PENGARUH KETERSEDIAAN AIR TERHADAP RESPONS FISIOLOGIS DAN PRODUKTIVITAS GAMA MELON PARFUM (*Cucumis melo* L. 'GMP')

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INTISARI

Kultivar Gama Melon Parfum ('GMP') merupakan hasil persilangan antara melon Natsuno Omoide (NO-3) dengan Miyamauri (MR-5) pada tahun 2011. 'GMP' memiliki karakter fenotipik unik, yaitu rasa daging buah yang pahit serta menghasilkan aroma yang lebih kuat dibanding kedua indukannya karena ditemukan senyawa aroma esensial baru. Budidaya melon 'GMP' tidak mudah sehingga perlu penanganan intensif. Namun, penelitian mengenai pengaruh lingkungan khususnya cekaman ketersediaan air belum pernah dilaksanakan sehingga pengetahuan mengenai respons fisiologis dan hasil produksi akibat cekaman masih terbatas. Tujuan penelitian ini yaitu untuk mengetahui respons fisiologis dan produktivitas melon 'GMP' pada kondisi kapasitas lapangan 50%, 75%, dan 100% serta genangan 2 cm, 4 cm, dan 8 cm diatas permukaan tanah. Parameter yang diukur adalah respons pertumbuhan yang terdiri dari tinggi tanaman, diameter batang, jumlah daun, biomassa tanaman, dan rasio akar:tajuk; respons fisiologis yang terdiri dari kadar klorofil, kadar karotenoid, dan kadar prolin; serta produktivitas yang terdiri dari jumlah buat total per tanaman, berat segar buah, kadar air buah, serta morfologi buah. Data dianalisis menggunakan analisis variansi (ANOVA-*one way*) pada taraf kepercayaan 95% dan dilanjutkan dengan uji *Duncan Multiple Range Test* (DMRT). Hasil penelitian menunjukkan bahwa pada perlakuan kapasitas lapangan 100% meningkatkan diameter batang dan perlakuan kapasitas lapangan 50% meningkatkan rasio akar:tajuk melon 'GMP'. Perlakuan genangan 8 cm diatas permukaan tanah menurunkan diameter batang dan rasio akar:tajuk melon 'GMP'. Perlakuan kapasitas lapangan 50% menurunkan klorofil total daun melon 'GMP. Perlakuan genangan 8 cm diatas permukaan tanah meningkatkan kadar klorofil total daun melon 'GMP'. Perlakuan kapasitas lapangan 50% meningkatkan berat segar buah dan perlakuan genangan 2 cm diatas permukaan tanah menurunkan berat segar buah. Perlakuan genangan 2 cm menurunkan kadar air buah dan perlakuan genangan 8 cm meningkatkan kadar air pada buah melon 'GMP'.

Kata Kunci: Gama Melon Parfum ('GMP'), Kekeringan, Genangan, Respons Fisiologis Tanaman, Pertumbuhan.

THE EFFECT OF WATER AVAILABILITY ON PHYSIOLOGICAL RESPONSES AND PRODUCTION YIELDS GAMA MELON PARFUM (*Cucumis melo* L. 'GMP')

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ABSTRACT

Gama Melon Parfum ('GMP') cultivar is a result of crossbreeding between the Natsuno Omoide (NO-3) and Miyamauri (MR-5) melon varieties in 2011. 'GMP' exhibits a unique phenotypic characteristic, including a bitter taste of the fruit flesh and produces a stronger aroma compared to its parent varieties due to the discovery of new essential aroma compounds. Cultivating 'GMP' melons is challenging, necessitating intensive management. However, research on environmental influences, particularly water availability stress, has not been conducted, limiting knowledge regarding physiological responses and productivity resulting from stress. The objective of this study is to investigate the physiological responses and productivity of 'GMP' melon plants under different conditions: field capacity at 50%, 75%, and 100%, as well as inundation at 2 cm, 4 cm, and 8 cm above the soil surface. Parameters measured include growth response, comprising plant height, stem diameter, leaf number, plant biomass, and root-to-shoot ratio; physiological response, including chlorophyll content, carotenoid content, and proline content; and productivity, consisting of total fruit yield per plant, fresh fruit weight, fruit moisture content, and fruit morphology. Data were analyzed using one-way analysis of variance (ANOVA) at significancy level of 95% confidence, followed by Duncan Multiple Range Test (DMRT). The results of the study showed that treatment with 100% field capacity increased stem diameter, while treatment with 50% field capacity increased the root-to-shoot ratio of 'GMP' melon plants. Submergence treatment at 8 cm above the soil surface decreased stem diameter and root-to-shoot ratio of 'GMP' melon plants. The 50% field capacity treatment reduced the total chlorophyll levels in 'GMP' melon leaves. Submergence treatment at 8 cm above the soil surface increased the total chlorophyll levels in 'GMP' melon leaves. The 50% field capacity treatment increased fruit fresh weight, while submergence treatment at 2 cm above the soil surface decreased fruit fresh weight. Submergence treatment at 2 cm reduced fruit water content, whereas submergence treatment at 8 cm increased water content in 'GMP' melon fruits.

Keywords: *Drought, Flooding, Gama Melon Perfume ('GMP'), Growth, Plant Physiological Responses.*