



Research Article

**Effect of limited irrigation and nitrogen levels on relative water content, transpiration rate, photosynthetic rate and transpirational cooling of Indian mustard [*Brassica juncea* (L.)]**

R.K. SAUD AND B.P. SINGH

**Abstract :** A field investigation was carried out to study the effect of limited irrigation and nitrogen levels on relative water content, transpiration rate, photosynthetic rate and transpirational cooling of Indian mustard. The study indicated that the Indian mustard variety Laxmi maintained higher photosynthetic rate, transpiration rate and more cooler canopy than the variety RH-9304. The higher rate of photosynthetic and transpiration were recorded at flowering as compared to siliqua development stage and irrigation could enhance their rates at both the stages. The nitrogen levels showed variation in leaf photosynthesis rate, transpiration rate, transpirational cooling and relative water content. Application of 120 kg Nha<sup>-1</sup> recorded highest leaf photosynthesis, transpiration rate, transpirational cooling and relative water content during both the years of study.

**Key Words :** Limited irrigation, Nitrogen levels, Relative water content, Transpiration rate, Photosynthetic rate, Transpirational cooling, Indian mustard

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**INTRODUCTION**

The productivity of oil seeds in India is around 935 kg ha<sup>-1</sup> as compared to world level of 1632 kg ha<sup>-1</sup>. A major reason for the low average yield is the cultivation of oil seeds mostly under conditions where soils are both thirty and hungry. Less or no use of plant nutrient is one of the important factors for low productivity of oilseeds. Also, there is an inherent biological limitation for the yield of oil seeds (Mandal *et al.*, 2001). Rapeseed – mustard is the second

most important group of oilseed crops in India after groundnut. High yielding varieties of Indian mustard brought break through in yield barriers but the yield potential of these varieties has not been fully exploited and some of the agronomic aspects need to be standardized and optimized for obtaining potential yield per unit area. Tissue water relations, canopy temperature and solar radiation availability alter many agro-physiological response of plants including the diurnal photosynthetic activity which is responsible for overall productivity of the crop (Yadav and Singh, 1981). Since, Indian mustard is mostly raised on conserved soil moisture conditions and in water scarcity areas in India, it becomes very essential to analyse the water relations and micro environment which help to identify the drought resistance (Singh *et al.*, 1994). Hence, a study was undertaken to know about different components of plant water relations in Indian mustard varieties under limited irrigation and nitrogen levels.

**MEMBERS OF RESEARCH FORUM**

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