

# AICRP on MANAGEMENT OF SALT AFFECTED SOILS AND USE OF SALINE WATER IN AGRICULTURE, ICAR-CSSRI KARNAL

## MANDATE OF AICRP

- Survey and characterization of salt affected soils and ground water quality in major irrigation commands.
- Evaluate the effects of poor quality waters on soils and crop plants.
- Develop management practices for utilization of waters having high salinity/alkalinity and toxic ions.
- Develop and test technology for the conjunctive use of poor quality waters in different agro-ecological zones/major irrigation commands.
- Screen crop cultivars and tree species appropriate to salinity and alkalinity soil conditions.
- Develop alternate land use strategies for salt affected soils.

## MISSION

Development of advance technologies for management of salty soil and water under different agro-climatic conditions of the country.

## VISION

Sustainable use of salty affected soil and water for improving the livelihood security of the farmers.

## SIGNIFICANT ACHIEVEMENTS

- Ground water quality survey of Palwal, Sirsa and Fatehabad districts of Haryana, Thanjavur and Thiruvavur district of Tamil Nadu, Kannauj district of UP, Hoshangabad and Dhar district of MP, Three blocks of Sikar and four blocks of Sri Ganganagar district of Rajasthan were completed and maps being generated.
- Sewage-sludge application for pearl millet-wheat crop (@ 5t/ha) in salt affected soils at Hisar showed that it is potential source of nutrients.
- Pre-planting application of treated distillery effluent (TDE) @ 1.25 lakh litres/ha together with NP fertilizer gave higher sugarcane yields

over control. Similarly, TDE along with irrigation water @ 1:20 dilutions 4 times (45, 95, 135 and 175 days) during the crop growth period also resulted in higher yield of sugarcane at Trichy.

- Reclamation of calcareous sodic soils with distillery spent wash @ 5 lakh liters/ha increased the rice yields with significant reduction in soil pH and ESP at Trichy.
- Adoption of reclamation technology in abandoned aqua ponds at farmers' fields increased the grain yield of paddy by 12-30 % as compared to control at Bapatla.
- Experiment at Bapatla showed that capsicum is more tolerant to saline water irrigation than leafy vegetables and okra. Capsicum yield increased by 3 to 4 times under shadenets with saline water irrigation.
- Relative efficacy of distillery and sugar industry waste on reclamation and crop production in sodic Vertisols at Indore centre revealed that 98 to 114 % increased grain yield of paddy and 82 to 113% of wheat were obtained with application of Lagoon Sludge @ 5 t/ha + RSW (Raw Spent Wash) @ 2.5 LL/ha over control.
- Wheat variety Raj 3077 showed its superiority over Raj 4188, KRL 210 and KRL 213, in dry land saline conditions prevailing in Bikaner district of Rajasthan. Raj 3077 produced significantly higher grain yield over other varieties at all level of saline irrigation. KRL 210 tolerated salt stress better than other varieties.
- Performance of KRL 210 grown at farmers fields found better than KRL 213 at ECe 7.8 dS/m as per Bikaner centre.
- In case of rice crop, saving of 13 to 34.1 cm of irrigation water in controlled drainage system in saline waterlogged condition in Tungabhadra command is observed as compared to conventional SSD system because of reduced drainage discharge. The removal of salts was nearly 1.93 vs. 0.56, 4.61 vs. 1.22,

3.64 vs. 1.16 and 3.85 vs. 1.06 t/ha through conventional and controlled system, respectively. The mean loss of nitrogen (NO<sub>3</sub>-N) over four season was more (11.20 kg/ha) under conventional as compared to controlled SSD (5.32 kg/ha).

- Significantly higher grain yield (45.97 q/ha) was obtained in puddled transplanted rice (PTR) followed by laser levelling in DSR with mulch (27.77 q/ha) at Gangawati. The lower grain yields under DSR as compared to PTR could be due to slightly higher soil salinity under DSR affecting germination as well as less leaching as compared to transplanting.

#### LOCATIONS OF COOPERATING CENTRES

- Raja Balwant Singh College, Bichpuri, Agra (Uttar Pradesh)
- Regional Research Station, Acharya N.G. Ranga Agricultural University, Bapatla (Andhra Pradesh)
- S.K. Rajasthan Agricultural University, Bikaner (Rajasthan)
- Agricultural Research Station, University of Agricultural Sciences, Gangawati (Karnataka)
- C.C.S. Haryana Agricultural University, Hisar (Haryana)
- Agriculture College, R.V.S. Krishi Vishwa Vidyalaya, Indore (Madhya Pradesh)
- Agriculture College, C.S. Azad University of Agriculture & Technology, Kanpur (Uttar Pradesh)
- A.D. Agricultural College and Research Institute, Tamil Nadu Agricultural University, Trichy (TN)

#### VOLUNTEER CENTRES

- Regional Station, Punjab Agricultural University, Bathinda (Punjab)
- Khar Land Research Station, Konkan Krishi Vidyapeeth, Panvel (Maharashtra)

- Rice Research Station, Kerala Agricultural University, Vytilla, Kochi (Kerala)
- ICAR-Central Island Agricultural Research Station, Port Blair (A&N Island)

#### FIVE BEST TECHNOLOGIES/PRODUCTS

- Low cost technology of artificial ground water recharge (Agra)
- Distillery spent wash (DSW) for reclamation of alkali soils and waters (Trichy/Indore)
- Sewage-sludge as potential source of nutrients in salt affected soils (Hisar)
- Raised and sunken bed technology (Indore)
- Vegetable cultivation with saline water in naturally ventilated protected structures (ICAR-CSSRI, Karnal)

#### NEW INITIATIVES

- Seaweed cultivation for coastal farmers (Bapatla)
- Silicon use for alleviation of salinity stress in rice (Bapatla)
- CSR Bio for fruit cultivation in sodic conditions (Kanpur)
- Rice-prawn integration in Pokkali lands (Kochi)

#### FINANCIAL OUTLAY

For AICRP (Rs. In lakh)

	XII Plan	Budget (2015-16)		
		RE	Actual Expenditure	% Utilization
Plan	3675.00	590.00	590.00	99.97
Non-Plan	196.45	35.00	32.88	93.93
Total	3871.45	515.00	512.75	96.95

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