Optimization of Humic Acid and Vermicompost on the Growth and Yield of Soybean (Glycine max* (L.) Merrill*).

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ABSTRACT

The national soybean productivity tends to decline each year due to land degradation as a result of excessive synthetic fertilizer use. Dependence on synthetic fertilizers can be reduced by applying humic acid and vermicompost. This study aims to examine the effect of humic acid and vermicompost on the growth and yield of soybean plants. The research was conducted from August to November 2024, at the Research Field of Jember State Polytechnic. The experiment was conducted using a Randomized Block Design (RAK) Factorial with two factors and three replications. The first factor is the dose of humic acid, which consists of 10 kg/ha, 20 kg/ha, 25 kg/ha, and 30 kg/ha, while the second factor is the dose of vermicompost, which consists of 15 tons/ha and 20 tons/ha. The research data were tested using ANOVA, and then the results were further tested using DMRT at the 5% or 1% level. The research results indicate that there is an interaction between the treatment of 25 kg/ha humic acid and 20 tons/ha vermicompost, which significantly affects the number of root nodules (7.17 units) and the number of productive branches (5.72 branches). Individually, the treatment of 10 kg/ha humic acid significantly affected the number of root nodules (6.83 units), while 20 kg/ha humic acid significantly affected the fresh pod weight per sample (2.02 g) and the fresh pod weight per plot (124.89 g). The treatment of vermicompost at 20 tons/ha significantly affected plant height (26.69 cm), while vermicompost at 15 tons/ha significantly affected the number of productive branches (5.55 branches). The results indicate that humic acid and vermicompost are suspected to play a role in improving soil fertility and increasing nutrient availability for soybean plants.

Keywords*: legumes, soil conditioners, worm fertilizer*