Agriculture and Climate Change - Adapting Crops to Increased Uncertainty (AGRI 2015)

Comparison of Physiological Parameters for Drought in Tomatoes Between Early Stage in Pot and Mature Stage in Field

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Abstract

Forty-five days old tomato plants grown in pot and 122 days old tomato plants grown in field were compared for drought responses. The relationships between young and mature plants responses will be useful to shorten the drought breeding process and it will not be necessary to grow the melon plants until the mature stage. Therefore time, labor and money can be saved in the drought breeding programs. Twenty-four different tomato genotypes were used for the pot and field experiments. The stomatal conductance, membrane injury, leaf water potential, leaf osmotic potential, leaf temperature, leaf Ca and K concentrations, shoot fresh weight and the visual shoot appearance by the 1-5 scale evaluation were investigated. The degree of the drought stress was 50 % irrigation of the control plants. The main results of the tomato research were: 1) The data relative to control showed definitely higher relationships than the data in absolute under the drought, 2) The most important relationships between young and mature tomato plants that can be used to shorten screening/breeding process were stomatal conductance (r = 0.608), leaf calcium (Ca) concentration (r = 0.573), membrane injury index (r = 0.510), leaf water potential (r = 0.499), shoot fresh weight (r = 0.477), shoot damage visual scale appearance (r = 0.314) and the leaf potassium concentration (r = 0.2043), respectively.

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