

A Comparative Study on the Physiological Consequences of Short Moisture Stress in Selected Tomato Cultivars during the Flowering Stage

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Abstract

Improved drought resistance is a major objective in plant breeding programmes for crops grown in semi-arid regions without irrigation. The importance of plant water for the maintenance and turgidity required for plant growth and/or survival is widely recognized. The drought-resistant plants have smaller water deficit-per-unit decrease in leaf water potential than more drought-susceptible plants. An experiment was conducted to evaluate the moisture stress responses of selected tomato cultivars on Relative Water Content (RWC) and Diffusive Resistance (DR). 'KC-1', 'Roma' and 'Thilina' tomato cultivars were selected for this purpose. The experiment was laid out in the Randomized Complete Block Design with six treatments and four replications. Moisture stress was imposed to the selected tomato cultivars during the early flowering stage for a period of 6 days. The control plants were watered to Field Capacity at two days interval. The 3rd or 4th leaf from the apex which was matured recently was selected for the determination of RWC and DR. These parameters were measured for the stressed plants on the 6th day from the onset of the stress. Similar measurements were made for the control plants as well on the same day. Moisture stress significantly increased the Diffusive Resistance and reduced the Relative Water Content of all the tomato cultivars. 'KC 1' tomato cultivar exhibited the highest moisture stress tolerance (72% RWC), compared to 'Roma' (66% RWC) and 'Thilina' (62% RWC) tomato cultivars. Hence, 'KC 1' cultivar was identified as the drought resistant tomato cultivar to cultivate under drought condition prevailing in the Eastern region.

Keywords: Diffusive resistance, moisture stress, Relative Water Content, tomato.