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Research Category: BAR-CP/VDHR

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Project Title: Screening Hordeum Germplasm for Resistance to Fusarium Head Blight and DON Accumulation.

PROJECT 2 ABSTRACT

(1 Page Limit)

To broaden the genetic base of FHB resistance in barley, additional sources of resistance need to be identified and exploited as soon as possible. We will cooperate in an accelerated screening effort of diverse *Hordeum* germplasm from genebank collections around the world and targeted to represent unique barley germplasm not screened in previous tests. During the next biennium (FY08 to FY10), we will: 1) evaluate and validate putative resistance sources of *Hordeum* for reaction to FHB; and; 2) make crosses between the resistant accessions and adapted breeding lines as part of a pre-breeding program. We propose to evaluate about 60 to 100 diverse winter barley accessions for reaction to FHB in replicated FHB nurseries at Blacksburg, Virginia. Winter barley accessions initially selected on the basis of FHB resistance and provided to Virginia Tech for testing will be planted each fall in a two rep test comprised of 4 ft headrow plots at Blacksburg, VA. The plots will be inoculated twice using either grain spawn and/or a conidial spore suspension. Equal amounts of two to six regional *F. graminearum* isolates will be applied uniformly throughout the nurseries. To maintain sufficient moisture on the spikes for optimal FHB infection, an overhead misting/irrigation system will be used. The lines will be assessed for FHB incidence and severity in the field, and grain samples will be harvested for DON toxin analyses. In addition routine agronomic data will be collected for traits such as heading date, height, spike type and other notable characteristics. Data will be entered, analyzed and provided to Dr. Steffenson for inclusion in reports and progress summaries provided to cooperators and the USWBSI community. Barley germplasm lines selected on the basis of FHB resistance and desirable agronomic type will be re-evaluated at Virginia Tech in subsequent years and will be used in the breeding program as parents to incorporate FHB resistance into adapted winter hulled and hulless barley varieties. The germplasm and information generated from this study will hasten the development of barley cultivars with FHB resistance and low DON accumulation. This, in turn, will minimize the threat of FHB and associated mycotoxins for producers, processors, and consumers.