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Pengaruh Pupuk Nano dan Pupuk Hayati terhadap Pertumbuhan dan Kandungan Antosianin Padi Hitam (Oryza sativa L. 'Sembada Hitam')
Dewi Widiarti, Prof. Dr. Kumala Dewi, M.Sc.St.
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PENGARUH PUPUK NANO DAN PUPUK HAYATI TERHADAP PERTUMBUHAN DAN KANDUNGAN ANTOSIANIN PADI HITAM (*Oryza sativa* L. 'SEMBADA HITAM')

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INTISARI

Padi hitam (*Oryza sativa* L. 'Sembada Hitam') merupakan varietas lokal unggulan Sleman, Yogyakarta yang berpotensi dikembangkan sebagai pangan fungsional karena kandungan senyawa bioaktif dan nilai gizi yang tinggi. Optimalisasi pertumbuhan dan kualitas gizi padi hitam dipengaruhi oleh ketersediaan unsur hara, sehingga diperlukan strategi pemupukan yang efisien dan berkelanjutan. Penelitian ini bertujuan menganalisis pengaruh pupuk nano dan pupuk hayati terhadap pertumbuhan, parameter fisiologis, kualitas biji, dan hasil tanaman padi hitam. Penelitian ini menggunakan Rancangan Acak Lengkap (RAL) dengan 7 perlakuan dan masing-masing perlakuan dibuat 7 ulangan, yaitu kontrol (P0), NPK 100% (P1), NPK 50% (P2), NPK 50%+Nano (P3), NPK 50%+Hayati (P4), NPK 100%+Nano (P5), dan NPK 100%+Hayati (P6). Parameter yang diukur meliputi tinggi tanaman, jumlah anakan, kadar klorofil, karotenoid, kerapatan stomata, luas daun bendera, kadar antosianin, pati, Fe total, dan berat 100 gabah kering. Kadar klorofil, karotenoid, antosianin, dan pati diukur menggunakan spektrofotometer UV-Vis, sedangkan kadar Fe total dianalisis menggunakan *Atomic Absorption Spectrophotometry* (AAS). Data dianalisis menggunakan ANOVA taraf nyata 0,05 dan dilanjutkan dengan DMRT pada tingkat kepercayaan 95%. Hasil penelitian menunjukkan bahwa perlakuan pupuk NPK 100%+Hayati memberikan pengaruh nyata terhadap peningkatan tinggi tanaman, jumlah anakan, luas daun bendera, kadar klorofil, kadar antosianin, dan berat 100 gabah. Perlakuan kombinasi pupuk nano dan hayati tidak memberikan pengaruh nyata terhadap kadar karotenoid, pati, Fe total, dan kerapatan stomata.

KATA KUNCI: padi hitam, pupuk hayati, pupuk nano

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EFFECTS OF NANO FERTILIZER AND BIOFERTILIZER ON GROWTH AND ANTHOCYANIN CONTENT OF BLACK RICE (*Oryza sativa* L. 'SEMBADA HITAM')

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ABSTRACT

Black rice (*Oryza sativa* L. 'Sembada Hitam') is a superior local variety from Sleman, Yogyakarta, with considerable potential to be developed as a functional food due to its high bioactive compound content and nutritional value. The optimization of black rice growth and nutritional quality is influenced by nutrient availability, therefore, an efficient and sustainable fertilization strategy is required. This study aimed to analyze the effects of nano fertilizer and biofertilizer on the growth, physiological parameters, grains quality, and yield of black rice. The experiment was arranged using a Completely Randomized Design (CRD) with 7 treatment and each treatment with 7 replicates, consisting of control (P0), 100%-dose NPK (P1), 50% NPK (P2), 50% NPK+nano fertilizer (P3), 50% NPK+biofertilizer (P4), 100%-dose NPK+nano fertilizer (P5), and 100%-dose NPK+biofertilizer (P6). The observed parameters included plant height, number of tillers, chlorophyll content, carotenoid content, stomatal density, flag leaf area, anthocyanin content, starch content, total Fe content, and 100-grain dry weight. Chlorophyll, carotenoid, anthocyanin, and starch contents were measured using a UV-Vis spectrophotometer, while total Fe content was analyzed using Atomic Absorption Spectrophotometry (AAS). Data were analyzed using ANOVA at a 5% significance level followed by Duncan's Multiple Range Test (DMRT) at a 95% confidence level. The results showed that the 100%-dose NPK+biofertilizer treatment significantly increased plant height, number of tillers, flag leaf area, chlorophyll content, anthocyanin content, and 100-grain weight. In contrast, the combination of nano fertilizer and biofertilizer had no significant effect on carotenoid content, starch content, total Fe content, and stomatal density.

KEY WORDS: black rice, biofertilizer, nano fertilizer