

***Application of Mushroom Substrate Waste Compost with
NPK Inorganic Fertilizer on the Growth and Yield
of Edamame (Glycine max L.)***
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ABSTRACT

Excessive application of inorganic fertilizers can reduce soil quality, thereby decreasing the yield of edamame. One effort to overcome this problem is through the use of organic fertilizers such as mushroom substrate waste compost and the use of low doses of inorganic NPK fertilizers. The purpose of this study was to examine the application of mushroom substrate waste compost with inorganic NPK fertilizers on the growth and yield of edamame plants. This study was conducted for three months from July to October 2025 using the RBD method (randomized block design) with two factors, namely the dosage of mushroom substrate compost (control; 10 tons/ha; 20 tons/ha; and 30 tons/ha) and the dosage of NPK fertilizer (300 kg/ha; 250 kg/ha; and 200 kg/ha). The parameters observed included plant height, number of branches, number of leaves, number of pods per sample, fresh pod weight per sample, fresh pod weight per plot, fresh biomass weight, and number of root nodules. The results showed that a dose of 30 tons/ha of mushroom substrate compost produced the best results in terms of plant height (27.8 cm), number of branches (10.5 branches), number of leaves (13.6 leaves), number of pods (45.11 pods), pod weight per sample (99.5 grams), pod weight per plot (1853.4 grams), biomass (129.4 grams), and root nodules (24.1). At the NPK dosage, the 250 kg/ha dosage yielded significant results in plant height (33.5 cm), number of branches (8.94 branches), number of leaves (12.44 leaves), number of pods (40.4 pods), pod weight per sample (80.7 grams), biomass (117.2 grams), and root nodules (18.5). An interaction was also observed in the root nodule parameter. It can be concluded that the combination of mushroom substrate compost and NPK fertilizer can enhance the growth and yield of Edamame plants.

Keywords: sawdust compost, sustainable agriculture, synthetic fertilizer