



## Assessment of *Melia dubia* plant traits useful for field evaluation under semi-arid environment

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### Abstract

Identifying plant traits that are critical in carbon assimilation under field conditions will reflect the performance and hence could be useful tool for assessing field performance under semiarid conditions. This hypothesis was tested using forty-two *Melia dubia* germplasm lines grown for four years under rainfed conditions. Cumulative increment in girth over years (CAI) and within a year (MAI) was the indication of growth which varied from 2.67 to 9.25 cm year<sup>-1</sup> and 1.09 to 0.17 cm month<sup>-1</sup>, respectively across forty-two germplasm lines, suggesting wide variations in growth and growth rates. Eight established plant traits that regulate photosynthesis process under moisture stress conditions were evaluated. Four out of eight traits studied emerged as most critical plant traits. They were leaf area, leaf area index, specific leaf area and cumulative carbon assimilation rate ( $\Delta^{13}\text{C}$ ). Strong positive linear relationships and percent contribution of these traits with growth suggested the usefulness of these traits in field evaluations of *Melia dubia* plant since these traits could easily be monitored at any stage of tree growth.

**Keywords:** Increment, *Melia dubia*, Moisture stress, Photosynthesis, Plant traits, Semi-arid