



# CSSRI

## Central Soil Salinity Research Institute

Karnal 132 001 (Haryana)

### Courses

1. Reclamation and Management of Salt Affected Soils
2. Use of Poor Quality Waters in Agriculture

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Central Soil Salinity Research Institute (CSSRI) is a pioneer research institute of international repute pursuing basic and applied researches on the reclamation and management of salt affected soils in the country besides developing technologies for the use of poor quality water in agriculture. The institute was established in 1969 during the fourth plan period. Nearly 6.73 million hectares of soils in the country are salt affected and broadly categorized into alkali and saline soils. CSSRI has played a vital role in developing viable technologies for the amelioration of saline and alkali soils and use of marginal qualities irrigation waters in different agro-ecological regions of the country. All India Coordinated Research Project on the 'Management of salt affected soils and use of saline waters in agriculture' is also located at Karnal with eight coordinating centres in different parts of the country. The alkali land reclamation package developed by the institute has been extended to more than 1.5 million hectares degraded lands contributing nearly 8-10 million tonnes additional food grains to national stock. For waterlogged saline soils, sub-surface drainage technology developed by the institute has been widely adopted in different states resulting into the reclamation of more than 50000 hectares of waterlogged saline soils. Guidelines on the use of saline and sodic waters for irrigation are being followed throughout the country. High yielding salt tolerant varieties of rice (CSR 10, CSR 13, CSR 17, CSR 23, CSR 30, CSR 36, Sumati and Bhootnath), wheat (KRL 1-4, KRL 19), Indian mustard (CS 52, CS 54) and gram (Karnal Chana 1) developed by CSSRI are being grown in more than 70,000 hectares area in the country. For the reclamation of highly degraded alkali and saline soils, various afforestation and agro forestry techniques have been developed. Several salt tolerant forest and fruit trees, grasses and other forages besides various medicinal plants of high economic value have been identified. Location specific technologies are developed for the reclamation and management of salt affected soils of Indo-Gangetic plains, salt affected vertisols and coastal saline soils. Over the years, CSSRI has grown into an internationally recognized institute, was bestowed with ICAR's best institute award in 1998 and provides consultancies to various national and international agencies.

# 1. Reclamation and Management of Salt Affected Soils

## Training Programme

The course is designed to strengthen knowledge and skills of the participants on amelioration of salt affected soils through chemical, hydrological and biological approaches

## Faculty

About 50 qualified and trained scientists of the institute and invited speakers from the ICAR and SAUs will constitute the faculty

**Course Director** : Dr Gurbachan Singh

**Duration** : 2 weeks

**Course fee/ trainee** : US \$ 1000 per trainee

**No. of trainees per course** : 10 or more

**Accommodation** : To be arranged at the International Training Center (at the institute campus)

**Eligibility** : Master's / Doctorate degree in Agriculture or allied subjects with experience in salinity research and officially nominated by the Government on deputation

## Course Contents

- Extent, distribution, characteristics and nature of salt affected soils - National and global scenario
- Digital mapping of salt affected soils - GIS, GPS and satellite techniques
- Reclamation and management of alkali soils - chemical amendments, irrigation, nutrient use efficiency, cropping systems, crop diversification
- Reclamation and management of waterlogged saline soils - subsurface drainage technology: investigations, design and crop production, reuse of drainage waters, bio-drainage
- Reclamation and management of coastal saline soils
- Reclamation and management of salt affected vertisols
- Suitable crops and varieties for salt affected soils - genetics and physiological mechanisms and use of molecular techniques
- Alternate land use management - forest and fruit trees based agro forestry systems, soil amelioration by trees, grasses, forages and medicinal plants, bio fuel and bio energy plants

- Resource conservation technologies for the reclaimed salt affected soils
- Multi- enterprise agriculture for judicious use of natural resources, enhanced income and livelihood security of the farmers
- Conjunctive use of saline and alkali waters, sewage waters for irrigation
- Ground water recharge in salt affected soils, bio-remediation and phyto-remediation
- Decision support systems in management of salty soils and waters
- Socio-economic impact of reclamation of salt affected soils and Intellectual Property Rights issues



## 2. Use of Poor Quality Waters in Agriculture

### Training Programme

The course is designed to strengthen knowledge and skills of the participants on the use of poor quality waters in agriculture

### Faculty

About 50 qualified and trained scientists of the institute and invited speakers from the ICAR and SAUs will constitute the faculty

**Course Director** : Dr Gurbachan Singh

**Duration** : 2 weeks

**Course fee/ trainee** : US \$ 1000 per trainee

**No. of trainees per course** : 10

**Accommodation** : To be arranged at the International Training Center (at the institute campus)

**Eligibility** : Master's/Doctorate degree in Agriculture or allied subjects with experience in salinity research and officially nominated by the Government on deputation

### Course Contents

- Extent and nature of poor quality waters - saline waters, alkali waters, sewage and industrial effluents
- Assessing salinity and sodicity hazards of irrigation water, their characterization for efficient use in irrigation and their long term impacts on soil properties and crop growth
- Principles and practices of irrigation management with saline and sodic waters, reuse of drainage waters
- Integrated nutrient management practices under high RSC and saline water irrigation
- Geochemical cycles influencing origin of poor quality waters
- Application of remote sensing and GIS for diagnosing saline and sodic conditions
- Use of sewage waters for irrigation in different production systems - toxicity hazards and nutritional potential
- Use of industrial effluents for irrigation in different crops and tree production systems
- Bio-amelioration and bio-remediation of poor quality waters

- Suitable crops and varieties for poor quality waters - genetics and physiological mechanisms
- Raising forestry and horticultural plantations with saline, sodic and sewage waters
- Production of forage, grasses and medicinal plants with poor quality waters
- Ground water recharge in poor quality water area, bio drainage
- Modeling the impact of saline and sodic water use on soils and crops
- Socio-economic impact of use of poor quality waters for irrigation and Intellectual Property Rights issues
- Practical exercises on estimation of RSC, SAR, Adj. SAR of irrigation waters, determination of gypsum requirement of soils and for waters and biological properties of wastewaters for its use in agriculture

