Short Course

Training

on

" **Crop Modeling to improve resource use efficiency under temperate conditions**."

7th October to 16th October 2017

Course Director
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Course Co-ordinator

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Professor Agronomy   Assistant Professor

Sponsored by

Indian Council of Agricultural Research,

New Delhi

Organized by
Division of Agronomy,
Faculty of Agriculture,
Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir
Wadura, Sopore- 193 201 (J&K)

Introduction

Indian Agriculture is known for its multi-functionalities of providing food, employment, nutritional and ecological securities. Crop yield is the culmination of a diversified range of factors such as soil, seed, pests, diseases, fertilizers and agronomic practices. Efficient management of available resources with variable weather conditions is essential to increase productivity of agriculture. In addition to this, the focus on agricultural production is changing from quantity to quality in recent years. In the context of climate change, soil carbon sequestration, long-term food security and environmental sustainability have become important issues. To arrive at suitable solution for these new challenges, consideration of numerous components which interact with plant growth and development is of paramount importance. Traditionally, agronomic experiments are conducted at a particular point of time and space, making results site and season-specific, time consuming and expensive. Field experiments to capture all the multi year and multi locational variability are nearly impossible.

Crop growth simulation models and biogeochemical and biophysical models have been very helpful in projecting the future crop and soil productivity. These models in connection with different GCM models predict the future agricultural practices that can adapt to different climate change scenarios. There are a few models that can be used for different scenario analysis to combat impact of climate change on agricultural production of the globe. Simulation models that are able to assess climate change impact on crop growth, yield and farm economy, still lack complete feedback structures. Only single aspects can be investigated. However, modelling these single aspects increase knowledge on to the aspects of expectations from climate change, if interpreted carefully and in the context of the model's abilities. Simulation models are widely used to address "what if" type questions, such as, what if the climate changes, different irrigation or fertilization regimes are used, different sowing dates are used, different cultivars are used, etc. In addressing actual yield predictions required by governments, private corporations, or NGOs, different types of simulation models are used for solving these "what if" type questions. Here, capabilities of different simulation models will be discussed in assessing the impact of climate change on agro ecosystem and the possible mitigation and adaptation methods.

In this context, a short course training entitled "Crop Modeling to improve Resource use efficiency under temperate conditions" is scheduled with the following objectives

1. To acquaint with calibration of various Decision Support System Tools
2. To understand the accuracy of the simulation models and their validation.
3. To acquaint with crop simulation models, their applications to make strategic and tactical decisions on irrigation, nutrient management, sowing window , and mitigation etc.
4. To understand the impacts of climate change on agriculture and the possible solutions.

Course Outline

1   Application of Crop Simulation Models in Agriculture
2   Crop models and crop weather relationship
3   Importance of Agromet Advisory in agriculture
4   DSSAT file system-Input files, Experimental , Weather file, etc
5   Application of DSSAT models for climate resilient agriculture
6   Introduction to INFOCROP
7   Importance of INFOCROP
8   Hands on INFOCROP
9   Introduction to APSIM
10 Special lecture on Concepts of system approach and Growth modelling

Course Overview

The ultimate goal of the program is to describe a practical approach for integrating the effects of soil, weather, management and genetic factors for sustainable crop production. Use of crop simulation models for crop growth and development,

water use, nutrients, resources etc.and the procedures for collecting and managing crop, weather and soil data for application of models for various purposes in agriculture shall be discussed. Applications of Decision Support System Tools for studying water and nutrient management and adaptation to climate change and hands-on assignments using the DSSAT, INFOCROP, APSIM, GIS, and RS software package shall be emphasized.

Eligibility

Participants from SAU's/ICAR Institutes/ KVKs etc. in the cadre of Assistant Professors or equivalent and above from Agronomy/ Soil Science/ Agro meteorology/ Crop Physiology/ Agril. Entomology/ Plant Pathology /Plant Breeding/ Vegetable Science/ Horticulture/ Agro forestry etc. are eligible. The number of participants for the program is limited to 25. Only 10 % internal participants are permitted.

Venue

Main Campus, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Shalimar, Sringar-190 025 (J&K).

About the Venue

The venue of training is at Shalimar campus situated at north-east embankment of world famous lake (Dal) and near Mughal Garden, Shalimar at the foot of Zabarwan hills. The climate of the site during scheduled training program is pleasant. Average temperature ranges between 17-28 ^{0} C. Rains may result in dipping of temperature. So, participants are advised to bring light warm clothes alongwith. The venue has world famous Mughal gardens(Nishat, Shalimar, Harvan, Cheshmashahi) in close proximity.Famous tourist places like Gulmarg (70 Km), Sonmarg (110 Km), Pahalgam (100 Km), Yusmarg (80 Km) are also accessible.

Travel

The participants will be paid for to and fro journey, restricted to AC-III-tier train fare or bus. Actual TA will be paid on production of tickets by the participants. TA will be paid from the place of duty to the course location and back by the shortest route. **Participants are requested not to bring any family members along with them.** They are expected to make their own arrangements to reach the university guest house. City transport service is available to reach the university. Participants are advised to make their return journey reservations at their end before leaving for Srinagar. Due to unavailability of train link from Jammu to Srinagar, participants will be paid shared taxi fare like Tata Sumo/ Tavera/ Zylo / Innova etc. frequently available at taxi stands of Jammu and Srinagar. Participants should ask for ticket to drivers of vehicle which are necessary for reimbursement of TA.

Accommodation

Boarding and lodging will be arranged for the participants in the university guest house. Local participants are not eligible for boarding and lodging, however, local hospitality *i.e.* working lunch, tea, *etc.* will be provided.

Location

University campus is located 12 km from TRC / Dal Gate and 25.0 km from airport. Local vehicle services are frequently available from all these places to reach the venue.

Course duration

The duration of training program is 10 days from 1st August to 10th August, 2017. Participants should attend the training program with their **own laptops and a data set of (daily weather, soil and crop) at least 2 to 3 years for hands on training.** All the participants are expected to arrive latest by the evening of 31st July, 2017 and can leave after 4.30pm on 10th August, 2017.

Application and Selection

As per the ICAR instructions, the interested candidates should register and apply online through 'Capacity Building Program' (CBP) portal as follows:
1. Visit the website http://www.iasri.res.in/cbp/ or click on Capacity Building Program link under http://www.icar.org.in

2. Login using your user ID and Password. To create user ID use "Create New Account" link.
3. After login, click on "Participate in Training" link and fill the Proforma.
4. Duly signed scanned copy of application should be uploaded through the above portal or sent to the Course Director by post along with registration fee. The last date for receiving the nomination is 30th June, 2017. The advance scanned copy of the nomination may be sent by email.

Note: Candidates will be informed of their selection before 10th July,2017.

Registration fee

The participants are required to pay the sum of Rs.50/- (Rupees fifty only) towards registration fee (non-refundable) in favor of "Head, Division of Agronomy, Faculty of Agriculture, SKUAST Kashmir, in the form of bank draft or postal order.

For Correspondence

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