PI: Dyer, Alan **PI's E-mail: adyer@montana.edu**

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PROJECT 1 ABSTRACT

(1 Page Limit)

Agriculture is the largest source of income for Montana with small grains representing 37% of all agricultural income. Montana's wheat acreage typically yields less that other states and therefore profit margins for producers are heavily tied to premiums paid for wheat quality. Currently, Montana is in the fourth year of a Fusarium head blight (FHB) epidemic. FHB causes two main problems for Montana's wheat producers. These are yield reductions, with infection rates as high as 50%; and reduction or perceived reduction in grain quality due mycotoxins (deoxynivalenol). In Montana's 2006 FHB trials, FHB resistant wheat lines when coupled with Folicur application and best farming practices had acceptable DON levels but displayed other agronomic deficiencies which are detrimental to production in Montana's wheat production systems. These deficiencies included lodging, delayed flowering, and high susceptibility to ergot (*Claviceps purpurea)*. The goal of this proposal is the development of scab resistant wheat varieties adapted to Montana's wheat production systems and until that time, to work out the best possible solutions with the tools currently available. The objectives for this proposal are to: 1) Evaluate performance of FHB resistant spring wheat varieties under natural disease pressure in irrigated wheat fields, 2) Incorporate the Sumai3 FHB resistance genes into wheat lines using markers, Barc 133 and GWM 533, and 3) Screen wheat lines and varieties with Sumai3 FHB resistance genes by the single spikelet method of inoculation in the greenhouse.. To accomplish these objectives, we will continue to evaluate the agronomic performance of varieties and lines with FHB resistance under irrigated field conditions in Manhattan, Montana. We will confirm the incorporation of FHB resistance in breeding lines and varieties by assaying for phenotypic expression in greenhouse inoculation experiments. In accomplishing the objectives, the participants will be obtaining important information for Montana's growers and will be actively communicating the results to impacted growers throughout Montana.