RINGKASAN

Permintaan tanaman pegagan di Indonesia terus meningkat, namun produksinya belum mampu mencukupi kebutuhan industri. Tanah Ultisol memiliki potensi yang luas untuk dijadikan lahan budidaya, tetapi rendahnya ketersediaan fosfat menjadi masalah utama. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian tiga isolat bakteri pelarut fosfat (BPF), yaitu S3, N15, dan N19, baik secara tunggal maupun kombinasi. Bakteri tersebut akan diberikan ke media tanah ultisol untuk mengetahui pengaruhnya terhadap pertumbuhan dan hasil tanaman pegagan di tanah Ultisol. Penelitian dilaksakanan pada bulan Juni 2024 hingga September 2024 di *screenhouse* Fakultas Pertanian Universitas Jenderal Soedirman menggunakan Rancangan Acak Lengkap (RAL) dengan 9 perlakuan dan 3 ulangan (blok). Variabel yang diamati meliputi tinggi tanaman, jumlah daun, luas daun, panjang dan bobot akar, bobot tajuk, bobot segar dan kering tanaman, serta kandungan klorofil.

Hasil penelitian menunjukkan bahwa perlakuan P5 (Isolat S3 & N19) memberikan pengaruh terbaik terhadap sebagian besar variabel seperti bobot segar dan kering tanaman, bobot akar, serta bobot tajuk. Nilai tertinggi ditemukan pada tinggi tanaman (12,4 cm), jumlah daun (30 helai), luas daun (32,9 cm^2), panjang akar (9,8 cm), bobot tajuk segar (4,5 g), bobot akar segar (1,15 g), bobot tanaman segar (5,8 g), bobot tajuk kering (0,39 g), bobot akar kering (0,15 g), bobot tanaman kering (0,53 g), dan jumlah stolon (5 stolon per tanaman). Sementara itu, nilai tertinggi variabel kandungan klorofil diperoleh perlakuan P7 (kombinasi S3, N15, dan N19), yaitu sekitar 19,6 mg/L. Perlakuan tunggal dan kontrol menunjukkan hasil yang lebih rendah dibandingkan perlakuan kombinasi.

Penggunaan kombinasi isolat bakteri pelarut fosfat pada penelitian ini cukup baik dalam meningkatkan pertumbuhan dan hasil tanaman pegagan pada tanah Ultisol. Bakteri pelarut fosfat mampu melarutkan fosfat agar tersedia dan diserap oleh tanaman. Pemberian agen hayati pada tanah marginal dapat menjadi solusi untuk mengatasi keterbatasan lahan subur.

SUMMARY

The demand for Centella asiatica (pegagan) in Indonesia continues to rise, yet its production remains insufficient to meet industrial needs. Ultisol soil has great potential as a growing medium, but its low phosphate availability poses a major constraint. This study aimed to determine the effects of applying three phosphate-solubilizing bacteria (PSB) isolates—S3, N15, and N19—either individually or in combination, on the growth and yield of pegagan grown in Ultisol soil. The research was conducted from June to September 2024 in a screenhouse at the Faculty of Agriculture, Universitas Jenderal Soedirman, using a Completely Randomized Design (CRD) with 9 treatments and 3 replications (blocks). Observed variables included plant height, number of leaves, leaf area, root length and weight, shoot weight, fresh and dry plant biomass, and chlorophyll content.

The results of the study showed that treatment P5 (a consortium of isolates S3 and N19) gave the best results for most observed variables, including fresh and dry plant weight, root weight, and shoot weight. The highest values were recorded for plant height (12.4 cm), number of leaves (30 leaves), leaf area (32.9 cm²), root length (9.8 cm), fresh shoot weight (4.5 g), fresh root weight (1.15 g), total fresh weight (5.8 g), dry shoot weight (0.39 g), dry root weight (0.15 g), total dry weight (0.53 g), and number of stolons (5 stolons per plant). Meanwhile, the highest chlorophyll content was observed in treatment P7 (a combination of isolates S3, N15, and N19), with a value of approximately 19.6 mg/L. Single-isolate treatments and control plots produced lower results compared to the consortium treatments.

The use of phosphate-solubilizing bacterial consortium in this study proved effective in enhancing the growth and yield of Centella asiatica in Ultisol soil. These bacteria were able to solubilize bound phosphate, making it available for plant uptake. The application of such bio-agents on marginal soils may offer a sustainable solution to the limitations of fertile land