

The Effect of Drought Stress and Arbuscular Mycorrhizal Fungi Dosage on the Growth and Seed Production of Tomatoes (*Solanum lycopersicum*). The Effect of Drought Stress and Arbuscular Mycorrhizal Fungi Dosage on the Growth and Seed Production of Tomatoes (*Solanum lycopersicum*). Supervised by Ir. Dwi Rahmawati, S.P., M.P. IPM.

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ABSTRACT

Tomatoes (*Solanum lycopersicum* L.) are a strategic horticultural crop whose production is often hampered by abiotic stress in the form of drought, particularly during the generative phase. This study aims to examine the effects of drought stress, arbuscular mycorrhizal fungi (AMF) dosage, and their interaction on the growth, yield components, and physiological quality of tomato seeds. The study was conducted at the Jember Greenhouse from August to December 2025 using a two-factor completely randomized design (CRD) with three replications. The first factor was the level of drought stress based on field capacity (FC), consisting of 100% FC (K1), 80% FC (K2), and 60% FC (K3). The second factor was the FMA dose, consisting of 10 grams/polybag (M1), 15 grams/polybag (M2), and 20 grams/polybag (M3).

The results of the analysis of variance (ANOVA) showed that the single factor of drought stress had a highly significant effect on all observed parameters. Severe drought conditions (K3) significantly reduced growth performance and seed physiological quality. The single factor of FMA dose had a highly significant effect on increasing plant height, number of leaves, seed weight per plant, and seed physiological quality components, with a dose of 20 grams per polybag (M3) as the optimal treatment. The interaction between the two factors (KxM) had a significant to highly significant effect on plant height, the percentage of empty seeds, 1,000seed weight, yield potential per hectare, and germination rate. The K3M3 treatment combination (60% KL + 20 grams of FMA) proved effective in mitigating the negative effects of severe water stress by reducing the percentage of empty seeds to 41.83% (compared to 48.18% in K3M1) and maintaining seed viability with a germination rate of 66.00% (compared to 49.33% in K3M1).

Keywords: Tomato, Drought Stress, Arbuscular Mycorrhiza, Seed Production.