

RINGKASAN

Pupuk organik hayati (POH) diperkaya agensia hayati. POH merupakan salah satu teknologi dalam budidaya tanaman pertanian. POH diaplikasikan untuk meningkatkan kualitas dan kuantitas hasil tanaman pertanian. Laboratorium Tanah Universitas Jenderal Soedirman memproduksi MF (Mikroba Fosfat). Laboratorium Perlindungan Tanaman memproduksi Bio P60 (*Pseudomonas fluorescens* P60) sebagai agensia hayati untuk tanaman. MF dan Bio P60 ini kemudian diaplikasikan pada budidaya tanaman kentang di Desa Pekasiran, Kecamatan Batur, Kabupaten Banjarnegara serta diaplikasikan pada budidaya tanaman jagung di *Experimental Farming*, Fakultas Pertanian, Universitas Jenderal Soedirman. Aplikasi agensia hayati tersebut dipadukan dengan penggunaan pupuk sintesis sesuai dosis dan pupuk organik hayati yang digranul terlebih dahulu. Paduan teknologi budidaya tersebut kemudian disebut dengan budidaya SOP UNSOED. Tujuan penelitian ini adalah mengetahui perbedaan sifat fisika tanah, sifat kimia tanah, jumlah mikroba tanah, dan pertumbuhan vegetatif tanaman jagung pada dua SOP budidaya yang berbeda.

Budidaya SOP Unsoed menggunakan dosis POH 20 ton/ha, urea 100 kg/ha, SP-36 150 kg/ha, KCl 75 kg/ha, dan dolomit 200 kg/ha disertai dengan aplikasi MF dan Bio P60. Budidaya SOP Petani menggunakan dosis kotoran ayam 20 ton/ha, phonska 1 ton/ha dan ZA 250 kg/ha. Penelitian ini dilaksanakan pada tanggal 1 Desember 2022 sampai dengan Juni 2023 di *Experimental Farming* Fakultas Pertanian Universitas Jenderal Soedirman yang kemudian dilakukan analisis tanah di laboratorium perlindungan tanaman, laboratorium tanah, dan laboratorium agronomi Universitas Jenderal Soedirman. Variabel yang diamati adalah tinggi tanaman (cm), jumlah daun, bobot segar tanaman (g), bobot kering tanaman (g), panjang akar (cm), pH tanah, konduktivitas tanah ($\mu\text{mhos/cm}$), bobot isi tanah (g/ml), dan jumlah koloni mikroba pada tanah.

Hasil penelitian menunjukkan perlakuan budidaya SOP UNSOED berbeda nyata terhadap tinggi tanaman, bobot segar tanaman, bobot kering tanaman, pH tanah, konduktivitas tanah, bobot isi tanah, dan jumlah koloni mikroba pada tanah. Hasil penelitian juga menunjukkan perbedaan yang nyata terhadap jumlah daun dan panjang akar. Aplikasi budidaya SOP UNSOED memberikan hasil terbaik untuk pertumbuhan vegetatif tanaman jagung yaitu dengan tinggi tanaman sebesar 159 cm, jumlah daun 13 helai, panjang akar 24 cm, bobot segar 163 g dan bobot kering 69 g, yang ditunjukkan masing-masing peningkatan 10,69%, 15,38%, 10,39%, 12,39%, dan 13,12%. Aplikasi budidaya SOP UNSOED meningkatkan jumlah mikroba tanah sebesar 87,25%. Aplikasi budidaya SOP UNSOED memberikan hasil terbaik pada derajat keasaman tanah dengan tingkat pH sebesar 5,98 dan konduktivitas tanah sebesar 0,44 $\mu\text{mhos/cm}$ yang ditunjukkan masing-masing peningkatan 21,11% dan 29,41%. Aplikasi budidaya SOP UNSOED juga memberikan hasil terbaik pada bobot isi tanah basah sebesar 1,26 g/ml dan bobot isi tanah kering sebesar 0,54% yang ditunjukkan masing-masing penurunan 13,49% dan 27,77%.

SUMMARY

*Biological organic fertilizer (POH) is enriched with biological agents. POH is a technology in cultivating agricultural plants. POH is applied to improve the quality and quantity of agricultural crops. Soil Laboratory at Jenderal Soedirman University produces MF (Microbial Phosphate). The Plant Protection Laboratory produces Bio P60 (*Pseudomonas fluorescens* P60) as a biological agent for plants. MF and Bio P60 were then applied to the cultivation of potato plants in Pekasiran Village, Batur District, Banjarnegara Regency and applied to the cultivation of corn plants at Experimental Farming, Faculty of Agriculture, Jenderal Soedirman University. The application of biological agents is combined with the use of synthetic fertilizer according to the dosage and biological organic fertilizer which is granulated first. This combination of cultivation technologies is then called UNSOED SOP cultivation. The aim of this research is to determine the differences in soil physical properties, soil chemical properties, number of soil microbes, and vegetative growth of corn plants in two different cultivation SOPs.*

UNSOED SOP cultivation uses a dose of POH 20 tons/ha, urea 100 kg/ha, SP-36 150 kg/ha, KCl 75 kg/ha, and dolomite 200 kg/ha accompanied by the application of MF and Bio P60. Cultivation of SOP Farmers use a dose of chicken manure of 20 tons/ha, phonska 1 ton/ha and ZA 250 kg/ha. This research was carried out from December 1 2022 to June 2023 at the Experimental Farming Faculty of Agriculture, Jenderal Soedirman University, and then soil analysis was carried out in the plant protection laboratory, soil laboratory and agronomy laboratory at Jenderal Soedirman University. The variables observed were plant height (cm), number of leaves, plant fresh weight (g), plant dry weight (g), root length (cm), soil pH, soil conductivity ($\mu\text{mhos/cm}$), soil bulk weight (g/ml), and the number of microbial colonies in the soil.

The results of the research showed that the SOP UNSOED cultivation treatment had significant differences in plant height, plant fresh weight, plant dry weight, soil pH, soil conductivity, soil unit weight, and number of microbial colonies in the soil. The research results also showed significant differences in the number of leaves and root length. The application of SOP UNSOED cultivation gave the best results for vegetative growth of corn plants, namely with a plant height of 159 cm, number of leaves of 13, root length of 24 cm, fresh weight of 163 g and dry weight of 69 g, which showed an increase of 10.69% respectively. , 15.38%, 10.39%, 12.39%, and 13.12%. The application of UNSOED SOP cultivation increased the number of soil microbes by 87.25%. The application of UNSOED SOP cultivation gave the best results in soil acidity with a pH level of 5.98 and soil conductivity of 0.44 $\mu\text{mhos/cm}$ which showed an increase of 21.11% and 29.41% respectively. The application of SOP UNSOED cultivation also gave the best results with a wet soil bulk weight of 1.26 g/ml and a dry soil bulk weight of 0.54% which was shown to decrease 13.49% and 27.77% respectively.