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Project Title: Differential DON Accumulation from Pre-head Foliar-applied Fungicide Application.

PROJECT 1 ABSTRACT

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The primary objective of this research is to determine whether commonly accepted leaf disease management strategies of wheat which incorporate a fungicide application at the 4 to 5 leaf stage (Feekes growth stage 2) or later promote increased levels of DON in FHB-diseased grain compared with the non-treated control. If, in fact, the phenomenon occurs here as it has reportedly done in Europe and elsewhere, a secondary objective of this project will be to identify environmental and pathogen triggers that contribute to increased DON levels via field- and controlled-environment experiments.

Results from replicated, small plot research trials conducted at several commercial field locations in the Red River Valley on spring wheat during 2003-04 indicate that an application of Headline (pyraclostrobin) at full flag leaf emergence significantly increased DON concentration in grain compared to the no fungicide treatment. Additionally, in single year research during 2007, conducted near Crookston, Reeder spring wheat showed significantly greater DON levels after a Quilt (propiconazole and azoxystrobin) or Headline (pyraclostrobin) application treatment at Feekes 2 compared with the no fungicide control treatment. This could have disease management implications for cereal producers and chemical companies.

An experiment will be established near Crookston where corn or small grain crop residue is present. The experiment will contain three wheat cultivars selected for different levels of FHB resistance and will be exposed to local levels of disease inoculum as well as natural weather conditions.

Fungicide application treatments will begin at approx. Feekes 2 which coincides with the timing of disease management for tan spot. Subsequent timing of fungicide application will occur weekly thereafter, regardless of plant growth stage development until plants reach the flowering growth stage. One triazole, one strobilurin, and two triazole-strobilurin premixes will be used. Data regarding FHB symptoms, weather conditions, grain yield and quality will be recorded, analyzed, and reported to the scientific and agricultural communities.

The objectives of this experiment will be to determine DON response to cultivar resistance, fungicide, application timing, and environment. This project addresses research priorities in the FHB Management research area such as enhancing communication and end user education/outreach, and developing a full understanding of specific environmental and biological factors influencing infection and toxin accumulation.