

Investigating the Water Usage of Oil Palm (*Elaeis guineensis*) and Rubber (*Hevea brasiliensis*) Trees in the Low Country Wet Zone of Sri Lanka

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The cultivation of oil palm (*Elaeis guineensis*) in Sri Lanka has been criticized for its higher water consumption and drying out of the landscape, depletion of soil properties, and loss of biodiversity. The government banned the cultivation of oil palm in 2021 due to public pressure without proper scientific investigation. Thus, this experiment was conducted to compare the crop water usage of 10-12 years old oil palm and rubber (*Hevea brasiliensis*) plantations at Nakiyadeniya and Sapumalkanda Estates in the Low Country Wet Zone of Sri Lanka. The Implexx Sap Flow Sensors (ISFS) that employs the heat pulse technique to assess sap flow and plant water relations of perennial plants were established in 3 leaf bases (from the top, middle and lower leaf layers of the canopy) of oil palm and in stem around 1.6 m height from tree-base of rubber plants in the same location. The water usage was recorded continuously for one week period simultaneously in both oil palm and rubber trees during October – November 2022 in both estates. The daily water usages of the oil palm and rubber trees in Nakiyadeniya Estate were 239.49 L/day and 42.17 L/day, respectively, while in Sapumalkanda Estate it was 277.94 L/day and 53.07 L/day, respectively. Though the daily water usage of a single oil palm and a rubber tree was significantly different ($p < 0.05$), the water usage per unit land area for oil palm ranged from 31,070-36,000 L/ha/day while that for rubber ranged from 22,000 – 27,825 L/ha/day. At the time of measurements, the canopy of the rubber plants had not reached the fully mature state after re-foliation and were also infested with PESTA leaf disease. Therefore, the water usage values obtained for rubber may be an underestimation which need to be repeated before any generalization is made.

Keywords: Crop water usage, Implexx Sap Flow Sensor, Oil palm, Sap flow thermometric sensor

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