

### Patron- in-Chief

Dr. S.M. Javed Akhtar, Member Science, PAEC, Islamabad

### Resource Persons

Prof. Dr. Muhammad Ashraf, *HI*, Chairman, PSF

Dr. Javed Akhter, Director, NIAB, Faisalabad

Dr. M. Yasin Ashraf *TI*, NIAB, Faisalabad

Prof. Dr. Rashid Ahmad, U.A., Faisalabad

Prof. Dr. Mumtaz Hussain, U.A., Faisalabad

Prof. Dr. Mansoor Hameed, UA, Faisalabad

Dr. Muhammad, Ashraf, NIAB, Faisalabad

Dr. Amjid Hameed, NIAB, Faisalabad

Dr. M. Rafiq Asi, NIAB, Faisalabad

Dr. Muhammad Saleem, NIAB, Faisalabad

Dr. Zafar Iqbal, NIAB, Faisalabad

Mr. Wajid Ishaq, NIAB, Faisalabad

### Organizing Committee

Dr. Javed Akhter (Director NIAB)

Dr. M.Yasin Ashraf *TI*, (Course Coordinator)

Dr. Tariq Mahmood (Head, SES Division)

Dr. Muhammad Ashraf (PS, SES Division)

Dr. M. Saleem (PS, SES Division)

Dr. Abdul Rasul Awan (PS, SES Division)

Mr. Jafar Hussain (PS, DAIT Group, NIAB)

Mr. Sajjad Mahmud (Pr. Administrator)

Mr. Zulfiqar Ali (Head LAO)

Mr. Sabir Ali Sabir, ARO (SES Division)

Mr. Muhammad Saleem, PSA (SES Division)

Mr. Mahood-ul-Hassan, PSA (SES Division)

Mr. Ansar Mahmood, PSA (SES Division)

Mr. Ghulam Farid, DEO, (SES Division)

Mr. Khaver Maqsood, SSA (SES Division)

### For Further Information

Dr. M. Yasin Ashraf *TI*, Course Coordinator  
Nuclear Institute for Agriculture and Biology (NIAB),  
Jhang Road, Faisalabad, Pakistan

Ph: 041-9201789

PABX: 041-9201751to69 (Ext.3055)

Cell:03007623885

Fax:041-9201776

Email: niabmyashraf@gmail.com

## Application Form

(Specimen)



PHOTO

Name:-----

Father's Name:-----

Official Position:-----

Univ./Organization:-----

Address:-----

Phone:(Off.)----- (Cell)-----

Fax:----- E-mail:-----

Date of birth:-----

Academic qualification:

Degree	Institution	Subject	Year
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M.Sc.

M.Phil.

Ph.D.

Research/training experience:-----

Particular interest for training:-----

Recommendation of Head of  
Institute/Department:-----

Accommodation required (Yes/No):-----

Student Rs. 1000/Day ; Professional Rs. 2000/Day

(Signature of applicant)

7<sup>th</sup> National Training Course

ON

“MODERN TECHNIQUES IN  
RESEARCH ON ABIOTICS STRESS  
TOLERANCE IN PLANTS”

March 06-10, 2017



NUCLEAR INSTITUTE FOR  
AGRICULTURE AND BIOLOGY (NIAB), FAISALABAD  
(PAKISTAN ATOMIC ENERGY COMMISSION)

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## About NIAB

Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad is a research and development centre having well-equipped laboratories and facilities such as Cobalt-60 irradiation sources, radiation measuring instruments, N-15 Analyzer, UV and IR Spectrophotometers, Atomic absorption spectrophotometers, ICP, Porometer, Pressure chamber, Osmometer, Gas chromatographs, HPLC, Amino acid analyzer, PCR, High speed electrophoresis, Photosynthesis measuring system (IRGA), Capillary electrophoresis, DNA sequencer, Controlled temperature ultra centrifuges, Freeze dryer, Cryobank, Stereo and light microscopes, Biological oxidizer, Elisa readers, etc. A well-stocked Library is linked with the National Library of Biological Sciences through wide area network.

The research programs include: Development of new gene pool and varieties of crops; Crop protection through pest management and disease control; Fertilizer and water management for major crops; Abiotic stress management; Sustainable use of salt-affected waste-land and saline water for plant production, and improving health, nutrition and reproduction of livestock.

## Background

Abiotic stresses such as drought, salinity, extremes in temperatures, heavy metals and radiation, etc. are the most important limiting factors for plant productivity. Due to which food, feed and raw material requirements of ever growing world population cannot be met. To overcome these limitations and for improvement in crop productivity, stress tolerant crop varieties have to be developed. NIAB scientists have developed technologies which can successfully be utilized to identify stress tolerant germplasm at seedling or mature stages. Using physiological, biochemical,

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Carbon isotope discrimination (CID) and biotechnological techniques, high yielding stress tolerant crop cultivars can be developed. In addition, certain shotgun approaches can be developed through which stress tolerance potential of crops can be increased.

## Objectives

The objective of the course is to disseminate the knowledge and to provide training to utilize different techniques and equipments to estimate the stress tolerance in crop plants. The purpose of proposed training is to improve the scientific vision of young scientists and enhancing interaction and sharing of experiences between relevant research institutes in the country.

## Eligibility

Young teachers/researchers having a university degree, who are actively involved or opt for a career in plant breeding for stress tolerance and in plant stress management.

## How to apply?

Please send the Application Form along with demand draft of course fee in the name of Head, LAO, NIAB, Faisalabad, Pakistan through our Institute. Application should reach the Organizing Committee upto 28<sup>th</sup> February, 2017.

## Course Fee

Professionals: Rs.3000/-

Students: Rs. 2000/-

## Outline of Training Program

### A. Screening

- Drought tolerance: Cell membrane stability, and other physiological indices
- Salt tolerance: Germination, plant height, root, shoot and biomass stress tolerance indices and K/Na ratio criteria

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- High temperature or heat stress tolerance: Cell membrane thermo-stability and physiological attributes

- Screening for high water use efficiency (WUE) Using <sup>13</sup>Cisotope discrimination technique

## B. Stress Physiology and Biology

- Determination of water relations through relative water contents (RWC), excised leaf water loss, water potential by Pressure Chamber, Osmotic potential using osmometer and turgor potential etc.

- Photosynthetic efficiency, by IRGA and Porometer

- Temperature changes through infra red thermometer and its relation with plant canopy processes

## C. Molecular Techniques

PAGE, PCR, RAPD, Molecular basis of stress tolerance, Marker assisted breeding for stress tolerance

## D. Field Training

- Demonstration/practical for screening in pots, lysimeter tanks, field conditions

- Seed testing (viability and germination, dormancy, and seed treatments for breaking dormancy and improved germination percentage and rate)

- Nursery raising: Methodology from seed to seedlings ready for field planting

- Planting Techniques: Land preparation and sowing methods (for crops), and Ditches / Furrows or Ridges/mounds (for trees and shrubs)

## E. Water-Use Efficiency

- Techniques for soil moisture determination (Neutron moisture probe)

- Irrigation Methods (flood, drip, sprinkler, etc.)

- Transpiration measurements:

- Single leaf (porometry) and whole plant (Heat Pulse Technique)

## F. Field Visit

Visit to Biosaline Research Station, Pakka Anna

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