

PI: Ohm, Herbert**PI's E-mail: hohm@purdue.edu****Project ID: FY07-OH-051****FY06 ARS Agreement #: 59-0790-4-118****Research Area: HGR****Duration of Award: 1 Year****Project Title: Introgression of Fusarium Head Blight Resistance of *Thinopyrum* into Wheat.****PROJECT 1 ABSTRACT**

(1 Page Limit)

The goal of this project is to develop germplasm with a novel source of resistance that has a large effect against Fusarium head blight (FHB) when added to breeding lines already possessing other sources or types of FHB resistance. This novel resistance introgressed from *Thinopyrum ponticum* located on a 7DS·7DL-7e₂L translocation has 1/3 of the distal part of the long arm of chromosome 7e₂. Wheat lines resulting from three cycles of backcrossing to winter wheat and four cycles of backcrossing to spring wheat will be completed by May, 2007. The resulting backcross F₂ populations will be grown in the fall greenhouse, 2007 and highly resistant plants homozygous for the translocation and for resistance from wheat will be selected with the aid of DNA markers specific to the *Th. ponticum* translocation and markers that have been reported to be closely linked with specific FHB resistance QTL from wheat. Three-way and four-way crosses will also be carried out in the breeding program. Progenies of the crosses not only will be selected for FHB resistance, but also will be selected for plant type and resistance to other pathogens in field conditions. The expected result is to obtain several adapted germplasm lines by summer 2008 that combine the FHB low incidence of Goldfield with type II resistance derived from *Th. ponticum*, Sumai 3, and Fundulea 201R. The resulting winter and spring wheat germplasm lines will be registered in Crop Science and made available to the wheat research community. In the meantime, near-isogenic lines with and without the translocation will be obtained by backcrossing. Three and four cycles of backcrosses will recover 94% and 97%, respectively, of the recurrent parent genome. They should be excellent genetic materials for gene expression studies and are expected to be valuable in breeding cultivars for FHB resistance.

The effectiveness of the resistance of *Th. ponticum* in different genetic backgrounds will also be assessed in these segregating backcross populations. By tagging with DNA markers closely linked to *Fhb1* and other FHB resistance QTLs from wheat, and the 7e₂ translocation, we can determine if the resistance QTL from *Th. ponticum* augments effects of other FHB resistance QTL in the two (spring and winter) populations of adapted wheat.