

RINGKASAN

Produksi semangka di Indonesia pada tahun 2021, 2022, dan 2023 mengalami fluktuasi dan belum memenuhi permintaan pasar global sebesar 1.506.000 ton per tahun. Hal ini terjadi karena kondisi kualitas tanah yang tidak mendukung pertumbuhan tanaman dengan optimal akibat penggunaan pupuk sintetis secara berkala. Pupuk sintetis dalam jangka panjang dapat mengakibatkan pencemaran air, pencemaran tanah, penurunan tingkat kesuburan tanah, serta dapat mengganggu kesehatan manusia. Upaya untuk mencegah permasalahan tersebut yaitu menggunakan pupuk organik. Kotoran sapi dan kambing dapat diolah menjadi pupuk organik melalui pengomposan dengan bantuan fermentor seperti *Effective Microorganism 4* (EM4), *eco-enzyme*, dan Bio Decolizea. Penelitian ini bertujuan untuk 1) mengetahui kualitas kompos kotoran sapi dan kambing menggunakan fermentor alami (*eco-enzyme* dan Bio Decolizea) dan fermentor komersial (EM4), 2) mengetahui pengaruh pemberian kompos kotoran sapi dan kambing menggunakan fermentor alami, serta kombinasinya dengan pupuk N,P,K dosis rendah terhadap bobot buah semangka.

Penelitian dilaksanakan di Kelurahan Bobosan, Kecamatan Purwokerto Utara, Kabupaten Banyumas. Penelitian dilaksanakan pada bulan Agustus 2024 hingga Februari 2025. Metode yang digunakan pada tahap pembuatan kompos menggunakan Rancangan Acak Kelompok (RAK) yang terdiri atas dua faktor kombinasi perlakuan. Faktor pertama yaitu kotoran ternak (K). K₁=Kotoran sapi dan K₂=Kotoran Kambing. Faktor kedua yaitu pemberian fermentor (F). F₁=Fermentor EM4, F₂=Fermentor *eco-enzyme*, F₃=Bio Decolizea. Penelitian dikombinasikan dan didapatkan 6 kombinasi perlakuan dengan 3 ulangan sehingga secara keseluruhan terdapat 18 unit percobaan. Metode yang akan digunakan pada tahap budidaya semangka yaitu Rancangan Acak Kelompok (RAK) yang terdiri atas dua faktor kombinasi perlakuan. Faktor pertama yaitu perlakuan pupuk N,P,K (A). A₀=N, P, K 0% rekomendasi, A₁=N, P, K 50% rekomendasi, A₂=N, P, K 100% rekomendasi. Faktor kedua yaitu jenis kompos (P), P₁= Pupuk kotoran sapi dengan fermentor *eco-enzyme*, P₂=Pupuk kotoran kambing dengan fermentor *eco enzyme*, P₃= Pupuk kotoran sapi dengan fermentor Bio Decolizea, P₄= Pupuk kotoran kambing dengan fermentor Bio Decolizea. Penelitian dikombinasikan dan didapatkan 12 kombinasi perlakuan dengan 3 ulangan sehingga terdapat 36 unit percobaan. Data penelitian dianalisis dengan analisis ragam pada taraf kepercayaan 95% dan apabila berbeda nyata dilanjutkan dengan Uji Berganda *Duncan's* (*Duncan's Multiple Range Test/DMRT*) dengan taraf kepercayaan 95%. Variabel pengamatan yang diamati yaitu suhu pengomposan, kadar air kompos, penurunan bobot kompos, partikel kompos, kadar N, kadar P, kadar K, C/N rasio, pH, C-organik, kandungan Pb, kandungan Cd, umur berbuah, umur berbunga, diameter buah, dan berat buah per tanaman.

Hasil penelitian menunjukkan bahwa semua variabel kompos kotoran sapi dan kambing telah memenuhi Standar Nasional Indonesia dalam Peraturan Menteri No. 01. Tahun 2019 kecuali pada variabel kadar air dan C/N rasio kompos kotoran sapi dan kambing menggunakan fermentor Bio Decolizea. Kompos kotoran sapi

dan kambing menggunakan fermentor alami (*eco-enzyme*) setara dengan kompos kotoran sapi dan kambing menggunakan fermentor komersial (EM4). Pemberian pupuk N,P,K 0% rekomendasi mampu mempercepat umur berbunga sebesar 10,17% dan 11,29% dibandingkan dengan pemberian pupuk N,P,K 50% rekomendasi dan 100% rekomendasi. Pemberian pupuk N,P,K 0% rekomendasi mampu mempercepat umur berbuah sebesar 9,96% dan 10,42% dibandingkan dengan pemberian pupuk N,P,K 50% rekomendasi dan 100% rekomendasi. Pemberian pupuk N,P,K 50% rekomendasi dan 100% rekomendasi memberikan hasil yang setara terhadap bobot buah per tanaman semangka dengan rerata bobot buah per tanaman yaitu 502,95 g. Sementara itu, jenis kompos belum mampu meningkatkan bobot buah semangka.



SUMMARY

Watermelon production in Indonesia in 2021, 2022, and 2023 fluctuated and did not meet global market demand of 1,506,000 tons per year. This is because the soil quality conditions do not support optimal plant growth due to the periodic use of synthetic fertilizers. Synthetic fertilizers in the long term can cause water pollution, soil pollution, decreased soil fertility, and can interfere with human health. Efforts to prevent these problems include using organic fertilizers. Cow and goat manure can be processed into organic fertilizer through composting with the help of fermentors such as Effective Microorganism 4 (EM4), eco-enzyme, and Bio Decolizea. The research aims to 1) determine the quality of cow and goat manure compost using natural fermentors (eco-enzyme and Bio Decolizea) and commercial fermentors (EM4), 2) determine the effect of applying cow and goat manure compost using a natural fermentor, as well as its combination with N, P, K fertilizer low dose on watermelon wight.

The research was conducted in Bobosan Village, North Purwokerto District, Banyumas Regency. The research was conducted from August 2024 to February 2025. The method used in the composting stage used a Randomized Block Design (RBD) consisting of two treatment combination factors. The first factor is livestock manure (K). K_1 = Cow dung and K_2 = Goat dung. The second factor is the provision of a fermentor (F). F_1 =EM4 fermentor (15 mL EM4 + 15 mL molasses + 750 mL water/unit. F_2 =Eco-enzyme fermentor 150 mL/unit. F_3 =Bio Decolizea 150 mL/unit. The research was combined and obtained 6 treatment combinations with 3 replications so that there were 18 experimental units in total. The method that will be used in the watermelon cultivation stage is the Randomized Block Design (RBD) consisting of two treatment combination factors. The first factor is the N, P, K fertilizer treatment (A). A_0 =N, P, K 0% recommendation. A_1 =N, P, K 50% recommendation. A_2 =N, P, K 100% recommendation. The second factor is the type of fertilizer (P). P_1 =Cow manure fertilizer with eco-enzyme fermentor. P_2 =Goat manure fertilizer with eco enzyme fermentor. P_3 =Cow manure fertilizer with Bio Decolizea fermentor. P_4 =Goat manure fertilizer with fermentor Bio Decolizea. The research was combined and obtained 12 treatment combinations with 3 replications so that there were 36 experimental units. The research data was analyzed using analysis of variance at a 95% confidence level and if significantly different, continued with Duncan's Multiple Range Test (DMRT) with a 95% confidence level. The observed variables were composting temperature, compost moisture content, compost weight loss, compost particle size, N content, P content, K content, C/N ratio, pH, C-organic content, Pb content, Cd content, fruiting age, flowering age, fruit diameter, and fruit weight per plant.

The results of the study showed that all variables of cow and goat manure compost had met the Indonesian National Standards in Ministerial Regulation No. 01. 2019 except for the variables of water content and C/N ratio of cow and goat manure compost using Bio Decolizea fermentor. Cow and goat manure compost using natural fermentor (eco-enzyme) is equivalent to cow and goat manure compost using commercial fermentor (EM4). Application of 0% recommended N,

P, K fertilizer can accelerate flowering age by 10.17% and 11.29% compared to application of 50% recommended and 100% recommended N, P, K fertilizer. Application of 0% recommended N, P, K fertilizer can accelerate fruiting age by 9.96% and 10.42% compared to application of 50% recommended and 100% recommended N, P, K fertilizer. Application of 50% recommended and 100% recommended N, P, K fertilizer provides equivalent results to fruit weight per watermelon plant with an average fruit weight per plant of 502.95 g. Meanwhile, this type of compost has not been able to increase the weight of watermelon fruit.

