

**PI: Smith, Kevin P.**

**PI's E-mail: [smith376@umn.edu](mailto:smith376@umn.edu)**

**Project ID: FY06-SM-137**

**FY05 ARS Agreement #: 59-0790-4-120**

**Research Area: EC/HQ**

**Duration of Award: 1 Year**

**Project Title: Multi-State Barley Winter Nursery - FY06 (05/06).**

### **PROJECT 1 ABSTRACT**

(1 Page Limit)

Fusarium head blight (FHB) threatens to reduce barley to an economically non-viable crop in the Midwest. Rapid deployment of FHB resistant barley varieties is essential to maintain barley production in this region. An essential component of breeding programs is the use of winter nurseries to advance lines through single seed decent and to produce seed that can be used in annual disease and yield trials. In our program, we make use of winter nurseries to accelerate development of resistant varieties. Two primary activities take place at our winter nursery sites. The first is to grow out single F4 plants from populations that are segregating for FHB resistance. In some cases, we sow long rows of 200-300 space-planted plants and in other cases we sow around 100 lightly seeded rows for each populations. Then in the early spring, we harvest seed from individual plants. Since these plants are spaced out, they produce many tillers and provide far more seed than we can produce in the greenhouse. This provides sufficient seed for us to conduct FHB screening using replicated single-row plots in misted FHB nurseries at two locations. It also provides enough seed for a fifth row that can be planted outside the nursery and used for quality analysis. The second activity is to increase seed for use in first year yield trials. In this case, we plant head-rows of promising lines that were selected on the basis of disease resistance and other agronomic traits. Rows planted in the winter nursery are selected for harvest based on visual assessment of agronomic traits the winter nursery as well as by data that is analyzed after the Minnesota growing season such as DON concentration in grain and malting quality. Selected rows are harvested, threshed and approximately 300 g of seed for each line is shipped back to Minnesota to be used in preliminary yield trials and second year FHB disease screening. The two winter nursery sites that our project uses are in Yuma, AZ and near Christchurch, New Zealand. In previous years, the American Malting Barley Association (AMBA) has provided funding for winter nursery costs. This year AMBA discontinued that program leaving the barley breeding programs short of funding to conduct this essential research. This proposal requests funds for winter nursery costs for the University of Minnesota Barley Breeding Program to help hasten the development of FHB resistant varieties.