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Project Title: Determining the Contribution of Secondary Tillers to Total DON Concentration.

PROJECT 3 ABSTRACT

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Studies in the past have reported that late infection of wheat and barley results in low disease development but high DON concentration. Formation of higher number of tillers is desirable as it has positive impact on final grain yield. Lateral tillers of wheat and barley, however, have delayed physiological development, which might correlate with the late infection findings. Studies addressing the contribution of secondary tillers in final DON concentration are limited. This project aims to improve our understanding of the relationship between FHB symptoms and DON concentration by examining the contribution of main stem and secondary tillers as it relates to the final DON concentration.

Experiments, established as quasi split-split-split plot design with five replications, will be conducted in North and South Dakota with moderately resistant and susceptible cultivars of each spring wheat, winter wheat or durum and barley. Two inoculation time treatments will be applied; one at the anthesis of main stem and another at anthesis of tillers followed by 7 days misting to promote disease development. FHB incidence and severity will be assessed at soft dough growth stage. Heads from main stem and tillers will be harvested separately, analyzed for visually scabby kernels and deoxynivalenol following standard protocols.

An understanding of the contribution of secondary tillers in final DON levels in *Fusarium*-infected wheat and barley heads can be used in disease management, as farmers can use cultivar selection based on tiller numbers depending upon the contribution they provide to DON levels. Adjustments in planting density may also help to manipulate tillering in wheat and barley as required. Further, knowledge obtained from the study might be useful to breeders so that they can consider tillering characteristics in FHB resistant cultivar breeding. The result from this study might also be useful in decision-making process for farmers to pick the suitable time for fungicide application.