B-06 Effect of leaf nitrogen and soil moisture on photosynthesis of young clonal tea

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An investigation was carried out to study: (a) Effect of soil moisture and Soil nitrogen levels on physiological parameters such as transpiration, photosynthesis, leaf stomatal conductance and water use efficiency of tea. (b) Light response curve on photosynthesis of one year old nursery TRI 2025 clonal tea.This study was undertaken at Tea Research Institute, Talawakelle.

In this study, 2 soil moisture levels (wet-near field capacity and dry-near permanent wilting point) and 3 leaf nitrogen levels (2 in the deficient range <3% and one in the optimum range 3-5%) were included. Physiological parameters such as photosynthesis and leaf stomatal conductance were measured with Infra Red Gas Analyzer (Li 6200). Transpiration was measured by the weighing lysimeter technique. Water use efficiency was calculated from photosynthesis and transpiration measurements. For light response curve, the total radiation on leaf surface was measured with a silicon cell pyrenometer.

Light levels on the leaf surface was changed with different layers of 'saran' material at constant temperature and relative humidity.

The results reveal that, photosynthesis, transpiration and leaf stomatal conductance were higher in the wet treatment. However, water use efficiency was higher in the dry treatment. Among the leaf nitrogen levels, plants in the optimum range showed significantly higher photosynthesis, transpiration and leaf stomata conductance compared to deficient levels. Water use efficiency was high at optimum leaf nitrogen level in both dry and wet treatments at 0700-0800 h and at a light intensity of 500-1000 μ mole of photon $m^{-2}S^{-1}$.

Light saturation point for TRI 2025 clone was found to be near 400 ìmole of photon $m^{-2}S^{-1}$ for all 3 nitrogen levels tested. However, light use efficiency and maximum photosynthetic rate increased with increasing nitrogen levels.