B-183

Nodes and root system architecture traits propensity for improvement of moisture deficit stress tolerance in soybean (*Glycine max L Meril.*)

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Moisture deficit stress is a major impediment to sustainable soybean production under changing climate scenario. Breeding for moisture deficit stress tolerance is a genetic strategy to revamp resilient soybean cultivation. A breeding program for development of tolerant lines with high grain yield was initiated. Segregating populations were screened in summer season for such tolerance and selected lines were evaluated for high yield in rainy season. This cycle was followed three times and resulted in identification of 26 elite breeding lines. These 26 lines along with 4 checks were evaluated under rainout shelter water stress scenario for above ground traits and in lysimeters for root system architecture. Root traits were analyzed through Regent's WinRHIZO Arabidopsis root scanner. Distinct phenotypic variations were revealed among observed traits in terms of coefficient of variation, which ranged from 42.2% for root length density (RLD) to 9.9% for rooting depth. Among RAS traits, three traits *viz.* rooting depth, RLD and root surface area expressed positive correlations with root dry weight. Whereas, RLD had negative correlation with average root diameter ($r= -0.588$, $p<0.01$). Number of nodes.plant^{-1} expressed positive association with plant height. The below ground trait, average root diameter had positive correlations with the above ground traits *viz.* number of nodes.plant^{-1} and plant height. Drought resistance index exhibited positive correlations at whole plant level with average root diameter ($r=0.375$, $p<0.05$), number of nodes.plant^{-1}($r=0.549$, $p<0.01$) and plant height ($r=0.637$, $p<0.01$). A positive correlation of average root diameter with DRI and negative with RLD, made this trait crucial in determining moisture stress tolerance in this set of breeding lines delimiting the average root diameter between 0.33mm and 0.45mm. These results indicate that a whole plant level breeding strategy has potential for sustaining soybean improvement under moisture stress scenario.