

Project 1: *Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.*

1. What major problem or issue is being resolved and how are you resolving it?

The problem we are addressing is the lack of FHB resistance in soft red winter wheat varieties adapted to Kentucky. Most varieties grown in our region are susceptible to FHB; thus, Kentucky wheat producers and end users are at risk for severe economic losses as a result of head scab epidemics.

This breeding process involves every year: 1) evaluating germplasm and breeding lines as parents for FHB resistance; 2) incorporating known resistance into crosses with elite, high yielding lines and cultivars, and 3) evaluating resistance in the progeny of the crosses. We are also evaluating F₂ and F₃ populations in inoculated nurseries so that only resistant segregates are brought forward and developed into lines that can be evaluated for the usual array of traits at multiple locations. We have approximately 300 single seed descent lines that have been genotyped as homozygous for the Sumai 3 resistance by the USDA-ARS genotyping lab in Raleigh, NC.

Field evaluation is carried out at two locations: Lexington, under mist irrigation with inoculum provided by the scabby corn method, and at Princeton in a non-irrigated nursery with a combination of conidial spray and scabby corn as inoculum sources.

**2. List the most important accomplishment and its impact (how is it being used?).
Complete all three sections (repeat sections for each major accomplishment):**

Accomplishment: Approximately 300 single seed descent lines genotyped as homozygous for the Sumai 3 resistance were planted in yield tests for the first time during the period covered by this grant.

Impact: This will have a big impact on our breeding program; tracking the resistance genes with markers will accelerate the delivery of resistant lines to the variety release track. It will also allow us to combine the Sumai 3 resistance with native resistance.

As a result of that accomplishment, what does your particular clientele, the scientific community, and agriculture as a whole have now that they didn't have before?

Breeders will have additional germplasm and parental lines to use in crosses for the development of scab resistant germplasm and varieties.

Include below a list of the publications, presentations, peer-reviewed articles, and non-peer reviewed articles written about your work that resulted from all of the projects included in the grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Mundell, N. and D. Van Sanford. 2006. Evaluation of Fusarium Head Blight Resistance in Soft Red Winter Wheat. In: Canty, S., A. Clark, and D. Van Sanford (Eds.), Proceedings from the 2006 National Fusarium Head Blight Forum; 2006 Dec 10-12; Research Triangle Park, NC. Lexington, KY: University of Kentucky. p. 113

Van Sanford, D. A. 2007. Head scab update. Presented at the North American Wheat Worker's Workshop, Saskatoon, Saskatchewan, CANADA, March 12-14