

Announcement

10-DAY SHORT TRAINING COURSE

**Physiological, Biochemical and Molecular
Analysis for Studying Salt Tolerance in Crops**

**Hands-on Training | Research Skills | Crop
Stress Biology**

(05th October – 14th October 2026)



Organized by:



Division of Crop Improvement

**ICAR-Central Soil Salinity Research Institute,
Karnal - 132001**

INTRODUCTION

The ICAR–Central Soil Salinity Research Institute (ICAR-CSSRI), Karnal, is a premier national institute under the Indian Council of Agricultural Research (ICAR), dedicated to research, technology development and capacity building for the management of salt-affected soils and sustainable agricultural production. The Institute works on soil and water salinity, reclamation and management of salt-affected soils, development of salt-tolerant crops and integrated approaches for enhancing agricultural productivity under stress conditions. Through its multidisciplinary research and training programmes, ICAR-CSSRI contributes significantly to climate-resilient and sustainable agriculture in India. Based on the long experience in human resource development and in view of the fast-changing scenario of soil, plant, water analysis and instrumental methods and their applications, the Division initiated an advanced level training programme with desired emphasis on practical exercises and theoretical background of the subject suiting a wide range of applications.

OBJECTIVES

Training will be conducted with the major objectives of understanding the physiological mechanisms of salt stress and salt tolerance in crops. Design controlled experiments for evaluating crop responses to salinity. Assess growth, water relations and photosynthetic responses under salt stress. Estimate important biochemical indicators associated with salt tolerance. Analyze oxidative stress and antioxidant defense mechanisms. Understand ion homeostasis and Na^+/K^+ balance under salinity. Perform basic molecular analyses of salt-responsive genes. Hands on training to RNA isolation, cDNA synthesis and gene-expression analysis. Perform PCR/qPCR-based techniques for studying stress-responsive genes. Analyze, visualize and interpret experimental data. Integrate physiological, biochemical and molecular observations to identify salt-tolerant genotypes.

ABOUT THE COURSE

Soil salinity is one of the major abiotic stresses limiting crop productivity worldwide. Understanding how plants perceive, respond to, and tolerate salt stress requires an integrated approach involving physiological, biochemical and molecular analyses. This intensive 10-day short-term training course is designed to provide participants with practical knowledge and hands-on experience in modern techniques used to evaluate salt tolerance mechanisms in crops. The course will combine conceptual lectures with laboratory demonstrations, experimental exercises, data analysis and interpretation. Participants will learn how to design experiments and apply complementary approaches to characterize salt-stress responses from the whole-plant level to the molecular level.

DURATION

The duration of this training course is 10 days *i.e.* **05th October to 14th October, 2026.**

ELIGIBILITY & SELECTION CRITERIA

Scientists, Technical, Young Researchers, Ph.D. Scholars are eligible for nomination to the course. Candidates sponsored by Govt./Semi-Govt. organizations, NGOs, ICAR institutes *etc.* will be given preference. The applications/nominations will be scrutinized and formal acceptance letters will be issued to the selected candidates. Boarding and lodging arrangements will be made for the participants by the organizers. However, the TA/DA of the admitted candidates has to be borne by their sponsoring organizations, and ICAR-CSSRI will have no liability on this account.

Training Programme

S. No.	Major Theme	Practical / Hands-on Component
1.	Fundamentals of Salt Stress in Crops	Salt-stress experimental design, preparation of stress treatments, seed/seedling screening
2.	Plant Growth & Physiological Responses	Germination, root/shoot growth, biomass, relative water content and membrane stability
3.	Photosynthetic & Pigment Analysis	Chlorophyll/pigment estimation, photosynthetic response measurements and data interpretation
4.	Osmolytes & Biochemical Responses	Proline, soluble sugars, proteins and other osmolytes
5.	Oxidative Stress & Antioxidant Defense	H₂O₂, MDA/lipid peroxidation, SOD, CAT, POD/APX assays
6.	Ion Homeostasis & Salt Accumulation	Na⁺/K⁺ analysis, ion balance, calculation of salt tolerance-related indices
7.	Nucleic Acid Isolation & Quality Assessment	Genomic DNA/RNA isolation, concentration and purity assessment; electrophoretic analysis
8.	Gene Expression Analysis	RNA quality, cDNA synthesis, primer design/validation and PCR
9.	qPCR & Molecular Data Analysis	qPCR workflow, relative gene-expression analysis; ΔCt/$\Delta\Delta$Ct calculations
10.	Integration, Data Analysis & Research Applications	Statistical analysis, graphical presentation

HOW TO APPLY?

The application as per the given format, complete in all respects and duly signed by the sponsoring authority, should be sent to **Course Director, Division of Crop Improvement, ICAR-Central Soil Salinity Research Institute, Karnal - 132001**, via Registered Mail/Courier/E-mail (sksanwal2016@gmail.com; ashwanisharma107@gmail.com; singh.ak92@gmail.com), so as to reach him latest by **October 01, 2026**. The Application Form enclosed herein should be used.

IMPORTANT DATES

Last date for receipt of applications at CSSRI: **October 01, 2026**

Acceptance letters: **October 03, 2026**

For further details, please contact:

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Course Director

Division of Crop Improvement

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APPLICATION FORM
10-DAY SHORT TRAINING COURSE
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Tolerance in Crops
(05th October – 14th October 2026)

Name of the candidate.....
(in block letters)
Designation.....Age (yrs).....
Mailing address (with PIN Code)
.....
.....
Tel. No. (with STD Code) office.....
Residence.....Mobile.....
E-mailFax.....
Educational qualification.....
Experience: Laboratory yrs; Field..... yrs
Nature of present job.....

Signature of the Applicant with date

Declaration by the Sponsoring Authority

This is to certify that the information furnished above is correct. If the candidate is selected and intimated accordingly, the requisite fee will be paid by the due date and he/she will be relieved to participate in the said training at ICAR-IARI, New Delhi.

Signature of the Sponsoring Authority with Seal
Dated.....