

Prevalent Moisture Stress in Climate Change Situation as a Selection Strategy for Drought Tolerance in Groundnut (*Arachis hypogaea* L.)

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Main Agriculture Research Station (MARS), University of Agricultural Sciences, Dharwad, India (15° 13' N, 75° 07' E, 678 m above mean sea level) receives 800 mm of average annual rainfall and thus comes under transitional tract of Karnataka state of India. This location has typical bimodal distribution of rainfall with one peak during July month that coincides with sowing and other during October month of the year that enables harvesting of groundnut. The soil type is medium deep black soil. Under the changing climatic scenario, this location also witnessed irregular rainfall during rainy season of 2015 with June month receiving 160 mm rainfall as against 64 year average of 104 mm which enabled sowing of groundnut breeding material (developed specifically for drought tolerance) during second fortnight of June. Then the location received 43, 34 and 22mm during July, August and September as against 64 years average of 155, 102 and 108 mm during the corresponding months. Hence, moisture stress during the post flowering to pod formation stage lead to wilting in the drought susceptible segregating material while, retention of green leaves in the drought tolerant 37 and 24 plants in the F₂ segregating material of the cross ICGV07211 X ICGV 2381 and R 2001-2 x GM 4-3, respectively. Among these high yielding five plants each from both the crosses were studied during summer 2016 with irrigated and limited irrigation conditions to study their response. Among these 10 plant to progenies evaluated, the best progeny R-2001-2 x GM-4-3-1 from R 2001-2 x GM 4-3 and ICGV-07211 x ICGV-2381-17 from ICGV 07211 x ICGV 2381 recorded higher pod yield (4858 and 5013 kg/ha, respectively) compared to 2716 kg/ha of high yielding check cultivar G 2-52 under irrigated condition. These progenies also recorded moderate pod yield of 3996 and 3704 kg/ha, respectively compared to 1862 kg/ha of check cultivar G 2-52 under limited irrigation. These genotypes designated as Dh 256 and Dh 257 were analyzed for their tolerance to drought in terms of relative water content during drought situation of rainy season of 2017. These genotypes had higher relative water content (> 70 %) as against 50 % relative water content in case of susceptible checks. These drought tolerant genotypes were entered in All India evaluation been advanced from initial two years of testing that may be released for cultivation under drought prone regions of India. Besides, these genotypes could serve as potential donors for drought tolerance breeding after ascertaining the components of drought tolerance in these genotypes.