

Assessment of Growth, Photosynthetic, and Biomass Characteristics in Selected Fodder Grass Varieties Under Varied Water Conditions

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Abstract

Fodder species play a crucial role in maintaining ecological balance and sustaining the cattle industry. However, water availability tends to impact fodder production. The objective of this research was to compare the growth and yield attributes of selected fodder varieties under varied water conditions. The experiment was conducted in semi-automated polytunnel facilities. Four fodder varieties (Factor 1) were utilized: CO3 (V1), CO4 (V2), Super Napier (V3), and *Brachiaria brizantha* (V4), with different water levels (Factor 2): 100% (25.0 l/day), 40% (10.0 l/day), and 25% (5.0 l/day) supplied throughout the growing season, each with thirty-six replicates. Each polytunnel was divided into four beds (12'x8') with four fodder species. Photosynthetic, growth, and yield data were analyzed. Results indicated that, among the fodder varieties, when supplemented with 40% water, CO3 exhibited the highest leaf length of 120cm, followed by CO4 (106.2cm), and Super Napier (76cm), respectively. Regarding photosynthetic traits, although not statistically significant, the 25% water-supplemented plots exhibited an increase in quantum yield efficiencies of photosynthesis (0.73) in CO4 grass, followed by Super Napier and CO3 (0.72). Similarly, stomatal conductance increased in CO3 (382 mmol mol), followed by Super Napier (372.0) and CO4 (300), while chlorophyll content was higher in the 100% water-treated plots in Super Napier fodder (47.7). The highest fresh and dry weights were produced in the 40% water-treated plots. Accordingly, Super Napier produced the highest (1756 g), followed by CO4 (1421g) and CO3 (906g) species, respectively. Overall, the 40% water supply (10 l/day) proved sufficient for producing increased biomass among the tested fodder grasses

Keywords: *Dry weight, Fodder varieties, Fresh weight, Water deficit*