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Project ID: 0506-MA-036

FY04 ARS Agreement #: New

Research Area: BIO

Duration of Award: 1 Year

Project Title: Detoxification of the Mycotoxin, Deoxynivalenol, by Expressing UDP-Glucosyltransferase in Barley.

PROJECT 1 ABSTRACT
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Fusarium Head Blight (FHB), caused primarily by *Fusarium graminearum*, has been one of the most destructive diseases of barley in the USA since the early 1990s, resulting in huge economic losses for growers. The fungus produces the mycotoxin deoxynivalenol (DON), a protein synthesis inhibitor and potential pathogen virulence factor, which is harmful to humans and livestock. Combating FHB and reducing DON concentration in the grain is a challenging task for breeders, as only partial, multigenic sources of resistance have been identified. DON functions as a virulence factor and therefore detoxification of DON could reduce FHB infection. The objective of this project is to produce transgenic barley expressing an anti-toxin gene that may detoxify DON and limit FHB infection. The anti-toxin gene DOGT1, encoding UDP-glucosyltransferase, will be inserted into barley through *Agrobacterium tumefaciens*. DOGT1, isolated from *Arabidopsis thaliana*, was able to detoxify DON by catalyzing the transfer of glucose from UDP-glucose to the hydroxyl group at carbon 3 of DON. The barley cultivar Conlon will be used for generating transgenic plants. Homozygous transgenic plants will be tested against FHB in the greenhouse and field. This project fits in the biotechnology (BIO) research area under transformation with anti-*Fusarium* genes.