall scab damage in Minnesota spring wheat was light and only slightly higher than in 2008 or 2009.

Minnesota’s winter wheat crop was not as fortunate. “Winter wheat, which relies on ‘escape’ rather than ‘resistance’ to FHB, showed significant levels of FHB — despite very early heading dates,” Wiersma states. “Field severities approaching 20% were not uncommon if no fungicides were used to suppress FHB.”

The state’s small grain producers employed fungicides more extensively this year than in 2009, Wiersma relates. The higher the scab risk as indicated by forecast models, the more likely growers were to go with Prosaro or Caramba, he adds.

Wiersma says varieties rated as moderately resistant to Fusarium Head Blight accounted for about 40% of Minnesota’s wheat acreage this year. Varieties rated as susceptible to very susceptible constituted less than 15% of acreage. — Don Lilleboe

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*With growers aided by more-resistant varieties and fungicides, scab severity in North Dakota averaged less than 2%.*

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# USWBSI Research Funding: FY '10

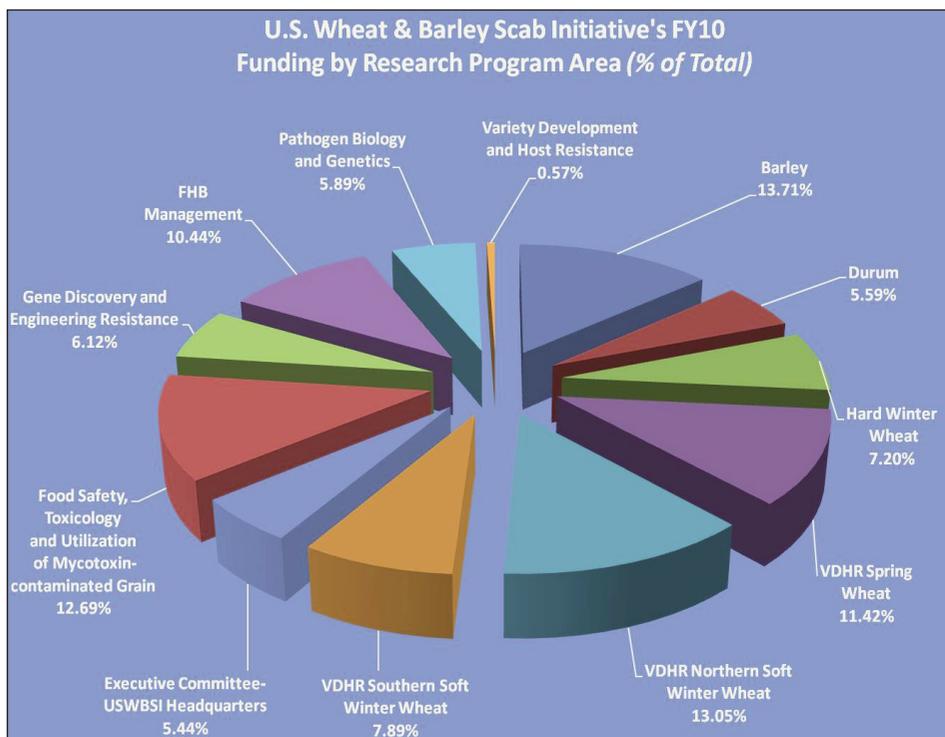
Based on the U.S. Wheat & Barley Scab Initiative's (USWBSI) recommendation, USDA's Agricultural Research Service awarded \$4,926,864 in scab-related research project funding for fiscal year 2010. That total encompasses 137 projects in 25 states. Funded entities include 24 land grant universities and USDA-ARS.

The pie chart at right depicts the percentage of total funding being invested in the various research areas. In terms of dollars actually allocated by ARS per research area, the breakdown is as follows:

- *Variety Development & Host Resistance (VDHR) / Northern Winter Wheat Region* — \$641,832 / 12 projects
- *VDHR / Spring Wheat Region* — \$561,849 / 16 projects
- *VDHR / Southern Winter Wheat Region* — \$387,784 / 6 projects
- *Hard Winter Wheat Coordinated Project* — \$356,266 / 12 projects
- *Durum Coordinated Project* — \$275,790 / 6 projects
- *Barley Coordinated Project* — \$675,731 / 18 projects
- *FHB Management* — \$514,096 / 43 projects
- *Food Safety, Toxicology & Utilization of Mycotoxin-Contaminated Grain* — \$624,304 / 5 projects
- *Gene Discovery & Engineering Resistance* — \$302,611 / 8 projects
- *Pathogen Biology & Genomics* — \$290,282 / 11 projects
- *Executive Committee & USWBSI Headquarters* — \$268,514

Each year, the USWBSI is charged with developing a comprehensive research plan and budget recommendation geared toward achieving its primary mission: to develop, as quickly as possible, effective control measures that minimize the threat of Fusarium Head Blight (scab) — including reduction of mycotoxins — to producers, processors and consumers of wheat and barley.

In 2006, USDA-ARS charged the USWBSI with the task of developing a



three- to five-year Action Plan that would include a greater focus on the reduction of deoxynivalenol (DON). Development of the Action Plan began at the 2006 National FHB Forum, and it has continued to evolve since then with the incorporation of feedback from the overall scab community.

The process followed to develop this research plan and budget is the product of extensive deliberations overseen and approved by the USWBSI Steering Committee (SC). The SC is comprised of growers, farm organizations, food

processors, public and private scientists and consumer groups.

This year's initial proposal review process was coordinated by USWBSI's Networking & Facilitation Office in close consultation with the Executive Committee (EC) and the chairs of each individual research area. The EC's recommended plan and budget were presented to the USWBSI Steering Committee in December 2009. Following a briefing and study of the plan, the SC passed it unanimously, and it then became the official USWBSI comprehensive research plan and budget recommendation for fiscal 2010. It later was translated into individual ARS grant applications, which in turn were submitted, en masse, as the USWBSI's recommendation for how ARS could allocate the resources awarded it by the U.S. Congress.

Anyone wishing to learn more about the funding application and approval process should visit the U.S. Wheat & Barley Scab Initiative's website: [www.scabusa.org](http://www.scabusa.org).

## Individual Project Details

To view complete listings of fiscal year 2010 research project titles, names of principal investigators, institutions and the amount of USWBSI funding, visit [www.scabusa.org](http://www.scabusa.org). Click on the "Research Categories" tab and then go to the desired research area.



# Gene Loss Improves FHB Resistance in Wheat

USDA-ARS and University of Minnesota researchers have identified a novel genetic basis for increased Fusarium Head Blight (FHB) resistance in spring wheat.

Initially, David Garvin of the USDA-ARS Plant Science Research Unit in St. Paul, Minn., and Ruth Dill-Macky of the Department of Plant Pathology at the University of Minnesota, had postulated that the increased FHB resistance they observed in a derivative of the FHB-susceptible dwarf spring wheat cultivar Apogee was due to the introduction of a major FHB resistance gene from the soft red winter wheat Freedom. As part of a USWBSI-funded project, they set out to identify molecular markers for this proposed gene, with the intent of providing tools and resources to regional spring wheat breeders that would permit use of this new FHB resistance gene in combination with other genes already widely in use.

Instead, what Garvin and Dill-Macky found puts a new twist on our understanding of the genetic control of FHB resistance and how we might combat this disease.

Armed with a mapping population developed by crossing Apogee with its more FHB-resistant derivative, and molecular marker data provided by ARS collaborator Shiaoman Chao in

Fargo, N.D., the research team — which included University of Minnesota postdoctoral researcher Hedera Porter and ARS lab technician Zachary Blankenheim — set out to search for associations between improved FHB resistance and molecular markers from Freedom present in the FHB resistant Apogee derivative, but not in the parent Apogee line.

As the project progressed, no clear associations were being detected, puzzling the research team.

The project took an unexpected turn when Porter began evaluating the relationship between FHB resistance in the population and molecular markers that were absent or “null” in the FHB-resistant Apogee derivative, but present in both Apogee and Freedom. This type of molecular variation suggests the presence of a completely new mutation in the Apogee derivative — specifically, a deletion of the chromosomal segment on which the markers in question normally reside.

After evaluating the relationship between the null markers and FHB resistance in the population, it became evident that a strong association exists between the null markers in the Apogee derivative line and improved FHB resistance. Indeed, in the mapping population, the vast majority of the most FHB-resistant lines had the

same null markers observed in the more resistant Apogee derivative line. On average, these lines exhibited approximately 50% less FHB damage than did Apogee, based on experiments in which FHB resistance in the mapping population was measured by tracking the amount of disease spread from a single inoculation point in wheat spikes.

The researchers speculate that the loss of the chromosome segment in the Apogee derivative may increase FHB resistance by eliminating a wheat gene that normally suppresses a full defense response against the fungus by the wheat plant. Alternatively, the deletion may remove a wheat gene that triggers the fungus to be more aggressive as it invades a wheat spike.

Additional experiments are being pursued to assess aspects of these hypotheses and to determine if the loss of the particular chromosome segment identified in this research will also increase the FHB resistance of other wheat cultivars. The authors plan to publish their findings after these experiments are completed. ♦

*This material is based upon work supported by the U.S. Department of Agriculture. This is a cooperative project with the U.S. Wheat & Barley Scab Initiative.*

## Steering Committee Meets in St. Paul

The U.S. Wheat & Barley Scab Initiative Steering Committee held its semi-annual meeting May 25 (right) on the University of Minnesota's St. Paul campus. Several key topics filled the day-long agenda, including the updating and improved integration of the breeders' database; implementation and use of the ScabSmart website; and improving communications with the Initiative's stakeholders. Leaders of the various USWBSI research areas also delivered reports outlining their respective teams' priorities and progress, as well as achievement plans going forward.

The next meeting of the USWBSI Steering Committee will be held in Milwaukee December 9 following the conclusion of the 2010 National Fusarium Head Blight Forum.



# DeMarchi Fills NAWG Research, Biotech Post

Jane DeMarchi joined the National Association of Wheat Growers (NAWG) in mid-July as director of government affairs for research and technology, a newly created position

DeMarchi is focusing on research-related policy issues, including appropriations and administrative grant-making processes; tracking and consolidating

wheat research work already being done within the industry; and coordinating industry efforts related to the commercialization of biotech wheat.

“The new research and technology position is critical to NAWG’s work in encouraging investment and innovation in our industry’s future,” said NAWG CEO Dana Peterson. “I have every confidence that Jane has the appropriate experience and passion to lead NAWG’s



Jane DeMarchi

efforts to coordinate existing and emerging wheat research ventures.”

DeMarchi worked for the North American Millers’ Association (NAMA) from 2004 until joining NAWG this summer. Most recently, she was NAMA’s director of government relations, responsible for advocating on a wide range of issues pertaining to food and grain quality, safety and research.

She came to NAWG with well-established roots in the wheat research community, having served on the U.S. Wheat & Barley Scab Initiative (USWBSI) Executive Committee and the boards of the Wheat Quality Council and the National Coalition for Food and Agricultural Research.

During her time at NAMA, DeMarchi also worked closely with the National Wheat Improvement Committee and NAWG to secure additional federal funding for wheat research. She also initiated a comprehensive research plan for oats.

DeMarchi will also spend some time working on food safety and food aid issues for NAWG. She is an active member of the Agricultural Food Aid Coalition, which supports the use of U.S. commodities in USDA and U.S. Agency for International Development (USAID) food aid programs.

“I am eager to fill this newly created role, bringing stakeholders and researchers together to solve critical issues for wheat growers and the entire wheat value chain,” DeMarchi said upon her appointment.

Prior to joining NAMA, DeMarchi worked in the fields of economic development and trade promotion for the Ohio Department of Development and the U.S. Department of Commerce in Ohio, Hong Kong and Shanghai.

Born and raised in Ohio, she received her bachelor’s degree in Asian studies from Dartmouth College in Hanover, N.H. She lives with her husband and two children in Maryland.

DeMarchi can be reached at the main NAWG number, 202-547-7800, or at [jdemarchi@wheatworld.org](mailto:jdemarchi@wheatworld.org). ♦

## Recent Scab-Related Peer-Reviewed Publications

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## Fusarium Focus

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