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CHARACTERIZATION OF STAY GREEN MUTANTS AND RECOMBINANTS FOR DROUGHT TOLERANCE IN SUNFLOWER

Stay green is an economically important and complex trait for drought tolerance. The present investigation was conducted to identify the drought tolerant stay-green genotypes with desirable root traits which are essential to extract moisture from deeper layers of the soil under drought conditions. The study comprises three non-stay-green checks and seven Alternaria disease resistant stay-green genotypes identified from the mutants: DSR 14 derived from 200Gy gamma irradiation and DSR 57 derived from 0.020 mol/dm3 EMS treatment and recombinant populations. These genotypes have been characterized for root architecture under different soil moisture regimes in factorial RBD design. Analysis of variance revealed significant interaction between the genotypes and different water regimes and among the genotypes. The mutant DSR 14 and recombinant DSR 47 have exhibited higher mean root length of 102.50 cm each, higher root to shoot ratio (0.87 and 1.00) and leaf area (151.35 cm2 and 137.70 cm2) under severe stress condition. However, despite of the stay-green nature, EMS mutant DSR 57 and other stay-green recombinants exhibited the poor performance for root traits and seed yield per plant under drought conditions indicating only the cosmetic nature of their stay green trait. The average seed yield per plant for these identified genotypes, DSR 14 (13.74 g) and DSR 47 (12.38 g) was higher than that of the checks, Morden (5.38 g), RHA 6D-1(2.75 g) and RHA 95C-1 (3.55 g) and over other stay-green mutant and recombinants under severe low moisture stress condition. Hence, the present investigation revealed that the gamma irradiation treatment yielded a functional stay green mutant which can be further utilized for breeding for drought tolerance and to understand the genetic nature of this functional stay-green trait to further improve the crop.

Country or International Organization

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