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Introgression of Improved Root Biomass Traits into Wheat Hybrids

Authors : F. N. U. Abdullah, A. M. H. Ibrahim, Shuyu Liu

Abstract : Hybrid wheat root system is the major plant organ for water and nutrient acquisition. An initial wheat root study with Winrhizo scanner showed that entries with high root surface area but narrow root angle are associated with past drought tolerance in Texas, while those with wide angle can perform best under normal growing conditions. In a hybrid field experiment, commercial heterosis up to 8.3% in grain yield was obtained from diverse parents selected from male and female diverse groups. These hybrids showed promising yield at Greenville and McGregor, Texas, with grain yield up to 4412 Kg ha^{-1} as compared to best performing commercial varieties 'TAM-304' (4075 Kg ha^{-1}) and 'Gallagher' (3981 Kg ha^{-1}). Among 130 hybrids produced, a subset of 50 better-performing hybrids and parents was subjected to one-month-old plant root studies scanned with Winrhizo. The results showed a significant positive correlation of grain yield with initial root angle and a negative correlation with root length.

Keywords : hybrids, root studies, heterosis, wheat breeding
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