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Project Title: Identity Novel Haplotypes in Durum with Superior Scab Resistance and Performance

PROJECT 1 ABSTRACT

(1 Page Limit)

Durum wheat (*Triticum durum*) is global staple crop that is highly vulnerable to Fusarium head blight (FHB) or scab. Without resistant cultivars, durum production has decreased and migrated into regions with lower disease pressure, limiting the yield potential of the crop. Recent germplasm development efforts have produced lines with high level of FHB resistance, low DON, and good agronomic traits. This genetic combination has been exceedingly difficult to obtain in the past, and the main objective of this proposal is to understand the special genetic determinants (polymorphisms, haplotypes, & epigenetic markers) of these lines using new sequencing techniques. Once potential genetic determinants are discovered, we will convert these into high-through screening tools and screen ~800 progeny individuals derived from crosses with the promising lines and durum breeding germplasm that have been evaluated previously. Using association mapping and molecular regression, we aim to validate this information and hone the screening designs to ensure excellent performance for large scale implementation to accelerate the breeding of resistant lines for the future.