PI: Melanie Caffe-Treml **PI's E-mail: Melanie.caffe@sdstate.edu**

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Project Title: Enhancing FHB Resistance and Reducing DON in Winter Wheat for South Dakota.

PROJECT 1 ABSTRACT

(1 Page Limit)

Occurrence of Fusarium Head Blight (FHB) epidemic is not uncommon in South Dakota. Such epidemics can result in significant yield losses and reduced grain quality. Moreover, the presence of deoxynivalenol (DON) in infected grain reduces its marketability. It is therefore strategic that varieties with good level of FHB resistance be made available to producers in South Dakota. Our primary goal is to rapidly develop and release new winter wheat varieties with enhanced FHB resistance and reduced DON content, and to develop those varieties such that they exhibit excellent agronomic performance in South Dakota. The breeding program will perform crosses to pyramid *Fhb-1* into South Dakota breeding materials along with native and new sources of resistance to FHB. Sources of resistance will include released varieties exhibiting high to moderate levels of resistance to FHB, such as; Lyman, Everest, and Overland, as well as some of the program's most advanced breeding lines that express resistance to FHB. Breeding lines developed from crosses made with some Wesley-Fhb1 backcross lines are also being used as key parents for transferring resistance. All sources of resistance are adapted to South Dakota and the region, and therefore, their use in crosses is expected to result in the quick development of varieties with enhanced FHB resistance and excellent agronomic performance. As lines with resistance are advanced through various yield trial nurseries, they will be evaluated in an inoculated mist-irrigated field nursery. To help with selecting the most resistant line, the incidence, severity, and FHB index will be determined, as will Fusarium damaged kernels (FDK) and DON content. In addition, breeding lines and released cultivars from other public and private breeding programs will be evaluated in a mist-irrigated and inoculated FHB field nursery and in several environments where FHB is expected to occur naturally. Results will be shared with other participating breeding programs and extension specialists. Data on FHB resistant varieties will be made available to stakeholders and producers through SDSU Crop Performance Testing (CPT) publications and will be presented to producers during field day events.