



Selection of salt tolerant wheat for reuse of saline soil and water in arid region

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A large portion of Iran is located in an arid to semi-arid region. Due to limited fresh water resources, the utilization of saline water is critical for land irrigation. Therefore, selection and breeding for salt tolerance cultivars are required to enhance yield in saline conditions. The responses of 60-wheat cultivars/lines from cold, temperate and hot regions of Iran to salinity were evaluated in germinator study in petri dish, in the container and in field conditions. In germinator study, the percent seed germination decreased by increasing the salinity of applied water. The percent seed germination for river water ($EC_i > 2 \text{ dS m}^{-1}$, 10 dS m^{-1} , 15 dS m^{-1} and drainage water ($EC = 20 \text{ dS m}^{-1}$) were 86%, 76%, 53% and 48 %, respectively. The effects of wheat cultivars/lines, irrigation water salinity and the cultivars/lines \times irrigation water salinity on seed germination and germination rate were significant ($P > 0.01$) (The highest and lowest germination rates were resulted from line No. 8 (M-75-8, 37.7 seeds day⁻¹) and 3 (M-75-3, 16.7 seeds day⁻¹), respectively. In the container study, by increasing the salinity of water, germination percentage decreased. The highest germination percentage and germination rate, were 84.12 and 37.02 seeds day⁻¹ in river water treatments and the lowest germination percentage and germination rate, were 44.8 and 12.5 seeds day⁻¹ in drainage water ($EC_i = 8 \text{ dS m}^{-1}$). In the field experiment the effect of cultivars on seed and biological yield were significant ($P > 0.01$) (The line C-75-2, line C-75-3 and Roshan applying 8 dS m^{-1} saline irrigation water resulted in the highest grain yield of 3052, 2818, 2792 kg ha⁻¹ and biological yield of 1075, 1100 and 1100 kg ha⁻¹, respectively. In 12 dS m^{-1} irrigation water treatment the highest grain and biological yield of 2663 kg ha⁻¹ and 9750 kg ha⁻¹ were obtained from line No. 2) C-75-2) and line No. 11 (M-75-7), respectively. The lines No. 2 and 3 that showed high grain and biological yields also had high grain quality.

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