

RINGKASAN

Bawang merah (*Allium ascalonicum* L.) merupakan salah satu komoditas hortikultura yang populer di Indonesia. *Bacillus subtilis* merupakan bakteri antagonis yang mampu mengendalikan beberapa patogen pada tanaman dengan cara menghambat pertumbuhannya. *B. subtilis* dapat diformulasikan dalam bentuk biopestisida nanopartikel. Biopestisida nanopartikel dapat berupa nanosuspensi dan nanoemulsi. Penelitian bertujuan untuk mengetahui aplikasi nanobiopestisida *B. subtilis* B315 yang efektif dan mengevaluasi pertumbuhan dan hasil tanaman bawang merah.

Penelitian ini dilaksanakan di *screen house* Desa Tambaksari Kidul, Kecamatan Kembaran, Kabupaten Banyumas dan Laboratorium Agronomi dan Hortikultura Fakultas Pertanian, Universitas Jenderal Soedirman dari bulan April sampai Juni tahun 2024. Penelitian ini menggunakan rancangan acak kelompok (RAK) yang terdiri atas 3 perlakuan, yaitu K, N, dan B. Formula nanobiopestisida *B. subtilis* B315 yaitu K = Kontrol dengan air steril, N = nanobiopestisida *B. subtilis* B315 konsentrasi 10 mL/L, dan B = *B. subtilis* B315 formula cair konsentrasi 10 mL/L. Setiap perlakuan diulang sebanyak 9 kali, sehingga semua terdapat 27 unit percobaan. Setiap 1 unit percobaan terdiri dari 1 *polybag*, setiap 1 *polybag* terdapat 3 tanaman, sehingga seluruh *polybag* yang digunakan berjumlah 27 dan 81 tanaman. Variabel yang diamati yaitu jumlah daun, tinggi tanaman, laju pertumbuhan tanaman, klorofil a, b, jumlah umbi, bobot umbi, diameter umbi, bobot tanaman segar, dan bobot tanaman kering. Data yang diperoleh dari hasil penelitian dianalisis menggunakan analisis ragam (ANOVA) pada taraf 5%. Jika hasil analisis menunjukkan adanya pengaruh nyata ($F_{hitung} > F_{tabel}$) maka diuji lanjut menggunakan uji BNT (Beda nyata terkecil) pada taraf 5%.

Hasil penelitian menunjukkan nanobiopestisida *B. subtilis* B315 memberikan peningkatan pada klorofil a 36%. *B. subtilis* B315 formula cair memberikan hasil efektif pada tinggi tanaman 25 hst meningkat 3,7% dan bobot tanaman kering terjadi peningkatan 95%.

SUMMARY

Shallots (Allium ascalonicum L.) are one of the popular horticultural commodities in Indonesia. Bacillus subtilis is an antagonistic bacteria that is able to control several pathogens in plants by inhibiting their growth. B. subtilis can be formulated in the form of nanoparticle biopesticides. Nanoparticle biopesticides can be in the form of nanosuspensions and nanoemulsions. The study aims to determine the effective application of B. subtilis B315 nanobiopesticide and evaluate the growth and yield of shallot plants.

This research was carried out at the screen house of Tambaksari Kidul Village, Kembaran District, Banyumas Regency and the Laboratory of Agronomy and Horticulture, Faculty of Agriculture, Jenderal Soedirman University from April to June 2024. This study used a group randomized design (RAK) consisting of 3 treatments, namely K, N, and B. Nanobiopesticide formula B. subtilis B315, namely K = Control with sterile water, N = nanobiopesticide B. subtilis B315 with a concentration of 10 mL/L, and B = B. subtilis B315 liquid formula with a concentration of 10 mL/L. Each treatment was repeated 9 times, so that there were 27 experimental units in total. Each 1 experimental unit consists of 1 polybag, each 1 polybag contains 3 plants, so that the total polybags used are 27 and 81 plants. The variables observed were the number of leaves, plant height, plant growth rate, chlorophyll a, b, number of tubers, tuber weight, bulb diameter, fresh plant weight, and dry plant weight. The data obtained from the results of the study were analyzed using variety analysis (ANOVA) at the level of 5%. If the results of the analysis show a real influence ($F \text{ count} > F \text{ table}$), then it is further tested using the BNT test (Smallest real difference) at the level of 5%.

The results of the study showed that the nanobiopesticide B. subtilis B315 provided an increase in chlorophyll a by 36%. B. subtilis B315 liquid formula gave effective results at plant height of 25 hst increased by 3.7% and dry plant weight increased by 95%.