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Project Title: Developing and Disseminating Integrated Management Practices for Control of FHB in Wheat and Barley.

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium Head Blight (FHB) continues to be one of the most serious constraints to small grain production in North Dakota. No one practice currently is capable of providing total FHB control; an integrated approach is needed. Current best management practices include the use of cultivars with genetic resistance/tolerance, rotations, and the judicious use of fungicides. Seeding rate and canopy architecture were identified in a workshop on Integrated FHB Control in August 2006 as management practices that could possibly impact FHB development and control, though relevant data were lacking to confirm this hypothesis. Research on other pathosystems of small grains has found that canopy architecture can influence disease development. Seeding density can also alter the proportion of main stems to total stems in a given area and influence uniformity in flowering date. The objective of the proposed research is to quantify the effect of seeding rate and plant spatial arrangement on the development of FHB and its control when integrated with other best management practices in spring wheat and barley. Experiments in 2007 and 2008 showed promising results but scab pressure was extremely low. In 2009, experiments consisting of a factorial combination of row spacing, seeding rate, fungicide application and genotype will be established in Prosper, Minot and Osnabrock. This research will answer the following questions: Can FHB and DON be reduced by changing row spacing and plant density in wheat (durum and spring) and barley without reducing yield? What will be the impact of changes in row spacing and plant population on the uniformity of flowering and the control of FHB with fungicides? Are there additive or synergist effects in FHB control to be achieved by combining improved spatial arrangement and plant density with resistant varieties and fungicides? Potentially this research will be able to identify additional management practices that can be included in an integrated FHB control program to reduce FHB related losses and improve the profitability of small grain production in ND. There is limited information on the level of adoption of currently recommended management practices. A second objective of this research will be to determine the rate of adoption of and integration of management practices by farmers through surveys, farmer group discussions and with audience response devices at extension meetings. Data will be collected on growers' understanding of scab, current wheat and barley management practices that are used to control scab, perceived effectiveness of practices employed, use of disease forecasting models, and how farmers obtain information on scab management practices. This information will allow us to assess the impact of our current recommendations and help in designing programs and materials for extending scab-related information in the future.