

ABSTRACT

Cocoa (*Theobroma cacao* L.) is a high-value agricultural commodity that contributes significantly to farmers' income. One important factor in cocoa seedling production is the availability of sufficient and balanced nutrients. This study aimed to evaluate the effect of cow manure and NPK fertilizer on cocoa seedling growth. The experiment was conducted in Bangka Jaya Village, Dewantara Subdistrict, North Aceh, from March to June 2025, using a two-factor Randomized Block Design (RBD) with three replications. The first factor was cow manure (P), consisting of three levels: P0 = no fertilizer, P1 = 100 g/polybag, and P2 = 200 g/polybag. The second factor was NPK fertilizer (N), also with three levels: N0 = no fertilizer, N1 = 5 g/polybag, and N2 = 10 g/polybag. Observed variables included plant height, number of leaves, stem diameter, fresh weight, root length, root volume, chlorophyll content, and stomatal number. Results showed that cow manure significantly affected plant height, number of leaves, stem diameter, fresh shoot weight, chlorophyll content, and stomatal number. The best results were obtained with 100 g/polybag. Plant height was influenced at 60 and 75 DAS, leaf number at 30–60 DAS, stem diameter at 30, 60, and 75 DAS, fresh shoot weight, chlorophyll content at 75 DAS, and stomatal number. NPK fertilizer significantly affected chlorophyll content and stomatal number, with the highest values at 10 g/polybag. An interaction occurred between cow manure and NPK on chlorophyll content at 75 DAS. The optimal combination was 200 g/polybag cow manure with 5 g/polybag NPK, which gave the best overall growth performance.

Keyword: Substrate, Growth, Organic, Inorganic.