



Genetic Variability and Stability for Seed Yield Related Traits in Seed Purpose Watermelon Genotypes under Rainfed Situations of Hot Arid Zone

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Abstract: Forty one genotypes of seed purpose watermelon were evaluated under rainfed conditions of Jaisalmer for their seed yield stability during kharif 2011 to 2013. Among the genotypes variability was fairly conspicuous for seed size, shape, color and seed distribution pattern inside the fruit flesh. Number of fruits, fruit yield and seed yield per plant exhibited high heritability coupled with high genetic advance as per cent of mean. The analysis of variance showed significant differences among the genotypes and environments for seed yield and other contributory traits. Four genotypes viz., SKNK-683, SKNK-112, SKGPK-26 and SKGPK-30 remained stable over seasons, meanwhile genotypes viz., DRB-675, DRB-677, SKNK-665, SKNK-679, SKNK-903, SKGPK-22, SKGPK-24, SKGPK-31 and SPS-8 performed better in good rainfall year. These genotypes can be used in further breeding programs for development of high seed yield genotypes of watermelon for different situations of hot arid zone.

Key words: Stability, seed purpose watermelon, rainfed, genetic parameters.

Watermelon (*Citrullus lanatus* (Thunb.) Matsum. & Nakai) is well-known cucurbit for its fleshy, juicy and sweet fruits world over and cultivated as cash crop. On the other hand in Indian hot arid zone where it is popularly known as 'Mateera' it is being cultivated as mixed crop during kharif with pearl millet and or clusterbean under rainfed conditions mainly because of its highly priced nutritious seeds and fodder for cattle. Its seed price ranges from Rs. 6000-8000 per quintal in local market thus, supporting the livelihoods of rural people of the arid zone in a big way (Mahla and Singh, 2013). The seeds of watermelon are in great demand in local, national and international market and used in different culinary preparations. The roasted seeds are taken as a common snack in western Rajasthan and north Gujarat while after removal of seed coat it is mainly used in dressing of sweets and pharmaceuticals. Presently the kernels of the seeds are used in restaurants/hotels as source of flavor and thickeners in vegetable preparation (Mahla *et al.*, 2014). Watermelon seed contains crude protein and oil besides minerals in appreciable quantity (Ibeanu *et al.*, 2012; Samia *et al.*, 2012). Its seed oil contains 80% unsaturated fatty acids with linoleic acid (18:2) being the dominant fatty acid (Jarret and Levi, 2012).

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Though highly adapted to desert conditions having livelihood supportive role in Indian Thar Desert, limited research attention has been paid for its seed yield improvement. The concept of seed purpose watermelon has been recognized in Indian Thar Desert (Mahla and Choudhary, 2013). Subsequently, breeding efforts were initiated for genetic improvement of watermelon for high seed yield suited to rainfed conditions of Indian hot arid zone.

Materials and Methods

After preliminary evaluation and characterization of 122 germplasm accessions of seed purpose watermelon including exotic and landraces during 2010, 41 selected genotypes were further evaluated under rainfed conditions at Central Arid Zone Research Institute, Regional Research Station, Jaisalmer during 2011 to 2013. The sowing was done after first good monsoon rain on 16th July, 13th August and 13th July during 2011, 2012 and 2013, respectively. The total rainfall during crop growing season was 219.2 mm (11 rainy days), 135.6 mm (6 rainy days) and 202.4 mm (4 rainy days) during 2011, 2012 and 2013, respectively. The experiments were conducted in randomized block design with two replications. The rows were spaced at 3.0 m apart while plant to plant spacing was maintained at 1.0 m. The observations