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Water Use Efficiency of Sunflower Genotypes under Drip Irrigation

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Abstract

This investigation was conducted to determine the productivity and water use efficiency for new sunflower genotypes obtained from selfing and induce mutation. Ten sunflower genotypes were evaluated under drip irrigation using two treatments of irrigation (100 and 70 % from water requirement of sunflower). Statistical analysis showed that there were significant differences among genotypes, as well as between irrigation treatments and the interaction between them. The interaction between irrigation treatments and genotypes was significant in all studied traits except for head diameter. Results indicate that decreasing the amount of irrigation water from 1500 to 1130 mm ha⁻¹ significantly reduced all studied traits. The conspicuous differences among the genotypes suggest the presence of genetic differences and this illustrates the using of selfing and induce the mutations in the creation of new recombination differ significantly from its parents. Mutation (M1-63) surpassed all the other one genotypes in seed yield and water use efficiency (WUE). Lines which gave the highest seed yield have a WUE under drought conditions higher than WUE under normal irrigation. The lowest depression in seed yield due to drought conditions compared to the seed yield under normal irrigation has been registered for Line 20, Line M1-63 and Sakha 53 genotypes (11, 18 and 16 %, respectively), but the highest depression recorded for Line 48 , Line M3-63 and Line M4-63 (49, 46 and 43 %, respectively). The genotypes (Line 20, Line M1-63 and Sakha 53) are more drought tolerant than others and can be used in breeding programme to develop sunflower hybrids suitable for cultivation under drought conditions.

Keywords: Inbred lines, mutation, sunflower genotypes, water use efficiency