

Physio-agronomic performance of kenaf as influenced by different carbon levels

ABSTRACT

Soil carbon levels can have a significant impact on growth, biomass production, chlorophyll content, photosynthesis rate, fibre yield and carbon stock in kenaf. To determine the impact of different carbon levels on the physio-agronomic performance of kenaf, three kenaf varieties were grown on sandy soil in a field at Terengganu, Malaysia, in two growing seasons. Organic carbon at levels of 0, 10 and 20 t C ha⁻¹ was applied to the experimental plots. The experiment was arranged using four replicates in a randomized complete block design. Basal diameter, plant height, leaf number, leaf area, chlorophyll content and photosynthesis rate were measured as determinants of growth and biomass production. Plant roots, stems and leaves were separated and biomass content and fibre yield were determined at the time of harvest. The values for these parameters were highest at a carbon level of 20 t C ha⁻¹. Kenaf variety HC2 had the highest value for basal diameter, leaf number, leaf area, chlorophyll content, photosynthesis rate, fibre yield and carbon stock. We found a positive correlation between leaf area, photosynthesis rate and biomass production. Total biomass varied with carbon levels and among varieties, with the highest value at a carbon level of 20 t C ha⁻¹ for the variety HC2. The highest fibre yield and carbon stock values were also found in variety HC2 at the same carbon level. The results of this study could be used as a basis for growing kenaf in sandy soils under effective organic carbon management.

Keyword: Carbon levels; Chlorophyll content; Growth; *Hibiscus cannabinus*; Kenaf; Photosynthesis; Yield