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EXPLORING G X E X M SYNERGIES TO ENHANCE DURUM WHEAT PRODUCTION SYSTEMS

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Durum wheat (*Triticum turgidum* L. var *durum* Desf.) producers face a range of challenges associated with growing wheat across the latitudes that comprise the Central and Great Plains of North America. A range of abiotic (frost damage) and biotic (disease and insect pests) threaten the ability to harvest grain that meets the strict quality parameters specified by export market end-users. The most serious are the biotic threats Fusarium head blight (FHB) caused by *Fusarium graminearum* Schwabe [telomorph:*Gibberella zeae* Schwein (Petch)], and wheat stem sawfly *Cephus cinctus* Norton (Hymenoptera: *Cephidae*), which must be managed with practices that protect yield and quality targets. Durum is particularly vulnerable given that all production occurs within the distribution areas for both of these threats. Moreover, genetic progress to develop cultivars resistant to FHB lags behind other wheat classes. Thus, successful FHB and WSS mitigation are ideal case studies in Genotype (G) x Environment (E) x Management (M) interactions where superior cultivars (G) are grown in at-risk regions (E), and require unique approaches to management (M) for sustainable durum production. For agronomists and producers, the key to overcoming production challenges is to harness the synergies from GxExM interactions to develop durum production systems that suit specific agroecozones and close the yield gap between what is genetically possible vs. what is attained at the farm level. This paper will explore how select management strategies can be refined to exploit this integrated approach in modern durum production systems.

ABSTRACT