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Research Area: BIO
Duration of Award: 1 Year

Project Title: Development and Testing of Transgenic Barley for FHB Resistance.

PROJECT 1 ABSTRACT
(1 Page Limit)

Fusarium head blight (FHB), caused mainly by *Fusarium graminearum*, is a serious disease problem of barley in the Northern Plains area. The outbreak in the 1990's resulted in huge economic loss to growers. The fungus also produces the mycotoxin deoxynivalenol (DON) in infected grains which poses safety concerns for human and livestock. This project aims to provide additional genes for FHB resistance and low DON for breeding resistant barley cultivars. The objective of this project is to test homozygous transgenic as well as backcross-derived lines developed from previous and current USWBSI grants, for their reaction to FHB and DON level in the field.

Two antitoxin genes and five antifungal genes have been used to generate transgenic barley plants. A combination of anti-fungal and anti-toxin genes may provide transgenic plants that exhibit better resistance to fungi infection, reducing DON levels in barley and other small grains, and preventing significant economic loss. Transgenic lines containing pairs of genes, and transgenic and backcross-derived lines lacking somaclonal variation expressing single or pairs of genes, will be tested in the field to determine the effects of single and combinations of genes on FHB resistance and DON levels.

This project fits in the biotechnology research area, specifically the first two priorities, to transform and test adapted barley cultivars with anti-*Fusarium* genes.