RINGKASAN

Perubahan iklim global berpengaruh terhadap sektor pertanian di Indonesia, khusunya pada budidaya tanaman yaiu terjadinya genangan air selama periode waktu tertentu. Pemakaian air yang efisien pada budidaya tanaman pangan sangat diperlukan untuk mempertahankan ketahanan pangan. Ketersediaan air yang cukup terutama untuk menghadapi tantangan akibat perubahan iklim global sangat penting agar ketahanan pangan dalam negeri terjaga dan tercukupi. Strategi adaptasi produksi pertanian terhadap perubahan iklim dapat dilakukan dengan pengembangan varietas baru tanaman yang lebih tahan terhadap cekaman genangan. Jewawut merupakan tanaman serealia (biji – bijian) yang mudah dibudidayakan, dapat ditanam, pada lahan kering atau lahan marginal, tingkat adaptasi tinggi, produksi tanaman cukup tinggi dan mempunyai banyak manfaat yaitu bisa digunakan sebagai bahan pangan ataupun ternak. Jewawut memiliki potensi dalam mendukung pengembangan diversifikasi pangan karena memiliki kandungan gizi dan serat yang hampir setara dengan beras. Perlu dilakukan penelitian secara lebih lanjut terhadap batas toleransi dan respons cekaman genangan pada tanaman jewawut. Penelitian ini bertujuan mengetahui: (1) batas toleransi cekaman genangan terhadap pertumbuhan, hasil tanaman jewawut, (2) pengaruh efisiensi pemberian pupuk N, P, K terhadap pertumbuhan dan hasil tanaman jewawut dan (3) bagaimana toleransi cekaman genangan dan efisiensi pemberian pupuk N, P, K terhadap pertumbuhan dan hasil tanaman jewawut.

Penelitian ini telah dilaksanakan secara eksperimental di *green house* Fakultas Pertanian, Universitas Jenderal Soedirman, Laboratorium Riset Universitas Jenderal Soedirman dan Laboratorium Tanah Fakultas Pertanian Universitas Jenderal Soedirman pada bulan April 2020 sampai Desember 2020. Rancangan penelitian yang digunakan yaitu Rancangan Acak Kelompok Lengkap (RAKL), terdiri dari 3 ulangan dengan 2 faktor yaitu 4 taraf dosis pupuk N, P, K dan 4 tingkat perlakuan genangan. Faktor pertama adalah dosis pupuk N, P, K yaitu 25% (0,222 g N/polibag, 0,242 g P_2O_5/polibag, 0,121 g K_2O/polibag), 50% (0,445 g N/polibag, 0,484 g P_2O_5/polibag, 0,318 g K_2O/polibag), 75% (0,668 g N/polibag, 0,726 g P_2O_5/polibag, 0,363 g K_2O/polibag), 100% (0,891 g N/polibag, 0,969 g P_2O_5/polibag, 0,484 g K_2O/polibag) dan faktor tingkat genangan (tanpa genangan, genangan 1 – 2 cm, genangan 2 – 3 cm, genangan 4 – 5 cm). Variabel yang diamati meliputi variabel karakter pertumbuhan, karakter fisiologi tanaman, serta karakter komponen hasil dan hasil. Variabel pertumbuhan terdiri atas tinggi tanaman, jumlah daun, luas daun. Variabel karakter fisiologis tanaman terdiri atas bukaan stomata, kerapatan stomata, klorofil A, klorofil B, total klorofil, konsentrasi N. Variabel komponen hasil dan hasil terdiri atas umur berbunga,umur panen, panjang malai, bobot malai, bobot basah tanaman, dan bobot kering tanaman. Data yang diperoleh dianalisis menggunakan uji F, apabila terdapat keragaman dilanjutkan *uji Duncan's Multiple Range Test* (DMRT) pada taraf 5%.

Hasil analisis ragam menunjukkan bahwa perlakuan kombinasi dosis pupuk N, P, K dan genangan berpengaruh nyata terhadap luas daun, bukaanstomata dan kerapatan stomata. Hasil luas daun lebih baik pada kombinasi dosis pupuk 100% N, P, K pada tanpa genangan yaitu 106,22 cm^2 bila dibandingkan

dengan kombinasi dosis pupuk 25% N, P, K pada genangan 4 – 5 cm mengalami penurunan menjadi 12,00 cm^2, hasil bukaan stomata lebih baik ditunjukkan pada kombinasi dosis pupuk 50% N, P, K pada tanpa genangan yaitu 7,91 µm bila dibandingkan dengan kombinasi dosis pupuk 50% N, P, K pada genangan 4 – 5 cm menjadi 2,91 µm, hasil kerapatan stomata lebih baik ditunjukkan pada kombinasi dosis pupuk 50% N, P, K pada tanpa genangan yaitu 266,41/mm^2 bila dibandingkan dengan kombinasi dosis pupuk 100% N, P, K pada genangan 4 – 5 cm menjadi 165,72/mm^2. Tanaman jewawut masih memiliki batas toleransi untuk tumbuh pada genangan 1 – 2 cm dilihat dari hasil tanaman yaitu pada bobot basah tanaman dan bobot kering tanaman lebih rendah, masing – masing 23,01 % dan 20,70% dibandingkan dengan perlakuan tanpa genangan. Perlakuan dosis pupuk N, P, K 50% dan tanpa genangan merupakan perlakuan terbaik dan mampumeningkatkan pertumbuhan dan hasil tanaman jewawut.

SUMMARY

The climate change global, especially for the agricultural sector in Indonesia, has a significant effect on cultivated plants that have been damaged by rainwater inundation for some time. Long periods of the rainy season have the potential for waterlogging. Efficient use of water in the cultivation of food crops is very necessary to maintain food security in conditions of water availability which is in order to face the challenges caused by global climate change so that domestic food security is maintained and fulfilled. The strategy of adaptation of agricultural production to climate change can be carried out with thedevelopment of new varieties of crops that are more resistant to inundation.Jewawut is a cereal crop (grain) that is easy to cultivate, can be grown, on dry land or marginal land, a high level of adaptation, crop production is quite high and has many benefits, namely it can be used as food or livestock. Jewawut has the potential to support the development of food diversification because it has a nutritional and fiber content that is almost equivalent to rice. It is necessary to conduct further research on tolerance limits and inundation stress responses in jewawut plants. This study aims to: (1) determine the tolerance limit of inundationchecks on the growth and yield of jewawut plants, (2) find out the effect of N, P, K fertilizer application on the growth and yield of jewawut plants, (3) find out the effect of inundation checks and the application of N, P, K fertilizers on the growth and yield of jewawut plants.

This research has been carried out experimentally in the experimental land of the screen house of the Faculty of Agriculture, Universitas JenderalSoedirman, the Research Laboratory of the University of Jenderal Soedirman, the Soil Laboratory of the Faculty of Agriculture, Universitas Jenderal Soedirman. In April 2020 to December 2020. The research design used was a Complete Group Randomized Design (RAKL), consisting of 3 tests with 2 factors, namely 4 dose levels of N, P, K fertilizer and 4 levels of waterlogging treatment. The first factor is the dose of fertilizer N, P, K which is 25% (0.222 g N/polybag, 0.242 g P_2O_5/polybag, 0.121 g K_2O/polybag), 50% (0.445 g N/polybag, 0.484 g P_2O_5/polybag, 0.318 g K_2O/polybag), 75% (0,668 g N/polybag, 0.726 g P_2O_5/polybg, 0.363 g K_2O/polybag), 100% (0,891 g N/polybag, 0.969 g P_2O_5/polybag, 0.484 g K_2O/polybag) and waterlogging level factors (without waterlogging, waterlogging 1 – 2 cm, waterlogging 2 – 3 cm, waterlogging 4 – 5 cm). Observed variables include growth variables, plant physiological characters yield and as well as yield and yield components characters. The growth variable consists of plant height, number of leaves, leaf area. The physiological analysis variable consists of stomata openings, stomata density, chlorophyll A, chlorophyll B, total chlorophyll, concentration of N. The variable components of yield and yield consist of flowering age, harvest life, panicle length, panicle weight, plant wet weight, plant dry weight.. Data obtained were analyzed using the F test, if there was diversity continued duncan's Multiple Range Test (DMRT) test at alevel of 5%.

The results of analysis of varience showed that the combined treatment of N, P, K fertilizer doses and waterlogging had a noticeable effect on leaf area,

stomata openings, and stomata density. The results of leaf area were better at the combination of 100% N, P, K fertilizer doses without waterlogging, which was 106.22 cm2 when compared to the combination of 25% N, P, K fertilizer doses at 4-5 cm inundation decreased to 12 cm^2, the results of stomata openings are better shown in the combination of fertilizer doses of 50% N, P, K at no inundation namely 7,91 µm when compared to the combination of fertilizer doses of 50% N, P, K, in inundations of 4-5 cm to 2,91 µm and the result of stomata density were better shown in the combination of fertilizer doses of 50% N, P, K at no inundation of 266,41/mm^2 when compared to the combination of fertilizer doses of100% N, P, K in inundations of 4-5 cm to 165,72/mm^2. Jewawut plants still have atolerance limit for growing in inundation 1-2 cm. it can be seen from the results ofthe plants, namely the plant wet weight and plant dry weight were lower, respectively 23,01% and 20,70% compare to the treatment without waterlogging. The treatment of fertilizer doses without waterlogging is the best treatment and is able to increase the growth and yield of jewawut plant.