

## **Enhancing and stabilizing productivity of rice based cropping system in salt-affected areas of Indo-Gangetic region through improved germplasm and management strategies**

RK SINGH<sup>1</sup>; ABDELBAGI ISMAIL<sup>2</sup>; GLENN B. GREGORIO<sup>2</sup>; D K SHARMA<sup>3</sup>; R K GAUTAM<sup>3</sup>; C L VERMA<sup>3</sup>; Y P SINGH<sup>3</sup>; RANVIR SINGH<sup>3</sup>; A K NAYAK<sup>3</sup>

<sup>1</sup> Central Soil Salinity Research Institute, Karnal, India

<sup>2</sup> International Rice Research Institute, Philippines

<sup>3</sup> Central Soil Salinity Research Institute – Regional Research Station, Lucknow, India

Large areas in the Indo-Gangetic plains are facing one or more abiotic stresses and limit crop yields. India incurs about 12% losses to the production system, while Uttar Pradesh alone loose about Rs. 33.7 billion annually due to these stresses. Hence, salt affected soils due to their large extent; provide a scope for the horizontal expansion of the productivity through increased area. Saline and alkaline (sodic) soils are two major types of salt affected soils which adversely affect the plant growth. There could be two possible ways to overcome these stresses; (i) either improve the soil environment for the normal plant growth; (ii) or improve the plant itself which can be grown in that environment. There could be third, hybrid approach, based on exploitation of synergies between the environment modifying technologies and plant based approaches. This is a more viable and efficient approach with huge potential. Theme 1 of CGIAR Challenge Programme on Water and Food has project entitled “Development of technologies to harness the productivity potential of salt-affected areas of Indo-Gangetic, Mekong and Nile river basins”, initiated by IRRI as coordinating centre to achieve its overall objective i.e. “To increase the crop water productivity such that food security can be ensured and farmers’ livelihoods enhanced without increasing water diverted for agriculture over the amount diverted in the year 2000.” The part of the project in Indo-Gangetic plains dealing especially with sodicity and inland salinity is being coordinated by CSSRI (Karnal and Lucknow centre) in collaboration with IRRI. Project’s aim is to enhance crop establishment and productivity of rice based cropping systems and to maximize the cropping intensity in salt-affected areas by integrating genetic improvement and management strategies, which are environmentally sustainable and socially acceptable to various resource users. To attain this aim, two approaches viz. “in-built tolerance of the genotype” and “environment i.e. nutrient management & cultural practices” are being adopted. Major work is being taken up at the farmers’ field with their full involvement in technology generation, testing and transfer. The end users of this multifaceted project would be the poor farmers in salt affected areas. Intermediary beneficiaries would be plant breeders in terms of germplasm exchange. Extension and management persons will be benefited from the new management strategies and decision support tools.