

## **BIOCHAR APPLICATION ON SOIL IMPROVEMENT AND EARLY GROWTH OF TEA**

**W. M. B. K. Walisundara<sup>1</sup>, N. P. S. N. Bandara<sup>2</sup> and W. M. R. S. K. Warnasooriya<sup>1</sup>**

*<sup>1</sup>Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura*

*<sup>2</sup>Agronomy Division, Tea Research Institute of Sri Lanka, Low Country Station, Ratnapura*

Drought mitigation strategies are vital in crop production particularly for tea (*Camellia Sinensis* (L). O. Kuntze). Present study evaluated biochar produced by pyrolyzing of locally available refused tea (TR) and paddy husk (PH) for its drought mitigation ability based on improvement of soil properties at early growth of tea. A pot experiment under glass house conditions was conducted for TRI 4049 cultivar at the Tea Research Institute, Ratnapura. Five treatments: 1:2 TR biochar:soil (T1), 1:2 PH biochar:soil (T2), 1:4 TR biochar:soil (T3), 1:4 PH biochar:soil (T4), control (T5) with eight replicates per each was arranged as Complete Randomize Design. Soil moisture content, soil chemical properties and plant growth parameters were evaluated. Although, initial soil pH of T1 (6.24) and T3 (6.00) exceeds the desirable pH range of tea (4.5 - 5.5), measurement at three months showed it in the desirable range. CEC (9.52 meq/g) and EC (1.19 ds/m) values were significantly high ( $p < 0.05$ ) in T1 while T5 recorded the lowest. Although, water holding capacity (WHC) was not significant ( $p > 0.05$ ), field capacity and permanent wilting point were significantly ( $p < 0.05$ ) different among the treatments. Plant death observed at six weeks after establishment in T1 and T3 may be due to inappropriate pyrolyzing conditions of RT biochar. Except for shoot fresh weight and shoot dry weight, other plant growth parameters were not significantly ( $p > 0.05$ ) different among treatments. However, compared to control, T2 and T4 recorded high values for plant height, stem girth and number of leaves per plant whereas low values were recorded in T1 and T3 for the same parameters. Soils amended with PH biochar recorded higher values for root length, root fresh weight, root dry weight, shoot fresh weight, shoot dry weight and shoot: root ratio than control. In conclusion, incorporation of paddy husk biochar is suitable for soil improvement and enhancement of early growth of tea. Further, research on optimizing the pyrolyzing conditions and field trials with biochar amendments is suggested to confirm the results.

**Keywords:** Biochar, Paddy husk, Refuse tea, Soil moisture