عنوان مقاله:

Variations of Grain Yield and Agro-Morphological Traits of Some Promising Durum Wheat Lines (Triticum turgidum L. var. durum) at Zinc Sufficient and Deficient Conditions

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خلاصه مقاله:

Successful production and development of stable and adaptable genotypes only depend on the positive results achieved from the interaction between genotype and environment that consequently has a significant impact on breeding strategies. In this regard, we conducted an experiment to study genotypic differences of 16 lines durum wheat under both zinc sufficient and deficient stress during 2014-2015 growing seasons in University of Maragheh, Iran. Our results showed that Zn stress significantly ($P < 0.001$) affected all studied traits among the lines. The interaction between zinc stress conditions (C) and lines (L) was significant for peduncle length and plant height. Our findings indicated that zinc-deficient stress significantly reduced spike length (6.8%), spike dry weights (19.1%), plant height (12.0%), peduncle length (15.2%) and peduncle dry weights (26.7%). Zinc deficient stress also decreased the number of grains per spike, number of fertile spikelet per spike, thousand grain weight, biological yield, grain yield, and harvest index by 29.2, 15.5, 5.1, 24.1, 32.5, and 10.5%, respectively. The results showed that line numbers of 2 (G2, 4025) and 5 (G5, 46202) produced the lowest and highest spike length (SL) and spike weight (SW), number of grains per spike (NGS), and number of fertile spikelet (NFT), respectively; while line numbers of 10 (G10, 45704) and 14 (G14, 45415) produced the highest and line numbers of 1 (G1, 4017), 11 (G11, 45667), and 12 (G12, 45632) produced the lowest grain yield (GY), and harvest index (HI), respectively. Under non-zinc deficient stress and zinc deficient stress, GY was positively associated ($P < 0.001$) with STI, GMP, MP, and HARM as well as negatively correlated ($P < 0.001$) with SSI under zinc-deficient stress. Accordingly, indices of STI, GMP, MP, and HARM were the best indices for identification of high yielding lines in both conditions (zinc deficient tolerant lines). In total, results showed that G14 (45415) and G10 (45704) lines relatively identified as zinc tolerant and G1 (4017), G2 (4025), and G11 (45667) lines identified as susceptible lines.

کلمات کلیدی:

Genetic diversity, Durum wheat, Agro-morphological traits, Zinc deficient resistance indices