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STEM RUST RESISTANCE IN DURUM WHEAT AND OTHER WHEAT RELATIVES

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Stem rust of cereal crops, caused by *Puccinia graminis* f. sp. *tritici*, can cause significant yield loses. Crop failures of large-scale may occur when stem rust develops into epidemic proportions. For more than a half century, stem rust in most wheat producing regions has been under effective control through the use of host resistance and/or eradication of the alternate host, common barberry (*Berberis vulgaris*). However, recently emerged pathogen races, such as races in the Ug99 race group, possess broad virulences that have rendered most resistance genes in adapted cultivars ineffective and pose serious threats to wheat production. In order to identify new sources of resistance, we conducted large-scale evaluations of the primary, secondary, and tertiary gene pools of wheat. Diverse sources of resistance identified in cultivated and wild tetraploid wheats of the AB genome, probable genes conferring the observed resistance, and their reactions to various virulence combinations. The usefulness of these resistant sources was further characterized by evaluating stem rust responses of synthetic wheat.

ABSTRACT