

**PI: Kleinhofs, Andris**

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

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**Project Title: Genetic and Physical Mapping of the chr. 2H Bin 10 FHB Resistance QTL and Development of Recombinant Lines and Mutants to Facilitate Breeding.**

### **PROJECT 1 ABSTRACT**

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#### **Genetic and physical mapping of the chr. 2H bin 10 FHB resistance QTL and development of recombinant lines and mutants to facilitate breeding.**

Our ultimate **goal** is to facilitate the development of malting barley cultivars with commercially acceptable FHB resistance. Towards this goal we are working to clone the gene (or genes) responsible for the major Fusarium Head Blight (FHB) resistance quantitative trait locus (QTL) found on barley chromosome 2(2H). This is a long-term goal and a more immediate goal is to develop a physical map of the region. Recombinant lines containing small CI4196 genomic regions in a commercially acceptable malting genomic background will limited the size of the region involved in FHB resistance. This may also be suitable germplasm for plant breeders. An innovate approach is to use mutagenesis and isolate mutants that retain CI4196 FHB resistance, but are better breeding parents by virtue of earlier maturity, shorter stature and 6-rowed head type.

#### **The specific objectives for this year are:**

- 1) develop a saturated genetic and physical map of the chromosome 2(2H) FHB QTL region with emphasis on bin 10**
- 2) test mutants selected during 2006 and 2007 grant year for resistance to FHB. Make appropriate crosses to "clean up" mutants, determine heritability, and map those of special interest.**
- 3) screen the 2007 mutagenized population of CI4196 for Vrs1 mutants**
- 4) continue evaluating for FHB resistance and improving recombinant lines**

The main emphasis of work will be on developing a saturated genetic and physical map of the chromosome 2H FHB resistance QTL region. This is accomplished through identifying molecular markers that map to the region of interest via rice synteny and published molecular maps. During the past two years we have identified interesting early, semi-dwarf and intermedium head type mutants. We are still looking for an actual Vrs1 mutant which is required together with the Int-c mutant to produce a agronomically acceptable 6-rowed spike. Isolines and mutants will be assayed for FHB resistance in China and North Dakota by Rich Horsley. If FHB tolerance is confirmed, they will be available for use in breeding.