BIOCHEMICAL EFFECTS OF MOISTURE STRESS IN

TOMATO (Lycopersicon esculentum Mill.)



BY

VIJITHA RANJITHAMOORTHY



DEPARTMENT OF AGRONOMY

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ibrary, EUSI

FACULTY OF AGRICULTURE

EASTERN UNIVERSITY

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ABSTRACT

Studies were conducted in the Agronomy farm of the Eastern University, Sri Lanka to investigate the biochemical responses of soil moisture stress in tomato cv. 'KC-1' during the vegetative, flowering, early fruiting and fruit ripening stages. The experiment was layed out in the Randomized Complete Block Design with five treatments and four replications for each treatment. Moisture stress was imposed for different treatments for a period of 4 days per treatment during the above growth stages. Moisture stress was imposed by withholding water completely at once. The control plants were watered daily to field capacity.

Moisture stress increased the proline content of tomato leaves. A trend of increase in the proline content was observed with the maturity of plants when subjected to moisture stress. There was a decrease in the proline content after 5-6 hrs of supplying water and returned to the control value within 48 hrs of re-watering in all the treatments. Moisture stress reduced the chlorophylls a and b contents of the leaves. Plants which experienced moisture stress during the vegetative and flowering stages showed higher reductions in the chlorophyll contents than the rest of the growth stages. It also was observed that moisture stress caused higher reduction in the chlorophyll b content. The reason for this observation needs to be investigated. There was a partial recovery in the chlorophylls a and b contents of plants after re-watering. The chlorophyll contents recovered faster during the vegetative stage than the flowering stage.

Moisture stress reduced the vitamin C contents of fruits. The Total Soluble Solids and the acid contents of the fruits were slightly affected by moisture stress when the

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stress was given during the fruit ripening stage. Moisture stress during the flowering stage showed the highest reduction in the yield of tomato compared to other growth stages. This reduction was mainly attributed to reduced number of flowers, reduction in the size of newly formed flowers and the abscission of flowers and flower buds when the stress was imposed during the flowering stage.

Key words: Moisture stress, Proline, Chlorophylls a and b, Vitamin C, Total Soluble Solids and Acid content.

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