Iranian Journal of Horticultural Science and Technology 21 (1): 107 - 122 (2020)

Effects of Drought Stress on Physiological and Biochemical Indices in Hybrid Apple Rootstocks

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This study was performed to screen some hybrid apple rootstocks for drought stress using physiological and biochemical indices in leaves. The experiment was carried out in a CRBD design, in a factorial scheme 12×2 (12 gynotypes of apple and 2 irrigation regimes) with three replicates. The types of apple studied were 1 year old plants including genotypes AR1 to AR11 accompanied by MM111 as control (drought tolerant). Irrigation regimes applied in this study were 40 and 80 percent of FC Under drought stress. The apple rootstocks exhibited physiologically and biochemically different responses. Drought stress indices evaluated in this experiment were reduction of cell membrane stability, photosynthetic pigments, and chlorophyll fluorescence, accumulation of proline and malondialdehyde contents. In this experiment at least one of the aforementioned indicators was observed in the AR1, AR3, AR5, and AR7 being identified as sensitive rootstocks. In contrast, the rest of rootstocks with the most physiological stability and the least damage were considered drought stress tolerant and selected for further studies.

Keywords: Carotenoids, Chlorophyll Fluorescence, Rootstock, Membrane Stability, Proline.

[DOR: 20.1001.1.16807154.1399.21.2.2.8]

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