

Net Photosynthetic Rate and Yield of Selected Chilli (*Capsicum annuum* L.) Cultivars as Affected by Soil Moisture Stress during the Flowering Stage

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Abstract

The importance of plant water for the maintenance and turgidity required for plant growth and survival is widely recognized. The drought resistant plants have smaller water deficit - per - unit decrease in leaf water potential than more drought susceptible plants. Therefore a field experiment was conducted to evaluate moisture stress responses on the Net Photosynthetic Rate and yield of chilli cultivars namely; 'MI 1', 'MI-hot' and 'Arunalu'. Moisture stress was imposed for a period of 15 days during the flowering stage and control plants were watered to field capacity at 5 days interval. The experiment was laid out in the Randomized Complete Block Design with 2 × 3 factor, factorial arrangement. Moisture stress significantly ($p < 0.05$) reduced the Net Photosynthetic Rate (Ps) of all the tested cultivars. The highest Ps ($29.7 \mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$) was obtained in the 'Arunalu' while the lowest Ps ($20.8 \mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$) was found in the 'MI 1' under water stress condition. The highest yield (1398 kg ha^{-1}) was obtained in the 'Arunalu' and the lowest (842 kg ha^{-1}) was found in the 'MI 1' under water deficit situation. It was found that 'Arunalu' was able to show a substantially high rate of photosynthesis and yield than the other two cultivars under moisture stress condition. A high Ps found in 'Arunalu' would have caused better growth and development and thereby better yield under stressful environment. Hence, 'Arunalu' was identified as the most drought tolerant chilli cultivar among the tested ones which could be suggested for cultivation in the drought prone areas of the sandy regosols.

Keywords: Moisture stress, Net photosynthetic Rate, Stress tolerance, Yield

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