

RINGKASAN

Bawang merah memiliki status sebagai komoditas hortikultura bernilai tinggi (*high value commodity*). Kebutuhan bawang merah yang selalu meningkat tiap tahunnya sehingga penggunaan pupuk anorganik dalam jumlah banyak untuk meningkatkan hasil produksi bawang merah dilakukan secara terus-menerus. Namun, pupuk anorganik yang melebihi dosis anjuran berpotensi mengakibatkan kerusakan tanah yang dapat menurunkan kualitas lahan. Salah satu usaha meminimalkan penggunaan pupuk anorganik berlebih adalah dengan memanfaatkan bakteri diazotrof sebagai pupuk hayati untuk meminimalisir jumlah N sintetik. Penelitian ini bertujuan untuk: 1) Mengetahui respon pertumbuhan dan hasil tanaman bawang merah terhadap bakteri diazotrof. 2) Mengetahui dan memilih isolat bakteri diazotrof yang paling baik untuk pertumbuhan dan hasil tanaman bawang merah.

Penelitian dilaksanakan di *Screen House* Fakultas Pertanian Universitas Jenderal Soedirman dengan ketinggian tempat 110 mdpl dan Laboratorium Agronomi dan Hortikultura Fakultas Pertanian, Universitas Jenderal Soedirman. Penelitian berupa percobaan polibag yang dilaksanakan menggunakan Rancangan Acak Kelompok Lengkap (RAKL) non-faktorial. Perlakuan jenis isolat bakteri diazotrof terdiri dari 9 jenis yaitu $I_1 = \text{LCR3}$, $I_2 = \text{LAR5}$, $I_3 = \text{LBR1}$, $I_4 = \text{LAZ2}$, $I_5 = \text{LAZ3}$, $I_6 = \text{LCA1}$, $I_7 = \text{LAR3}$, $I_8 = \text{LAA5}$, dan $I_9 = \text{LAA4}$. Terdapat 9 perlakuan dan 1 kontrol masing-masing diulang 3 kali. Variabel yang diamati terdiri dari tinggi tanaman, jumlah daun, kehijauan daun, panjang akar total, volume akar, bobot tajuk kering, bobot akar kering, rasio akar:tajuk, jumlah umbi, volume umbi, bobot umbi segar, bobot umbi eskip, indeks panen. Data yang diperoleh dianalisis menggunakan uji F, jika hasil analisis berbeda nyata maka dilanjutkan uji DMRT $\alpha: 0,05$.

Hasil penelitian aplikasi bakteri diazotrof dapat meningkatkan pertumbuhan dan hasil tanaman bawang merah. Variabel yang berpengaruh nyata yaitu jumlah daun, kehijauan daun, bobot tajuk kering, bobot akar kering, rasio akar/tajuk, jumlah umbi sebesar 70,72%, dan bobot umbi eskip sebesar 90,63% dibandingkan dengan kontrol. Perlakuan isolat LCR3 menghasilkan angka tertinggi pada variabel bobot umbi eskip mencapai 16,871 g/rumpun .

Kata kunci : bawang merah, bakteri diazotrof, nitrogen

SUMMARY

Shallots have a status as a high value commodity in horticultural. Demand for shallots is increasing every year so that the use of inorganic fertilizers in large quantities to increase the production of shallots is carried out continuously. However, inorganic fertilizers fertilizer that exceeds the recommended dose has potential to cause soil degradation which can reduce land quality. One of the efforts to minimize the excessive use of inorganic fertilizers is to use diazotrophic bacteria as biological fertilizers to minimize the amount of synthetic N. This study was aimed to: 1) Study the growth response and yield of shallots to diazotrophic bacteria. 2) Study and selecting the best diazotrophic bacterial isolates for the growth and yield of shallots.

This research was conducted in Screen House of the Faculty of Agriculture, Jenderal Soedirman University with an altitude of 110 meters above sea level and Agronomy and Horticulture laboratory of the Faculty of Agriculture, Jenderal Soedirman University. This study was arranged using a Randomized Completely Block Design (RCBD). The treatment in this reaserch consisted of $I_1 = LCR3$, $I_2 = LAR5$, $I_3 = LBRI$, $I_4 = LAZ2$, $I_5 = LAZ3$, $I_6 = LCA1$, $I_7 = LAR3$, $I_8 = LAA5$, and $I_9 = LAA4$. There are 9 treatments and a control each repeated 3 times. The variables observed consisted of plant height, number of leaves, leaf greenness, total root length, root volume, shoot dry weight, root dry weight, root shoot ratio, number of bulb, bulb volume, fresh bulb weight, sun dried bulb weight, and harvest index. The data obtained was analyzed using F test, if the result was different then continued with DMRT test $\alpha: 0,05$.

The results showed that application of diazotroph bacteria can increase the growth and yield of shallots. Application of diazotroph bacteria has a significant effect on number of leaves, leaf greenness, dry shoot weight, dry root weight, root shoot ratio, number of bulb by 70.72%, and sun dried bulb weight by 90.63% compared to the control. Treatment LCR3 produced the highest number of sun dried bulb weight reach 16.871 g.

Keyword : Shallots, diazotrophic bacteria, nitrogen