

COMPARATIVE PHYSIOLOGICAL STUDIES IN RICE (*Oryza sativa* L.) UNDER NORMAL AND SALINE CONDITIONS.

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ABSTRACT

A pot experiment was conducted in normal and saline soil ($EC_e - 6 dS m^{-1}$) to study the physiological behaviour of salt tolerant and salt sensitive rice cultivars. Total dry matter production and total leaf area of the cultivars decreased in salinity compared to the normal soil however, relationship between total dry matter production and total leaf area for all the cultivars at both soil conditions remained similar. The values of specific leaf weight (SLW) and net assimilation rate (NAR) increased steadily from first to the last harvest in normal soil whereas, it showed a decline under salinity. The values of relative growth rate (RGR) generally increased after the first harvest and then decreased in the last harvest for all the cultivars under both the soil conditions. A positive but non-significant correlation was observed between SLW and NAR in normal soil but negative and non-significant under salinity stress. A positive but non significant correlation was observed between RGR and NAR under normal soil and negative but significant correlation was found between RGR and NAR under salinity stress.

INTRODUCTION

To keep pace with the fast growing food requirements more food production per unit area and per unit time is the need of the day. Food production can be accelerated either by providing the environments favourable for the plant growth or by changing the genetic make-up of the

MATERIALS AND METHODS

The experiment was conducted at Soil Salinity Research Institute, Pindi Bhattian (Gujranwala) during Kharif, 1988. Nursery of four rice varieties/strains was raised in field conditions in normal soil. Previously tested cultivars IR-6 and 44677 were used as salt tolerant genotypes, whereas Bas-6141 and 44935 were used as salt sensitive genotypes. Forty days old nursery was transplanted into glazed pots each containing 10 Kg of soil with two salinity levels i.e. control and $EC-6 dSm^{-1}$. In all there were twenty pots for each variety/cultivar. Thus each variety had ten pots at each salinity level. Three plants were maintained in each pot. Agronomic requirements of the pots were met uniformly according to the need of the plants. Data regarding leaf area and total dry weight on per plant basis were recorded after regular intervals of ten days. First sampling/harvest was made fifteen days after nursery transplantation, thus providing a chance to the plants for anchorage and establishment in the pots. At the time of each sampling, pots were washed draining out all the soil from the pot to get all the roots. Plant samples were oven dried at $60^{\circ}C$ to get their dry weight. Sampling was started on July 25, 1988 and lasted upto September 3, 1988. At each sampling six plants (two pots) of each variety were taken at random. The following characteristics