

Physiological and Growth Attributes of Selected Groundnut (*Arachis hypogaea* L.) Cultivars as Affected by Moisture Stress During the Flowering Stage

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Abstract

Water scarcity is one of the main constraints of agriculture sector development in dry zone of Sri Lanka. Therefore, identifying water efficient crops for dry zone agriculture is timely important. Groundnut is grown in the Batticaloa district to a limited extent where the yield is highly affected by moisture stress especially during 'Yala' Season. The experiment was carried out to evaluate the impact of moisture stress on yield of three groundnut cultivars (Lanka jumbo, Tissa and Indi) at agronomy farm of the Eastern University, Sri Lanka during 'Yala' 2017. The stress conditions were imposed during the flowering stage. Polyethylene bags (45cm diameter and 42cm height) filled with top soil, red soil and compost 1:1:1 potting mixture was used to grow plants. This experiment was set up according to randomized complete block design with four replications and the treatments were arranged in 3 × 2 factor factorial manner. Moisture stress was imposed for the selected groundnut cultivars for a period of ten days during the flowering stage. The control plants received water once in two days up to field capacity. Measured physiological and growth attributes under moisture stressed condition were significantly ($p < 0.05$) different between treatments but there were no significant ($p > 0.05$) interaction between stress factor and cultivar. The highest relative water content (71.6 %) was obtained in Indi while the lowest (52.2 %) was found in Tissa. The highest chlorophyll a (0.98 mg g^{-1}) and chlorophyll b (0.79 mg g^{-1}) were recorded in Indi and the lowest (0.47 mg g^{-1} and 0.36 mg g^{-1}) was found in Tissa. Cultivar Indi recorded the highest plant dry weight (127.8 g) while Tissa recorded the lowest (90.9g) under moisture stressed condition. The highest yield (0.8 t ha^{-1}) was obtained in Indi and the lowest (0.3 t ha^{-1}) was found in Tissa. According to the results, it can be concluded that cultivar Indi performed more efficiently under moisture stress conditions compared to other cultivars hence, could be used in drought prone areas of Batticaloa district.

Keywords: Chlorophyll contents, Groundnut, Moisture stress, Plant dry weight, Relative water content

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