IDT6-045 | Drought tolerance of sunflower genotypes with contrasting root traits

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Sunflower is grown in India in all seasons. But in the *kharif* season, it is subjected to intermittent stress and in *rabi* to end-season stress. Though many traits have been reported to be contributing to drought tolerance, root traits are of particular importance as they mine water from soil and aid in avoiding drought. Contrasting genotypes with high and poor root growth were selected, based on a composite index computed considering root and shoot traits simultaneously. High root genotypes recorded per plant mean root length, root volume and root dry weight of 120 cm, 129 cc, 20.5 g as against 65 cm, 35 cc and 5.3 g in poor root types. Fifteen high root and three poor root genotypes were evaluated in field during summer season for two years (2013 and 2014) by growing them in a strip plot with three replications. Stress was imposed at the most sensitive stage *i.e.* flowering, by withholding irrigation. The results indicated that drought affected leaf area and dry matter production significantly. However, the number of days to flowering and leaf number were the least affected. The per plant seed weight in poor root types was only 50% of that of high root types, both in control and stress though percent reduction due to stress was similar in both types. Based on drought susceptibility index and seed weight per plant in stress, genotypes SCG 49, SCG 64 and GP9-515-7-3-1 were identified as drought tolerant.

IDT6-046 | Traits that confer post-flowering drought tolerance in short duration pigeonpea

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Pigeonpea (*Cajanus cajan*) is one of the most important legume crop, ranking fifth in importance among edible legumes globally. It is adversely affected by intermittent and terminal droughts. As grain yield under drought is heavily influenced by genotype × environment interactions, a trait-based selection had been considered more beneficial in drought tolerance breeding. The objective of this study is to identify putative traits that confer yield advantages under post-flowering drought stress. Fifteen super early and early genotypes including breeding and germplasm lines, as a subset of greater number of test genotypes were field evaluated for pre and post-harvest physiological and agronomical traits. Significant variation was observed, among the genotypes, for the traits normalized difference vegetation index (NDVI) and SPAD chlorophyll meter reading, measured at different days after sowing at the reproductive phase, shoot biomass productivity, and yield components. Genotype × drought treatment interactions were found to be meager, especially in super early lines. Grain yield under drought was closely associated with NDVI measured at podfilling stage (r=0.86***), shoot biomass at maturity, harvest index (HI) and yield components. Though the genotypic variation in SPAD chlorophyll reading was large, its correlation with grain yield under drought was not significant. NDVI, a high throughput measure, was found to be significantly correlated with the other putative traits such as shoot biomass (r=0.91***), HI, pod number m-2 and seed number m-2 and therefore, can be used as a proxy in identifying better drought tolerant lines in crop improvement for early and super early pigeonpea.