

INTISARI

Bawang merah merupakan komoditas hortikultura strategis di Indonesia. Produktivitas bawang merah dapat terganggu akibat cekaman biotik seperti penyakit moler, maupun cekaman abiotik seperti kekeringan. Aplikasi jamur mikoriza dapat menjadi alternatif yang ramah lingkungan untuk meningkatkan ketahanan tanaman. Penelitian ini bertujuan untuk mengamati pengaruh aplikasi mikoriza terhadap ketahanan tanaman bawang merah terhadap penyakit moler dan cekaman kekeringan, serta menganalisis respon fisiologis dan anatominya. Penelitian menggunakan Rancangan Acak Kelompok Lengkap (RAKL) dengan dua faktor dan tiga ulangan. Faktor pertama berupa interval penyiraman, yakni tanaman disiram tiap dua hari sekali (kontrol) dan enam hari sekali (cekaman kekeringan). Perlakuan kedua adalah inokulasi dengan *F. acutatum*, aplikasi jamur mikoriza, kombinasi inokulasi *F. acutatum* dan jamur mikoriza, serta kontrol negatif. Parameter yang diamati antara lain parameter pertumbuhan, hasil panen, ketahanan penyakit (periode inkubasi, insidensi, intensitas, AUDPC), fisiologi – biokimia, lignifikasi, kolonisasi akar oleh jamur mikoriza, densitas dan bukaan stomata, serta anatomi akar dan daun bawang merah. Data dianalisis dengan ANOVA, diikuti dengan uji Tukey HSD pada taraf kepercayaan 95%. Selain itu dilakukan juga uji korelasi Pearson dan *Principal Component Analysis* (PCA) untuk memahami hubungan antar-parameter. Hasil dari penelitian ini adalah aplikasi jamur mikoriza mampu mengurangi intensitas dan laju perkembangan penyakit moler pada bawang merah, baik pada kondisi kapasitas lapang maupun tercekam kekeringan. Selain itu aplikasi jamur mikoriza mampu mempertahankan kadar klorofil dan karotenoid daun, karakter fisiologi, pertumbuhan, dan hasil panen tanaman bawang merah terhadap penyakit moler dan cekaman kekeringan.

Kata kunci: AMF, respons kombinasi cekaman, resistensi tanaman, cekaman air

ABSTRACT

Shallot is a strategic horticultural commodity in Indonesia. Shallot productivity can be disrupted by biotic stresses such as twisted disease, as well as abiotic stresses such as drought. Mycorrhizal fungi application can be an environmentally friendly alternative to enhance plant resistance. This study aimed to observe the effect of mycorrhizal application on the resistance of shallot plants to twisted disease and drought stress, and to analyze their physiological and anatomical responses. The research used a Randomized Complete Block Design (RCBD) with two factors and three blocks. The first factor was the watering interval: plants were watered every two days (control) and every six days (drought stress). The second treatment was inoculation with *F. acutatum*, mycorrhizal fungi application, a combination of *F. acutatum* and mycorrhizal fungi application, and a negative control. The parameters observed included growth parameters, yield, disease resistance (incubation period, incidence, intensity, AUDPC), physiology – biochemical responses, lignification, root colonization by mycorrhizal fungi, stomatal density and aperture, and root and leaf anatomy of shallot. The data were analyzed using ANOVA, followed by Tukey HSD test at the 95% confidence level. Pearson correlation analysis and Principal Component Analysis (PCA) were also conducted to understand the relationship between parameters. The results of this study indicate that the application of mycorrhizal fungi can reduce the severity and disease progression of twisted disease in shallots, both under field capacity conditions and drought stress. Additionally, the application of mycorrhizal fungi can maintain chlorophyll and carotenoid content in leaves, physiological characteristics, growth, and yield of shallot plants against twisted disease and drought stress.

Keywords: AMF, combined stress responses, plant resistance, water deficit