

**VARIETAL EVALUATION OF SELECTED
GROUNDNUT (*Arachis hypogaea* L.) CULTIVARS FOR
MOISTURE STRESS TOLERANCE**



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ABSTRACT

There is a need to utilize water efficiently and effectively because water availability is scarce in the dry zone of Sri Lanka. Groundnut is grown in the Batticaloa district to limited extent; the yield is highly susceptible to moisture stress especially during the 'Yala' Season. This experiment was conducted at the Agronomy farm of the Eastern University, Sri Lanka. Studies were made to evaluate moisture stress tolerance of selected groundnut cultivars; 'Lanka jumbo', 'Tissa' and 'Indi' when the stress was imposed during the flowering stage and to determine the most suitable groundnut cultivar which can resist drought and produce substantial yield. This experiment was laid out in the Randomized Complete Block Design with six treatments and four replications and the treatments were arranged in 3×2 factorial manner. Moisture stress was imposed for the selected groundnut cultivars for a period of ten days during the flowering stage. The control plants were watered once in two days to field capacity.

There were significant ($p < 0.05$) differences between treatments in the measured physiological and growth attributes. The highest amounts of chlorophylls (a 0.98 mgg^{-1} , b 0.79 mgg^{-1} and total chlorophyll 1.7 mgg^{-1}) contents were observed in 'Indi' groundnut cultivar and the lowest amounts (chlorophylls a 0.47 mgg^{-1} , b 0.36 mgg^{-1} and total chlorophyll 0.9 mgg^{-1}) were recorded in 'Tissa' groundnut cultivar. Moisture stress significantly ($p < 0.05$) reduced the Relative Water Contents (RWC) of all the tested groundnut cultivars. The highest RWC was noticed in 'Indi' cultivar where the lowest was obtained in 'Tissa'.

Moisture stress significantly ($p < 0.05$) reduced the Leaf Area Index (LAI) of all the tested cultivars. The highest LAI was observed in 'Indi' cultivar and the lowest was found in 'Tissa'. There were significant ($p < 0.05$) differences between treatments in the

100 seed weight, shelling percentage and yield of selected groundnut cultivars. The highest 100 seed weight (24.6 g) was obtained in 'Indi' cultivar and the lowest (7.2 g) was found in 'Tissa' groundnut cultivar. 'Lanka Jumbo' showed the highest shelling percentage (62.4%) and the lowest (38.6%) was found in 'Tissa'. Moisture stress significantly ($p < 0.05$) reduced the yield of all the tested groundnut cultivars. The highest yield ($0.8 \text{ tonnesha}^{-1}$) was obtained in 'Indi' groundnut cultivar and the lowest (0.3 t ha^{-1}) was found in 'Tissa'.

There were also significant ($p < 0.05$) interaction between cultivars and moisture stress treatments in the 'chlorophyll a', total chlorophyll, RWC, shelling percentage, 100 seed weight and yield of the tested cultivars. However, no significant ($p > 0.05$) interaction was observed in the plant dry weight, number of pods per plant and 'chlorophyll b' content.

The highest yield obtained in 'Indi' groundnut cultivar under moisture stress condition would have been due to its inherent characteristic feature. Hence, considering the measured physiological and growth attributes, 'Indi' groundnut cultivar can resist drought better than the rest of the cultivars and could be suggested for cultivation in the drought prone soils of the Batticaloa district.

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