

PI: Neate, Stephen M.

PI's E-mail: stephen.neate@ndsu.nodak.edu

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Project Title: Quantification of Spores of *Fusarium graminearum* using a Quick and Accurate ELISA Method.

PROJECT 2 ABSTRACT

This is the second year of a project addressing the need for a quick, cheap and simple method of quantifying spores of *Fusarium graminearum*. The technique has wide application and will allow researchers investigating the effect of chemical and cultural control to quantify the impact of their treatments on within crop spore production.

Fusarium head blight (FHB) has reduced the quality of barley grown in the Midwest for the last decade due to fungus infected kernels, pinched grain and the presence of the toxin, deoxynivalenol (DON). Individual cultural and chemical control measures have reduced disease, but have been unsuccessful in getting the level of control necessary for the requirements of the malting barley industry. Production of malting quality barley in this region will require an integrated approach to control which includes cultural practices, fungicides, and genetic resistance.

Currently the quantification and identification of *F. graminearum* involves spore trapping, isolation, subculturing and microscopic study of morphological characters such as spore shape and size and hyphae. Most stages in this slow process require technical experience to be efficient and successful. Alternatively molecular methods are increasingly being used but these require expensive equipment, experienced operators and still require an atmospheric sample for analysis.

The technique being developed will utilize a small cheap and efficient volumetric spore trapping device and an ELISA system using antibodies which are specific to *F. graminearum*. The outcome of this project will be the development of a series of protocols that can be used for quantitative ELISA detection of spores of *F. graminearum* in the atmosphere.