Studies on the influence of moisture stress on certain agronomic parameters of tomato (*Lycopersicon esculentum* Mill.)

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Abstract

An experiment was conducted at the Eastern University, in Batticaloa district of Sri Lanka during the '*Yala*' 2007, to determine the influence of moisture stress on certain agronomic parameters of tomato (*Lycopersicon esculentum* Mill.) at different growth stages. The experiment was arranged in the Randomized Complete Block Design (RCBD) with five treatments and four replications. The parameters measured were Leaf Area Index (LAI), Root Length Density (RLD) and Specific Leaf Area (SLA).The yield was also determined. The total fresh weight of harvested fruits of each plot was obtained separately for yield determination. Moisture stress was imposed during the vegetative, flowering, early fruiting and fruit ripening stages. A period of four days stress was given during the above growth stages and the experiment was managed in accordance with the recommended cultural practices. Rain shelters were constructed to prevent the entry of rain water into the excremental plots during rainy days. The data were statistically analyzed using the Analysis of Variance (ANOVA) to detect the significance between treatments. The differences between the treatments were compared by Duncan's Multiple Range Test (DMRT).

Moisture stress reduced the LAI, RLD and SLA of tomato irrespective of the stages of growth. The highest reduction in LAI was observed during the vegetative stage. It was 46.42% compared to control. The reduction of RLD may be due to the inhibition of root growth by reduced cell expansion. The flowering stage showed the highest reduction in the RLD. It was 14.04 % compared to control. The highest reduction in SLA was observed when the stress was imposed during the vegetative stage. Moisture stress reduced the yield of tomato and the reduction was highest when the stress was imposed during the flowering stage. It was 58.82% compared to control. 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 during the flowering stage. Hence, the flowering stage was identified as the most critical stage of growth sensitive to moisture stress in tomato.

Keywords: Moisture stress, Leaf Area Index, Root Length Density, Specific Leaf Area