

EFFECT OF DIFFERENT SALINITY TYPES AND LEVELS ON PADDY YIELD AND SODIUM, POTASSIUM, CALCIUM AND MAGNESIUM UPTAKE BY RICE

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ABSTRACT

The study was carried out in glazed pots. Non-saline non-sodic, clay loam soil was used and four salinity levels of 40, 60, 80 and 100 meq Γ^{-1} were developed. NaCl, Na_2SO_4 , MgCl_2 , MgSO_4 and CaCl_2 were utilised for development of salinity levels. Rice variety B-198 was planted and harvested at maturity. NPK was applied @ 140-56-28 Kg ha^{-1} respectively.

Significant effect of salinity types and levels was observed on dry matter yield and maximum and minimum yield of 123.50 and 74.62 g-pot $^{-1}$ was obtained with Na_2SO_4 and NaCl respectively. On an average, maximum dry matter yield of 114.34 g-pot $^{-1}$ was found under lowest salinity level of 40 meq Γ^{-1} . Salinity types affected the sodium uptake significantly but levels failed to indicate significant effect. Maximum 0.32 g-pot $^{-1}$ Na was observed under Na_2SO_4 . On an average, higher uptake of potassium was observed where Na_2SO_4 was used and minimum where NaCl and MgSO_4 were used. Calcium uptake was significantly affected by salinity types and levels and highest uptake was recorded where CaCl_2 was applied @ 80 meq Γ^{-1} . Sodium chloride salinity was more deleterious to plant growth and nutrients uptake.

MATERIALS AND METHODS

The study was carried out in Soil and Water Testing Laboratory of Mona Reclamation Experimental Project during 1983-84. Soil was collected from the project area representing upper 15cm depth. The fertility status and physical and chemical properties are reported in Table-1. The soil was air dried, ground and passed through 2mm sieve and homogenized by thorough mixing. Ten kg of air dried soil was taken in glazed pots measuring 26x26cm and four salinity levels of 40, 60, 80 and 100 meq Γ^{-1} were developed by using NaCl, Na_2SO_4 , MgCl_2 , MgSO_4 and CaCl_2 individually. The salts were mixed thoroughly with the soil and proper moisture stress was created to bring the salts in equilibrium with the soil and NPK were applied @ 140-56-28 kg ha^{-1} . The treatments tested were:

- Salinity types = 5 (NaCl, Na_2SO_4 , MgCl_2 , MgSO_4 , CaCl_2).
- Salinity levels = 4(40, 60, 80 & 100 meq Γ^{-1})