

RINGKASAN

Peningkatan penggunaan pupuk kimia dalam pertanian menimbulkan dampak negatif terhadap tanah dan lingkungan sehingga diperlukan alternatif yang lebih ramah lingkungan yang berasal dari kotoran ternak (feses kambing). Pupuk organik dari feses kambing memiliki potensi karena mengandung unsur hara nitrogen, fosfor, dan kalium. Pembuatan pupuk organik khususnya dari feses kambing perlu dilakukan penambahan bioaktivator untuk mempercepat penguraian bahan organik dan meningkatkan ketersediaan unsur hara. Penelitian ini bertujuan mengetahui pengaruh dosis bioaktivator *Biofad* terhadap kualitas pupuk feses kambing serta menentukan dosis yang paling efektif dalam meningkatkan kandungan nitrogen, fosfor, dan kalium.

Metode yang digunakan adalah penelitian eksperimen dengan rancangan acak lengkap (RAL) terdiri atas empat perlakuan dan lima ulangan. Perlakuan dalam penelitian ini adalah P0 (tanpa bioaktivator), P1 (0,025%), P2 (0,050%), P3 (0,075%). Variabel yang diamati adalah kualitas pupuk seperti nitrogen, fosfor dan kalium. Proses pengomposan dilakukan selama 45 hari dengan penambahan molases dan air, serta pengadukan berkala. Sampel pupuk yang telah matang dikeringkan, dihaluskan, dan dianalisis di laboratorium. Kandungan nitrogen dianalisis dengan metode *Kjeldahl*, fosfor dengan *spektrofotometri*, dan kalium dengan *Atomic Absorption Spectroscopy (AAS)*. Data penelitian selanjutnya dianalisis menggunakan ANOVA dan dilanjutkan dengan uji DMRT dan uji ortogonal polynomial jika perlakuan menunjukkan pengaruh nyata terhadap variabel.

Hasil penelitian menunjukkan bahwa penambahan *Biofad* berpengaruh nyata terhadap kandungan nitrogen dan fosfor pada pupuk feses kambing. Kandungan nitrogen berkisar antara 2,07-2,46%. Peningkatan nitrogen terjadi karena mikroorganisme dalam *Biofad* mampu mempercepat proses dekomposisi bahan organik dan mineralisasi nitrogen. Kandungan fosfor berkisar antara 0,57-1,10%. Peningkatan kandungan fosfor disebabkan oleh aktivitas mikroorganisme yang menghasilkan asam organik sehingga membantu melarutkan fosfat terikat menjadi bentuk yang lebih tersedia. kalium berkisar antara 1,86-2,26% dan tidak menunjukkan perbedaan nyata antar perlakuan karena pelepasan kalium lebih dipengaruhi oleh kondisi lingkungan selama pengomposan dibandingkan aktivitas mikroorganisme. Kesimpulan penelitian ini menunjukkan bahwa dosis *Biofad* 0,025% dinilai efektif dalam meningkatkan kualitas pupuk feses kambing.

Kata kunci : Pupuk Organik, Feses Kambing, Bioaktivator *Biofad*, Kualitas Pupuk

SUMMARY

The increasing use of chemical fertilizers in agriculture has caused negative impacts on soil quality and the environment, thus encouraging the need for more environmentally friendly alternatives derived from livestock waste, such as goat manure (feces). Goat manure has potential as an organic fertilizer because it contains essential nutrients, including nitrogen (N), phosphorus (P), and potassium (K). The production of organic fertilizer from goat manure requires the addition of a bioactivator to accelerate organic matter decomposition and improve nutrient availability. This study aimed to determine the effect of Biofad bioactivator dosage on the quality of goat manure compost and to identify the most effective dosage for increasing nitrogen, phosphorus, and potassium content.

The study used an experimental method with a completely randomized design (CRD) consisting of four treatments and five replications. The treatments were P0 (without bioactivator), P1 (0.025%), P2 (0.050%), and P3 (0.075%). The observed variables were fertilizer quality parameters, namely nitrogen, phosphorus, and potassium content. The composting process was carried out for 45 days with the addition of molasses and water, as well as periodic turning. The matured compost samples were then dried, ground, and analyzed in the laboratory. Nitrogen content was analyzed using the Kjeldahl method, phosphorus using spectrophotometry, and potassium using Atomic Absorption Spectroscopy (AAS). The data were analyzed using ANOVA followed by DMRT and polynomial orthogonal tests when significant differences occurred among treatments.

The results showed that the addition of Biofad had a significant effect on nitrogen and phosphorus content in goat manure fertilizer. Nitrogen content ranged from 2.07–2.46%. The increase in nitrogen content occurred due to the microorganisms in Biofad that accelerated the decomposition of organic matter and nitrogen mineralization processes. Phosphorus content ranged from 0.57–1.10%. The increase in phosphorus content was caused by microbial activity producing organic acids that helped solubilize bound phosphate into a more available form. Potassium content ranged from 1.86–2.26% and did not show significant differences among treatments because potassium release was more influenced by environmental conditions during the composting process than by microbial activity. The conclusion of this study showed that a Biofad dose of 0.025% was considered effective in improving the quality of goat manure fertilizer.

Keywords: Organic fertilizer, goat manure, Biofad bioactivator, fertilizer quality.