

A STUDY ON THE RESPONSES OF COWPEA VARIETY 'DHAWALA' AND MAIZE VARIETY 'RUWAN' TO MOISTURE STRESS WITH PARTICULAR REFERENCE TO LEAF AREA AND SELECTED PHYSIOLOGICAL PARAMETERS

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ABSTRACT

A study was conducted in the Green House of the Agronomy Farm at the Eastern University of Sri Lanka to determine the Agronomic and Physiological responses of moisture stress of maize variety 'Ruwan' and cowpea variety 'Dhawala' during the vegetative, flowering and seed development stages of these crops. The experiment was laid out in a Completely Randomized Design (CRD) with four treatments and four replications. Moisture stress was imposed for different treatments for a period of 8 days each at the above growth stages. The stress treatment was imposed by withholding water completely at once. The control plants were watered to field capacity at four days interval.

Moisture stress reduced the leaf area of cowpea and maize and the reduction was the highest at the flowering and seed development stages of these crops. There was a complete recovery in the leaf area of plants, which previously underwent moisture stress at the vegetative stage. There was no complete recovery in the leaf area of plants, which formally experienced moisture stress at the flowering and seed development stages.

Moisture stress significantly increased the stomatal resistance of these plants irrespective of the growth stages. The increase was fairly high at the flowering and seed development stages than the vegetative stage. There was a complete recovery in the stomatal resistance by subsequent watering. There were significant reductions in the transpiration rate, leaf water potential and relative water content of these plants as

a result of moisture stress. The reductions were higher at the flowering and seed development stages than the vegetative stage.

Moisture stress reduced the yield of maize and cowpea. The reduction was highest when the stress was imposed at the silking stage in maize and flowering stage in cowpea. Moisture stress at the seed development stage of maize and cowpea showed significantly lower yield than the control. There was no significant reduction in the yield of maize and cowpea when the stress was imposed at the vegetative stage of the crop compared to the control. The germination percentage of the seeds and the total biomass of the crop too were analysed. There were significant differences in the germination percentage and the total biomass of maize when the stress was imposed at the silking and seed development stages.

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