ICAR Sponsored Short Course

[10 Days: 18th to 27th March, 2026]

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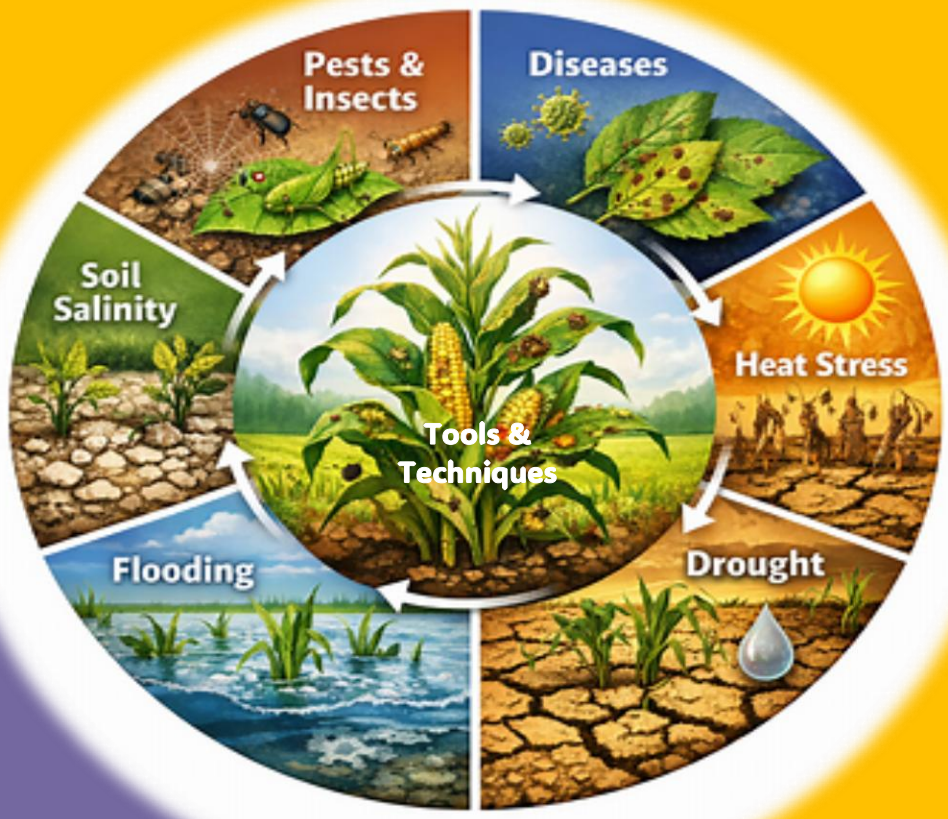
Climate-Smart Agriculture: Tools and Techniques for Biotic and Abiotic Stress Management



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Course Director

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Sponsored by
Agricultural Education Division
Indian Council of Agricultural Research

Organized by
Department of Genetics & Plant Breeding, School of Agricultural Sciences, Nagaland University, Medziphema Campus, Nagaland-797 106

Background

Agriculture is increasingly vulnerable to the impacts of climate change, which poses serious challenges to food production and the livelihoods of farmers. Rising temperatures, irregular rainfall patterns, and the increasing frequency of extreme weather events such as droughts, floods, and heat waves have intensified both **biotic stresses** (pests, diseases, and weeds) and **abiotic stresses** (drought, salinity, temperature extremes, and nutrient imbalances) affecting crops. These stresses significantly reduce crop productivity, threaten food security, and negatively impact the sustainability of agricultural systems. In this context, **Climate-Smart Agriculture (CSA)** has emerged as an important approach to address the dual challenges of climate change and agricultural productivity. CSA focuses on improving farm productivity, strengthening resilience to climate variability, and promoting environmentally sustainable agricultural practices. It integrates innovative tools and techniques such as climate-resilient crop varieties, integrated pest management, efficient irrigation systems, soil health management, conservation agriculture, and the use of climate information services. This training on **"Climate-Smart Agriculture: Tools and Techniques for Biotic and Abiotic Stress Management"** aims to build awareness and enhance the capacity of participants to adopt climate-resilient agricultural practices. The training will focus on practical strategies and modern technologies that can help reduce crop losses, improve resource-use efficiency, and support sustainable agricultural development under changing climatic conditions.

Objectives

- **Enhance Knowledge on Climate-Smart Agriculture:** To increase participants' understanding of climate-smart agricultural practices and their role in sustainable farming under changing climatic conditions.
- **Build Capacity to Identify Biotic and Abiotic Stresses:** To train participants to recognize and assess major biotic stresses (pests, diseases, weeds) and abiotic stresses (drought, salinity, heat, floods, and nutrient deficiencies) affecting crops.
- **Promote Adoption of Stress Management Techniques:** To introduce effective tools and techniques such as integrated pest management, biological control, resistant crop varieties, efficient irrigation systems, and soil management practices.
- **Improve Decision-Making Skills:** To equip agricultural professionals with knowledge of weather forecasting, climate information, and digital decision-support tools for better farm management.
- **Encourage Sustainable Resource Use:** To promote efficient use of natural resources such as soil and water through conservation agriculture, mulching, and improved nutrient management.
- **Strengthen Climate Resilience in Farming Systems:** To help participants develop strategies that increase the adaptability and resilience of agricultural systems to climate variability and extreme weather events.
- **Support Sustainable Agricultural Development:** To contribute to improved productivity, environmental protection, and long-term food security through the adoption of climate-smart practices.

Course outline

Module 1: Introduction to Climate Change and Agriculture
- Overview of climate change and its impact on agriculture
- Changing weather patterns and extreme climatic events
- Effects on crop productivity and farming livelihoods

Module 2: Concept and Principles of Climate-Smart Agriculture (CSA)
- Key pillars of CSA: productivity, adaptation, and mitigation
- Importance of CSA in sustainable agricultural development

Module 3: Understanding Biotic Stresses in Crops
- Types of biotic stresses: pests, diseases, and weeds
- Impact of biotic stresses on crop growth and yield
- Monitoring and early detection of pests and diseases

Module 4: Tools and Techniques for Biotic Stress Management
- Integrated Pest Management (IPM) practices
- Use of biological control agents
- Pest- and disease-resistant crop varieties
- Safe and judicious use of pesticides

Module 5: Understanding Abiotic Stresses in Agriculture
- Types of abiotic stresses: drought, salinity, heat, floods, and nutrient deficiencies
- Effects of abiotic stresses on crop physiology and productivity

Module 6: Tools and Techniques for Abiotic Stress Management
- Climate-resilient and stress-tolerant crop varieties
- Efficient irrigation methods (drip and sprinkler systems)
- Soil health management and balanced nutrient application
- Mulching and conservation agriculture practices

Module 7: Climate Information and Decision-Support Tools
- Use of weather forecasting and climate advisories
- Digital tools and mobile-based agricultural services
- Decision-making for climate-resilient farm management

Module 8: Practical Demonstrations and Field Exposure
- Demonstration of CSA practices in the field
- Hands-on training on stress management techniques
- Case studies and success stories

Module 9: Group Discussion and Action Planning
- Identifying local climate challenges
- Developing farm-level strategies for CSA adoption

Module 10: Evaluation and Feedback
- Review of key learning outcomes
- Participant feedback and training evaluation

Venue, Date and Duration of course

Venue: Conference Hall, Department of Genetics and Plant Breeding, School of Agricultural Sciences, Nagaland University, Medziphema Campus, Nagaland- 797 106
Date: 18th to 27th March, 2026
Duration of course: 10 Days

Eligibility

The Programme is designed for Scientists/ Assistant Professors/ Associate Professor/ Ph.D. Scholars/Research Associate/ Research Assistants/ YP-II/ SRF/ SMS working in Agriculture and Allied Sciences.

Important Date

Last Date of registration in Google Form: **16/03/2026**

Intimation of selection of participant: **16/03/2026**

Confirmation by participant: **17/03/2026**

Registration form

Interested applicants are required to fill the registration form (online) using the link given here,

Link for registration: https://forms.gle/cHJcQxH1ZozgXodx5

Travel, Boarding and Lodging

The selected participants are eligible to travel by their entitled class (Not above AC II train) or by bus in shortest route. Actual TA will be reimbursed on production of original certificate and tickets by the participants. The tickets have to booked through IRCTC website. Free boarding and lodging will be provided to the participants within the budgetary provision as per ICAR norms. The local participants are not eligible for boarding and lodging, however working lunch and refreshments will be provided. No accompanying person will be allowed.

About Institute

Nagaland University is a Central University established in the state of Nagaland by an Act of Parliament by the Government of India in 1989. The headquarter is at Lumami, Zunheboto with other campuses at Kohima and Medziphema. School of Agricultural Sciences (SAS), is located at Medziphema, which is around 25 Km from the Commercial Capital of Nagaland (Dimapur), 20 Km form Dimapur Airport and 50 Km from the State Capital (Kohima). This houses 13 departments and caters to around 1000 Under-Graduate, Post-Graduate and Doctorols students, and Research Scholars with mandate of teaching, research and extension.

Application form

Name of Applicant:……

Designation:……

Discipline:……...

Email ID:……....

Mobile No. with WhatsApp:……..

Affiliation/ Institute Name with Address:……
……...

Permanent Address:……
……..

Correspondence Address:……
……..…

Research Experience:……,,,,……

Do you have attended any short course earlier. If yes, give details:……

Signature of applicant

Signature of recommending authority with seal

Contact details (if needed)

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