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Project Title: Develop Durum Wheat Resistant to Fusarium Head Blight

PROJECT 1 ABSTRACT
(1 Page Limit)

Durum wheat (*Triticum turgidum* L. ssp. *durum* Desf.) is one of the major cereal crops in the world and its production in North Dakota accounts for about 60% of the U.S. production. Durum wheat is very susceptible to Fusarium head blight (FHB) caused by the fungus *Fusarium graminearum* Schwabe (telomorph *Gibberella zeae* (Schw.) Petch. Fungicides may reduce the disease, but the most environmentally safe and economical way to control the disease is with genetic resistance.

The main objective of this project is to develop FHB resistant durum wheat germplasm (lines/cultivars) with good agronomic traits for producers and possess good quality for the domestic pasta industry and the international export market. More specific objectives are:

a) Breeding FHB-resistant durum wheat.
b) Screen durum populations/experimental lines for FHB resistance in greenhouses and irrigated field nurseries.
c) Evaluate experimental lines for DON.
d) Use marker assisted selection at the USDA-ARS genotyping center in Fargo, ND for valuable loci.
e) Evaluate identified FHB resistant lines for quality.
f) Develop new populations by crossing adapted germplasm to newly identified sources of resistance.

We will develop populations by crossing identified sources of resistance to adapted germplasm with the objective of developing improved FHB resistant germplasm to producers and pasta manufactures. This is an ongoing project that every year we will have crosses and different generations for FHB screening and yield and quality evaluations. The annual durum wheat production in North Dakota from 2016 to 2018 averaged 1.2 million tons having an average annual value of $218 million. The new cultivars ND Riveland, ND Grano, Divide, Carpio, and Joppa have better tolerance to FHB than the older cultivars. If breeding for increasing yield and/or FHB resistance would increase production by 2%, it will add approximately 4.3 million dollars to the USWBSI stakeholders/end-users.