

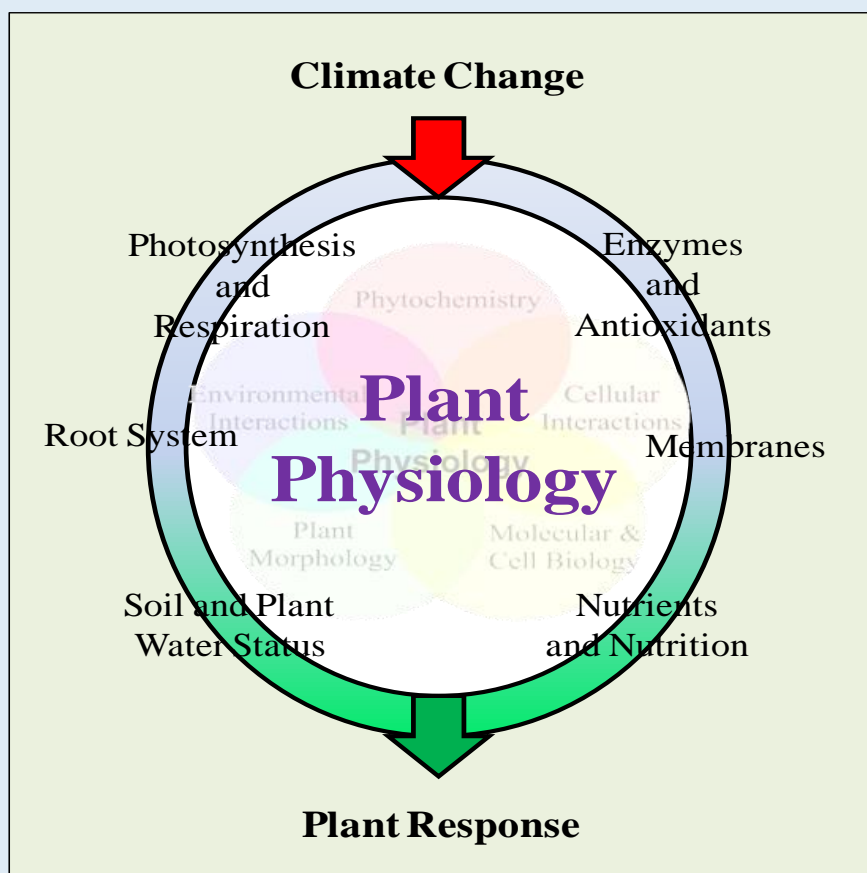


ICAR Sponsored Training Programme for Technical Staff of ICAR Institutes



Physiological Techniques to Analyze the Impact of Climate Change on Crop Plants

(16-25 January, 2017)



Organized by

Division of Plant Physiology
ICAR-Indian Agricultural Research Institute (IARI)
New Delhi – 110 012

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Physiological Techniques to Analyze the Impact of Climate Change on Crop Plants

About the Institute and Division of Plant Physiology

The Indian Agricultural Research Institute (IARI) is the country's premier institution for agricultural research, education and extension. It has been serving the cause of science and society with distinction through basic research, generation of appropriate technologies and development of human resources. The Division of Plant Physiology, a constituent of School of Basic Sciences of IARI, was established in the year 1966. The mandates of the Division are to conduct basic and strategic research with a view to understand the processes leading to solution of problems in crop productivity, to train Post-Graduate students leading to M.Sc. and Ph.D. degree and to impart training in physiological tools to agricultural scientists of SAUs/ICAR Institutes. Presently, research thrust area of the Division is Deciphering Physiological, Biochemical and Molecular Mechanisms of Abiotic Stress Tolerance and Nutrient Use Efficiency of Crop Plants. It has four objectives 1) Identification of donors, mechanisms and component traits for nutrient use efficiency (NUE) and tolerance to drought and heat stresses in rice and wheat, 2) Functional genomics for identifications of promoters, genes and epialleles associated with abiotic stress tolerance and nutrient use efficiency of rice and wheat, 3) Development of transgenic rice and wheat for enhancing abiotic stress tolerance and 4) Development of microbe based crop management strategies to enhance physiological efficiencies under abiotic stress.

Introduction

Crop yield under abiotic stress environments needs to be increased in order to meet the growing demands for food, feed, fodder, fibre and fuel security. Global climate change is expected to pose hindrances in this direction. To address the issue of global climate change and its impact on crop productivity/crop ecology better understanding of physiology at crop level is needed. Besides this, role and significance of different physiological parameters in relation to climate change and thereby the ability of the crop plants to sustain the alterations in climatic variables is the need of today. In this direction, rapid progress and gradual refinements in plant phenotyping and methods for phenotyping is expected to give desirable results in future. All these aspects emphasize on the importance and significance of different physiological parameters and the need to understand and apply physiological techniques in analyzing the impact of climate change on crop plants.

Theme

Understanding the significance of different physiological parameters has immense importance in studies on crops under changing climate. Thus there is emerging need of proper of associated physiological parameters. Understanding and application of physiological parameters for crop improvement in relation to climate change has emerged as a broad area wherein different disciplines can contribute by studying appropriate physiological processes and plant responses. This training aims to impart training on different physiological techniques to analyze the impact of climate change on crop plants.

Objectives

Training will give an opportunity to technical staff working in ICAR institutes to gain updated information and hands on about different physiological techniques to analyze the impact of climate change on crop plants.

Training will be conducted to achieve the following objectives:

1. To impart basic understanding of different physiological parameters and their relevance in the scenario of climate change.
2. To inculcate skill towards the measurement and analysis of different physiological parameters.
3. To provide logical interpretation of results and possibility of integrating physiological parameters with other biochemical/molecular investigations.

Venue

The venue of the training is Division of Plant Physiology, ICAR- Indian Agricultural Research Institute (IARI), New Delhi - 110 012

Duration of the Training

Training has been planned for the duration of 10 days, **from 16 - 25 January, 2016.**

Weather Conditions

Delhi is well connected through air, railways and roads with different parts of the country. IARI, commonly known as Pusa Institute, is centrally located in New Delhi. The weather during course duration will be winter season with day and night temperatures ranging between 16-22 °C and 5-10 °C, respectively. Weather is also expected to be foggy with mild rains. The applicants are therefore advised to come prepared with woollens to suit the need of the weather conditions.

About the Training

Course will cover different physiological parameters that can be used to assess the impact/effect of climate change (especially high temperature and drought stress) on crop plants. Both destructive as well as non-destructive parameters will be the part of this course. Hand on experience will be provided to candidates for each of the assessment techniques along with the information on background, reasoning and possible interpretations. Use of different instruments, their handling, precautions to be taken and guidelines for proper maintenance will also be emphasized in the course.

Contents of the Training

Training will consist of a blend of lectures, experiential learning/practicals, field visit/facility visit and discussion. Brief details of physiological parameters/techniques that will be covered in this 10 days training are as follows:

- Measurement of photosynthesis (along with related parameters) and respiration by IRGA
- Estimation of chlorophyll by destructive and non-destructive (SPAD) methods
- Measuring chlorophyll fluorescence and separation and estimation of pigments by TLC
- Measuring membrane stability index (MSI)
- Determining soil and plant water status (relative water content, water potential, tensiometer and TDR)
- Measurement of canopy temperature by IR thermometer and IR thermal imaging
- Method of measuring root system architecture (RSA) and related parameters
- Solution preparation and assay of nitrate reductase (NR) activity
- Assay of antioxidant enzymes (SOD, peroxidase)
- Measurement of stomatal density and stomatal index
- Sampling techniques and methods of digestion of plant samples
- Measuring micronutrients in plants
- Hydroponic culture as screening techniques for abiotic stresses
- Lab visits and interaction with faculty and staff in Division of Plant Physiology at IARI
- Visit to phytotron, phenomics, FACE and OTC facilities

Eligibility and Selection Criteria

Active technical staff of ICAR who are working in the related area and actually interested in making use of physiological techniques at their parent institute **can apply in prescribed format (see below)**. Preferably, one technical staff will be considered from an institute. A total 20 applicants (including 5 from IARI itself) will be selected for this course. The selection of the applicant will be made as per the guidelines of ICAR.

How to Apply?

The application as per the given format (see below), complete in all respects and duly signed and forwarded by the employer/competent authority should reach to the Programme Director on below mentioned address *via* Registered Post/Speed Post. Applicant can however also submit an advance copy of the application (soft copy, *via* E mail) to the Programme Director. Finally, the application duly signed and forwarded by the competent authority will be considered for selection purpose.

Boarding and Lodging

Boarding and lodging will be arranged for the participants during the period (from 15 to 26 January, 2017) within the IARI campus. The accommodation arranged by the organizers will be on sharing basis. Charges for the accommodation and food (except session tea and lunch) will be borne by participant. The cash memo will be provided to the participants for making claim from their respective Institutes. The applicants are however free to arrange for accommodation at their own level, if they wish so, in the hotels nearby the IARI campus or as per their convenience.

TA/DA

TA/DA of the admitted participants has to be borne by their Institute and IARI will have no liability on this account.

Financial Liability

- Organizing institute will provide only session tea, working lunch, drinking water, study material (preferably in soft copy) and registration kit to the participants from the HRD fund. Rest of the expenditure has to be borne by the Institute of the participants including TA/DA.
- Charges for accommodation and food (including breakfast, lunch, evening tea and dinner) will be borne by each participant and they can then get the claim from their respective Institutes (out of HRD fund). Bill for accommodation and food charges will be provided to the participants.

Important Dates

Last date for receipt of application duly forwarded by Competent Authority: **December 10, 2016**
Intimation/issue of admission letter to selected applicants (*via* E mail only): **December 15, 2016**

This Brochure is also available at
IARI website (<http://www.iari.res.in>) and ICAR website (<http://www.icar.org.in>)

All Correspondences May Kindly Be Addressed To:-

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Programme Director

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APPLICATION FORM

ICAR Sponsored Training Programme for Technical Staff of ICAR Institutes
Physiological Techniques to Analyze the Impact of Climate Change on Crop Plants
(16-25 January, 2017)

1. Full name (in block letters) :
2. Designation :
3. Present employer & address :
4. Address for communication :
5. Telephone : Office: Resi: Mobile:
6. E-mail :
7. Permanent address :
8. Date of birth :
9. Sex (Male/Female) : Marital status(Married/Unmarried):
10. Details of educational qualification:
11. Details of working experience (during last five years):
12. Details of present work/activity involved in:
13. Courses/Trainings attended (during the last three years):
14. Number and type of publications (if any):
15. How this training will be useful to you/your department/institute? :
16. Any other information:

Signature of the applicant

CERTIFICATE

It is certified that information furnished has been verified and found correct.

Recommendation of the forwarding Authority/Institution

Signature of the Competent Authority
With official seal

Date:

Place:

To

Dr. Vijay Paul

Programme Director

Division of Plant Physiology, Room No. 214,

ICAR-Indian Agricultural Research Institute (IARI),

New Delhi -110 012

*[Last date for receipt of application duly forwarded by the competent authority: **December 10, 2016**]*