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Project ID: 0304-JA-067 **ARS Agreement #: NA**
Research Area: GIE **Duration of Award: 1 Year**

Project Title: Transfer of scab resistance from wild relatives into durum wheat.

PROJECT 1 ABSTRACT
(1 Page Limit)

Durum wheat or macaroni wheat is an important cereal crop used for human consumption worldwide. It is an important crop of the Northern Great Plains of the United States, especially for the state of North Dakota, which is the number one durum producer. Scab or Fusarium head blight (FHB) is a devastating disease of wheat. Because there is no FHB resistance in current durum cultivars we used wild relatives of wheat as donors of resistance. Hybridization with perennial wild grasses is helpful in transferring desirable traits into durum wheat. We earlier found *Lophopyrum elongatum* to be an excellent source of resistance to FHB. To transfer this resistance to durum wheat, we crossed two cultivars, Lloyd and Langdon, with the wild grasses and produced fertile hybrid derivatives with the full chromosome complement of durum wheat plus a few chromosomes or chromosome segments of *L. elongatum*. We will continue work on the hybrid derivatives with alien chromosome integrations that we produced earlier. By successive backcrossing and selfing we will attempt to stabilize wheat-alien chromosome integrations. Furthermore, to enhance pairing and improve alien integrations into the durum genome, Langdon 5D(5B) substitution will be used in producing F_1 hybrids and in backcrosses. Fluorescent genomic *in situ* hybridization will be used to characterize alien chromatin integrations into the durum genome. We plan to adopt another strategy, i.e., that is to produce alien addition lines of durum wheat with *L. elongatum* chromosomes. We have recently isolated some promising monosomic and disomic additions. We will attempt to produce a large number of disomic additions, screen them for scab resistance, and isolate the most promising addition lines. Once we have identified such additions we will use radiation treatments to translocate desirable segments from alien chromosomes into the durum genome.