

ABSTRACT

Tomato (*Lycopersicum esculentum* Mill) is a horticultural crop with a vital role in the food and industrial sectors. The decline in tomato production is often attributed to suboptimal cultivation techniques, particularly in fertilization. This study aimed to examine the effects of biochar and potassium chloride (PC) fertilizer, both individually and in combination, on the production and quality of tomato. The research was conducted in Tambon Tunong Village, Dewantara District, North Aceh, and the Laboratory of the Faculty of Agriculture, Universitas Malikussaleh, from January to April 2025. A two-factor Randomized Block Design (RBD) was used, with three levels of biochar dosage (0, 5, and 10 tons/ha) and three levels of potassium dosage (0, 100, and 200 kg/ha), comprising 27 experimental units with 3 replications. The observed parameters included plant height, stem diameter, chlorophyll content, number and morphology of stomata, flowering time, fruit number and weight per plant, yield per hectare, and fruit quality parameters such as diameter, length, total soluble solids (°Brix), and shelf life. The results showed that biochar or potassium applied individually did not significantly affect most production and quality parameters. However, a significant interaction effect was observed when biochar and potassium were applied together, particularly influencing the number of fruits per plant, fruit weight per plant, and total yield per hectare. These findings suggest a synergistic interaction between biochar and potassium in enhancing tomato productivity and quality, especially during the generative phase.

Keywords: Biochar, Potassium, Quality, Production, Tomato.