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The organic fertilisers effect on local chili katokkon as a climate change adaptation in Indonesia

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Abstract

The climate crisis is one of the major threats to food security in Indonesia. As most of agricultural lands is managed by smallholder farmers with low adaptive capacities, climate-related shocks cause low productivity or crop failures. Chili (*Capsicum* spp.) plays a key role in smallholder farmers' livelihoods being a daily food with high economic value. In Toraja, the local variety Katokkon chili is such a high market demand cash crop. One adaptation effort to restore farm productivity is improving soil quality and soil organic carbon through the application of biochar and compost. This study aims to determine the best combination of organic fertilisers using compost and biochar in Katokkon chili cultivation. A farmer-led field experiment was conducted during the 2024 growing season in Ullin Rembon village, a representative area for Katokkon chili production. Two Katokkon types (L1: Limbong; L2: Leatung) were tested across six compost-biochar treatment ratios: R0 (100 % compost), R1 (80 % compost, 20 % biochar), R² (60 % compost, 40 % biochar), R³ (40 % compost, 60 % biochar), R4 (20 % compost, 80 % biochar), and R5 (100 % biochar), using a split-plot design with four replications. In the vegetative phase, plant height and stem diameter were measured; in the generative phase, initial flowering time and number of productive branches were observed. At 70 Days After Planting (DAP), compost-biochar treatments had a significant effect on vegetative growth. The highest plant height was observed in the L1R² combination (18.87 cm), and the greatest stem diameter in L1R4 (4.49 cm). In the generative phase, treatment effects on flowering time and productive branches were not statistically significant. The best combination on the number of productive branches is L1R² with an average of 26.88. In addition, the improvement of soil quality from the application of compost and biochar was also seen with an increase in soil organic C value from 1.04 % to 1.17 % and an increase in potassium (K) nutrients from 0.19 cmol (+) kg⁻¹ to 0.21 cmol (+) kg⁻¹. It can be concluded that the Katokkon Limbong variety with 40 % or 80 % biochar mixed into compost is effective in enhancing vegetative growth in Katokkon chili plants.

Keywords: Adaptation, biochar, chili, climate crisis, compost, Indonesia, Katokkon, local variety, organic fertilisers, Toraja

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