

***The Effect of Amino Acid-Based Biostimulants and Formulation NPK Fertilizer
on the Growth and Yield of Edamame (*Glycine max* (L.) Merrill)***

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ABSTRACT

*The decrease in the effectiveness of nutrient uptake in edamame plants (*Glycine max* (L.) Merrill) is influenced by suboptimal environmental conditions, resulting in less-than-optimal nutrient absorption. A study on the application of amino acid-based biostimulants to increase production for the export market was conducted. This research aims to analyze the effects of amino acid-based biostimulants and formulation NPK fertilizer application on edamame plant production. The research was conducted from September to December 2025 at the experimental field of Jember State Polytechnic. The research design used was a non-factorial Randomised Block Design (RBD) with 9 treatments, namely P1 100% NPK formulation (Phonska (NPK+S), Urea, Za, MgSO₄, MKP), P2 100% NPK formulation (Urea, Za, TSP, KCl), P3 100% NPK formulation (Phonska, MAP), P4 100% NPK formulation (Phonska, urea, Za, MgSO₄, MKP) + biostimulant 2x, P5 100% NPK formulation (urea, Za, TSP, KCl) + biostimulant 2x, P6 100% NPK formulation (Phonska, MAP) + biostimulant 2x, P7 50% NPK formulation (Phonska, urea, Za, MgSO₄, MKP) + biostimulant 4x, P8 50% NPK formulation (Urea, Za, TSP, KCl) + biostimulant 4x, P9 50% NPK formulation (Phonska, MAP) + biostimulant 4x, repeated three times, resulting in 27 experimental units. The variables observed included plant height, leaf greenness, number of productive nodes, crown-to-root ratio, total number of pods, number of filled pods, number of empty pods, number of pods containing 2 and 3 seeds, and total pod weight. The observational data were analysed using analysis of variance (ANOVA), and where significant effects were found, these were followed up with DMRT post-hoc tests at the 5% level. The results of the study showed that the best results were obtained in treatment P4 for the harvest root-to-shoot ratio, the number of filled pods with 2 and 3 seeds, total pod weight and treatment P9 in the ratio of root to shoot mass, empty pods, total pod weight.*

Keywords: *amino acids, biostimulants, edamame*