

## **EFFECT OF POTASSIUM ON DROUGHT STRESS MITIGATION IN TEA**

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Climate change related weather aberration and resultant extreme weather events are becoming increasingly common, affecting the crop production in Sri Lanka. As drought influences on crop production by altering the plant physiological functions, drought mitigation strategy with foliar application of  $K_2SO_4$  was tested for tea (*Camellia Sinensis* (L.) O. Kuntze). A glass house experiment with simulated drought condition was conducted at Tea Research Institute, Thalawakelle withholding water application for two contrasting tea cultivars, TRI 2025 (drought tolerant) and TRI 2023 (drought susceptible). The experiment was carried out as a Randomized Complete Block Design, with three treatments; T1-foliar application of 2%  $K_2SO_4$ , T2-water spray and T3-no spray and three replicates per each treatment. Physiological and biochemical status of tea plants exposed to drought stress and their responses for applied treatments were assessed with the parameters such as leaf photosynthesis, water use efficiency, stomatal conductance, transpiration and proline content. Results indicated that drought stress increases the leaf proline content in both cultivars while it showed differential responses for photosynthesis related parameters such as stomatal conductance. Although, foliar application of  $K_2SO_4$  did not show any significant ( $p > 0.05$ ) impact on physiological and biochemical parameters, the reduction of leaf photosynthesis rate, transpiration and proline content of TRI 2025 was higher than that of TRI 2023, exhibiting the drought tolerant ability of TRI 2025. As a drought stress mitigation mechanism due to the application of  $K_2SO_4$ , Leaf proline content showed the highest reduction among measured parameters in both cultivars. The exact mechanism of stomatal regulation in response to foliar application of  $K_2SO_4$  during drought need to be further explored. In-depth investigations on the effects of application of  $K_2SO_4$  for the drought mitigation in tea at different concentrations for different cultivars at different growth stages and locations are suggested.

**Keywords:** Drought mitigation, Photosynthesis, Potassium, Proline content, Tea