

The Effect of Cellulolytic Decomposer Application and Straw Mulch on the Growth and Yield of Edamame Plants

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ABSTRACT

Edamame production in Indonesia remains suboptimal due to declining soil fertility caused by the long-term application of inorganic fertilizers. The use of cellulolytic decomposers and rice straw mulch is an alternative approach to restore soil quality and increase crop productivity. This study aimed to analyze the effect of cellulolytic decomposer and straw mulch application on the growth and yield of edamame. The research was conducted from July to October 2025 in Krajan, Slawu Village, Jember Regency (Lat: -8.140997, Long: 113.697992) at an altitude of 146 m above sea level. The experiment used a factorial randomized block design with two factors and three replications. The first factor was cellulolytic decomposer concentration consisting of 0 ml.l⁻¹, 2 ml.l⁻¹, and 4 ml.l⁻¹. The second factor was straw mulch thickness consisting of 0 cm, 2 cm, and 4 cm. The results indicated that the single application of 2 cm straw mulch significantly affected several yield components, including the number of filled pods with 2 and 3 seeds (27.56 pods), total pods per sample (35.92 pods), pod weight per sample (86.53 g), and pod weight per plot (1,514.44 g). The mulch had a positive effect on crop production due to its function in maintaining soil moisture and suppressing weed growth. The impact of this is that the absorption of water and nutrient by plants becomes optimal. The interaction between the cellulolytic decomposer and straw mulch, as well as the single effect of the decomposer, showed no significant influence on the growth and yield of edamame.

Keywords: *cellulolytic bacteria, decomposer, edamame, straw mulch*