B-107: Water-use efficiency and discrimination of ^{13}C among the coconut cultivars

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Discrimination of stable carbon isotopes in leaves is physiologically linked to water-use efficiency of plants. Cultivars selected from 5 locations (Moorock, Palugaswewa, Pitiyakanda, Clovis, and Namalwatte Estate) and now grown in a multi-locational cultivar evaluation trial at Poththukulama Estate, Pallama, were used for stable carbon isotope discrimination analysis. In situ measurements of net photosynthesis (A), intercellular and ambient partial pressure of CO_2 (P_i and P_a) were determined with a LiCOR-6500 photosynthesis system. Leaf samples were collected from the leaves used for net photosynthesis measurements and were analysed by means of a mass spectrometer for stable carbon isotope discrimination (Δ). Among the cultivars, Δ ranged from 15 to 19 %. Overall variation ($1-P_i/P_a$) among the cultivars was found to be 30%. The results suggest that even under variable field conditions, analysis of foliar Δ is a potential tool to identify coconut cultivars for high water use efficiency.

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