

ABSTRAK

Cacao (*Theobroma cacao* L.) is one of the plantation commodities that plays a vital role in boosting the economy and improving community well-being. The success of cacao seedling propagation is greatly influenced by the availability of nutrients and growing media conditions that support optimal seedling growth. The use of growing media enriched with organic matter, such as cattle manure and biochar, along with the application of NPK fertilizer, is expected to enhance the growth of cacao seedlings. This study aims to determine the effects of growing media composition and NPK fertilizer dosage, as well as their interactions, on the growth of cacao seedlings. The study was conducted at the Experimental Garden and Agroecotechnology Laboratory of the Faculty of Agriculture, Malikussaleh University, North Aceh Regency, from April to June 2026. A two-factor randomized block design (RBD) with three replications was used. The first factor was the composition of the growing medium, namely M0 (topsoil), M1 (topsoil + cow manure in a 1:1 ratio), and M2 (topsoil + biochar in a 1:1 ratio). The second factor was the NPK fertilizer dose, namely N0 (0 g/polybag), N1 (3 g/polybag), and N2 (6 g/polybag), resulting in 27 experimental units. The observed variables included plant height, number of leaves, stem diameter, chlorophyll content, root length, root volume, and number of stomata on lower leaves. The results showed that the growing medium composition affected plant height at 2, 4, and 8 MST, the number of leaves at 6 MST, stem diameter at 6 and 8 MST, and chlorophyll content. The topsoil + biochar (1:1) growing medium yielded the best results. The application of NPK fertilizer affected the number of leaves at 4 MST, stem diameter at 6, 8, and 10 MST, and chlorophyll content, with the optimal dose being 6 g/polybag. There was an interaction between growing medium composition and NPK fertilizer on the chlorophyll content of cocoa seedlings.

Keywords: Biochar, Leaf Chlorophyll, MCC 02, Vegetative Growth, Topsoil