USWBSI Co-Chair Outlines Initiative's Recent Progress & Current Challenges

By Don Lilleboe*

For the farmer currently confronting Fusarium Head Blight (scab) in his fields, "incremental progress" in research aimed at understanding and controlling this disease may seem a rather empty term. The same goes for the miller or exporter faced with unacceptable levels of vomitoxin/DON in wheat or barley coming to market.

But in the real world of production agriculture, where "silver bullet" solutions to serious problems seldom exist, steady incremental progress is a good thing. It means there's movement in the right direction, and it implies a continued chipping away at scab's detrimental impact on affected wheat and barley producers and buyers.

University of Kentucky wheat breeder David Van Sanford, co-chair of the U.S. Wheat and Barley Scab Initiative (USWBSI), says the Upper Midwest in 2005 provided a good illustration of both progress and challenge on the scab scene. Last year was a tough one for Fusarium Head Blight in the region, he notes; but what distinguished it from, say, 1993 was the fact that the bulk of economic loss was attributable to vomitoxin/DON discounts, not to reduced yield or test weight.

That's a simultaneous "good news/bad news" story.

On the good-news side, it means yield and test weight losses have been mitigated by the release of new varieties with improved resistance to FHB — especially in the hard red spring wheat sector. (There also has been significant progress in the breeding of more-resistant soft red and white wheat varieties, as well as in the release of better germplasm for barley and durum wheat breeding crosses.)

On the negative side, however, the 2005 Upper Midwest experience vividly illustrated that protecting yield and test weight is only half the battle; lowering DON levels is equally important. "There's much more awareness now in the marketplace about DON," Van Sanford points out, "and that's probably what's looming as the biggest challenge to us." Domestic millers — long concerned about DON for both economic and

food safety reasons — have increased empathy among the grain export community. The European Union, for example, is lowering its DON tolerance level to 1.25 parts per million as of July — down from the current 2.0 ppm — and that obviously has exporters concerned.

Along with the release of new wheat varieties with improved resistance to scab, Van Sanford points to other notable areas of recent progress in the campaign against scab. For example:

• On the breeding front, the uniform screening nurseries provide a systematic way to uniformly screen and evaluate germplasm at many locations throughout a region. This allows breeders to evaluate their own lines more thoroughly, and it gives them access to other promising germplasm that they might use as parents in crosses.

• Uniform fungicide performance trials have generated key data allowing six states to secure Section 18 labels for Folicur. These trials also confirmed the problem with strobiluron fungicides increasing DON concentration in the grain.

• On the applied technology end, research by North Dakota State University and Michigan State University ag engineers has resulted in new recommendations on the most effective water volumes and spray nozzle configurations for optimum fungicide coverage and efficacy.

• An improved multi-state disease forecasting system has resulted in better predictions of FHB infection. In 2005, for instance, the system produced an 80% accuracy rating in spring wheat areas and 68% accuracy across winter wheat regions.

• In the biotechnology arena, more and better molecular markers are now available to identify both scab-resistant and scab-susceptible genes, Van Sanford notes. Also, the VIGS gene silencing strategy constructed by USDA-ARS scientists located at Purdue University promises to be a very useful new tool for analyzing exactly what a specific plant gene contributes to FHB resistance.

For those farmers, millers, maltsters and exporters who deal directly with the effects of Fusarium Head Blight, the payoff from such progress can't come fast enough. Van Sanford – whose USWBSI co-chair is Minnesota wheat grower Tom Anderson — emphasizes the importance of the research community continually reminding itself of

"stakeholder needs." Those needs were first articulated back in the mid-1990s following huge scab problems in the Northern Plains and northern Corn Belt, and eventually led to the establishment of the U.S. Wheat and Barley Scab Initiative.

From fiscal 1999 through 2005, the USWBSI funded research to the tune of $32 million on the Fusarium Head Blight problem. Those monies were allocated to scientists at several USDA-ARS locations, approximately two dozen land grant universities and the International Maize and Wheat Improvement Center (CIMMYT).

The effort continues in 2006, with about $5.2 million in federal funding (from USDA-ARS) underwriting USWBSI scab-related research around the nation. "But we have to always remind ourselves how this money came to be and what are goals are," Van Sanford stresses.

In 2005, the Initiative underwent a reorganization of its research areas — the goal being to optimize the utilization of research funds and project results. Formerly, there were six research areas; now there are eight. All are focused on the understanding and control of this disease in order to minimize economic loss and maximize crop quality and food safety.

"We're very lucky, because we have a group of outstanding scientists working in the Initiative," Van Sanford says. "What we need to do, however, is just communicate better with each other and take advantage of our collective knowledge."

Given the troublesome levels of vomitoxin in 2005, Van Sanford anticipates major discussion this year in terms of what the Initiative should focus on to more comprehensively address the challenge of lowering DON. That discussion — which kicked off at the USWBSI steering committee meeting in late May — is a prelude to the development of a long-term strategic plan for the Initiative. "We've begun brainstorming to determine what we should be doing, what areas [of research] should be emphasized, and what areas perhaps should be de-emphasized or redirected," Van Sanford reports.

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