RINGKASAN

Bawang merah merupakan salah satu komoditas sayuran unggulan Indonesia yang kebutuhannya selalu meningkat dari tahun ke tahun. Tetapi masih belum bisa optimal dalam pengusahaannya. Perlu adanya suatu alternatif untuk meningkatkan produktifitas bawang merah, salah satunya adalah dengan pemberian pupuk hayati mikoriza-azolla. Penelitian bertujuan untuk : 1) Mengkaji respon fisiologis tanaman bawang merah dengan penambahan pupuk hayati mikoriza-azolla dan pengurangan dosis pupuk sintetik, 2) Mengetahui dosis pupuk hayati mikoriza-azolla dan pengurangan dosis pupuk yang paling tepat terhadap pertumbuhan dan hasil tanaman bawang merah.

Penelitian dilaksanakan pada bulan Agustus 2016 sampai dengan Oktober 2016 di s*creen house* Fakultas Pertanian, Universitas Jenderal Soedirman (UNSOED), Kelurahan Karangwangkal, Kecamatan Purwokerto Utara dan Laboratorium Agronomi dan Hortikultura Fakultas Pertanian UNSOED, Purwokerto. Penelitian menggunakan rancangan *Central Compposite Second Order Design* (CCSOD) dengan rancangan dasar Rancangan Acak Lengkap (RAL) yang terdiri dari 13 kombinasi perlakuan dari 2 faktor percobaan. Faktor pertama adalah penambahan pupuk hayati mikoriza-azolla yang terdiri dari 5 taraf yaitu (6, 12, 18, 24, 30 gram/tanaman). Faktor kedua adalah pengurangan dosis pupuk sintetik yaitu 80% (1,1 gram/tanaman); 60% (2,0 gram/tanaman); 40% (2,9 gram/tanaman); 20% (3,8 gram/tanaman); 0% (4,7 gram/tanaman). Variabel yang diamati berupa jumlah klorofil total, jumlah dan lebar bukaan stomata, serapan unsur P, tinggi tanaman, warna daun, bobot tanaman segar, bobot tanaman kering bobot umbi segar, dan bobot umbi kering. Data hasil pengamatan ditabulasi dan dianalisis menggunakan analisis Metode Respon Permukaan atau *Response Surface Methodology* (RSM) dengan bantuan Minitab 14.

Hasil penelitian yaitu pemberian pupuk hayati mikoriza-azolla 6,00 – 30,00 gram per tanaman dan pengurangan dosis pupuk sintetik hingga 80% memberikan pengaruh yang sama terhadap jumlah klorofil total, jumlah dan lebar stomata, serapan P, tinggi tanaman, warna daun, bobot tanaman segar, bobot tanaman kering, bobot umbi segar dan bobot umbi kering. Dosis pupuk yang paling efisien untuk pertumbuhan dan hasil tanaman bawang merah adalah 6,00 gram pupuk hayati mikoriza-azolla dan 2,90 gram pupuk sintetik per tanaman.

SUMMARY

Shallot is one of Indonesia's considered superior vegetable commodities whose in need is always increase year by year. But it is still not optimal in ithe exploitation. It is need an alternative to increase the productivity of shallot, one of them is by giving of mychorrizhal-azolla biofertilizer. The research aims to: 1) Assess the physiological response of shallot added with mychorrizhal-azolla biofertilizer and reducing of synthetic fertilizer dosage, 2) to know the dosage of mychorrizhal-azolla biofertilizer and the most appropriate reduction dosage of fertilizer on the growth and yield of shallot.

The research was conducted in August 2016 until October 2016 at screen house of Faculty of Agriculture, University of Jenderal Soedirman (UNSOED), Karangwangkal Subdistrict, North Purwokerto Subdistrict and Agronomy and Horticulture Laboratory of Faculty of Agriculture UNSOED, Purwokerto. The research used the design of Central Composite Second Order Design (CCSOD) with the basic design of Completely Randomized Design (CRD) consisted of 13 treatment combinations from 2 experimental factors. The first factor was addition the mychorrizhal-azolla biofertilizer consisted of 5 levels (6, 12, 18, 24, 30 gram / plant). The second factor was reduction dosage of synthetic fertilizer, consisted of 80% (1,1 gram/plant); 60% (2,0 gram/plant); 40% (2,9 gram/plant); 20% (3,8 gram/plant); 0% (4,7 gram/plant). The variables observed were number of total chlorophyll, number and width of stomatal opening, P absorbtion, plant height, leaf color, fresh plant weight, dry plant weight, fresh bulb weight and driy bulb weight. Observational data was tabulated and analyzed using Response Surface Methodology analysis by Minitab 14 help.

The results of the research was giving of mycorrhizal azolla dosage about 6.00 - 30.00 gram per plant and reducing of synthetic fertilizer dosage up to 80% gave the same effect on the number of total chlorophyll, the number and width of opening stomatal, P absorbtion, plant height, leaf color, fresh plant weight, dry plant weight, fresh bulb weight and dry bulb weight. The most eficient dosage of fertilizer for growth and yield of shallot was 6,00 gram of mycorrhizal-azolla biofertilizer and 2,90 gram of synthetic fertilizer per plant.