National Seminar

on

Agrophysical Innovations for Atmanirbhar Bharat (AIAB)

January 21-23, 2027

(Thursday-Saturday)

Jointly Organized by

The Indian Society of Agrophysics, New Delhi

&

ICAR – National Bureau of Soil Survey & Land Use Planning (NBSS & LUP), Nagpur, Maharashtra



BACKGROUND

Agriculture is undergoing a significant transformation driven by emerging scientific innovations, technological advancements & the growing need for sustainable management of natural resources. In the context of India's vision of Atmanirbhar Bharat, strengthening agricultural self-reliance requires the integration of scientific knowledge, indigenous technologies & innovative approaches to enhance productivity, resource-use efficiency, climate resilience and environmental sustainability. Agrophysics, an interdisciplinary field integrating soil physics, plant biophysics, micrometeorology, hydrology and geospatial sciences, plays a pivotal role in understanding and managing the complex interactions among soil, water, plants and the atmosphere. With increasing challenges from climate change, land degradation, declining soil health, water scarcity, and growing food demand, there is an urgent need to develop innovative, science-based solutions for sustainable agricultural development. Recent advancements in remote sensing, geographical information systems (GIS), spectroscopy, digital soil mapping, artificial intelligence (AI), machine learning (ML), sensor-based technologies & simulation modelling have opened new avenues for precise assessment, monitoring and management of agricultural resources. These technologies can facilitate data-driven decision-making, precision agriculture, efficient soil and water management, climate-smart farming, and sustainable intensification of agricultural production. Equally important is understanding fundamental soil physical processes, pedological development, soil–water–plant interactions, land degradation mechanisms, and ecosystem functions. Integrating these fundamental processes with modern digital & computational technologies can provide effective strategies for improving soil health, assessing land resources, restoring degraded ecosystems, and supporting carbon sequestration & climate change adaptation and mitigation. Such innovations are essential for developing resilient agricultural systems while ensuring the long-term sustainability of natural resources. In this context, the Indian Society of Agrophysics in collaboration with ICAR – National Bureau of Soil Survey and Land Use Planning is organizing the National Seminar on "Agrophysical Innovations for Atmanirbhar Bharat (AIAB)" at ICAR–National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), Nagpur, Maharashtra, India, during January 21–23, 2027. The seminar aims to provide a national platform for scientists, academicians, researchers, students, policymakers, industry professionals & other stakeholders to share recent research findings, exchange innovative ideas & deliberate on emerging developments in agrophysics and their applications in Indian agriculture. The seminar is expected to foster interdisciplinary collaboration, promote scientific networking and identify emerging research priorities and technological opportunities for Indian agriculture. Ultimately, it seeks to strengthen the role of agrophysical research & innovations in building a productive, resource-efficient, climate-resilient and self-reliant agricultural sector, contributing meaningfully to the vision of Atmanirbhar Bharat.

SEMINAR FEATURES

- The 13th Dr. B. P. Ghildyal Memorial Lecture
- Special Session by International Water Management Institute (IWMI)
- Special Session by The Fertilizer Association of India, New Delhi
- Presentation on "Dr. Shibendu Shankar Ray Best Doctoral Thesis Award"

Research Areas For Which Abstracts Can Be Submitted:

Theme 1. Soil Physics, Pedological Development & Soil–Plant–Water Interactions

- Soil physical properties, soil structure and their influence on crop growth and productivity.
- Pedogenesis, pedological development, soil formation processes & landscape–soil relationships.
- Soil–water–plant–atmosphere interactions, water movement and transport of heat, sediments and solutes.
- Soil hydraulic properties, soil moisture dynamics, root water uptake & 3D characterization of soil structure.

Theme 2. Soil Health, Land Degradation Assessment & Sustainable Land Management

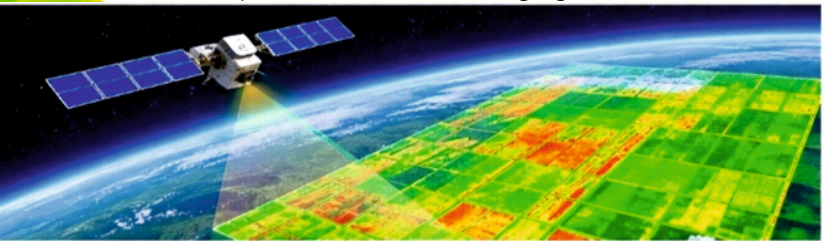
- Soil health and quality assessment through physical, chemical and biological indicators.
- Assessment, monitoring and mapping of land degradation, soil erosion, salinization and desertification.
- Soil and water conservation, land restoration and management of degraded and problem soils.
- Impact of land-use changes and agricultural management practices on soil properties, productivity and ecosystem functions.

Theme 3. Geospatial Technologies, Remote Sensing & Digital Soil Mapping

- Remote sensing and GIS applications in land-use/land-cover mapping and agricultural resource assessment.
- Digital soil mapping, geostatistics and spatial variability analysis for parcel-level land-use planning.
- Multispectral, hyperspectral, microwave, thermal and spectroscopy-based assessment of soil and crop resources.
- UAV/drone-based remote sensing, LAI estimation, crop monitoring and remote sensing-based crop insurance.

Theme 4. Agrometeorology, Climate Change and Agricultural Resilience

- Crop–weather interactions, agrometeorological forecasting and weather-based crop yield estimation.
- Climate change impacts, adaptation and mitigation strategies for sustainable agricultural production.
- Agricultural drought monitoring, forecasting, extreme weather events and climate risk management.
- Weather-based pest and disease forecasting, agroadvisories and climate-resilient farming systems.





Theme 5. Data-Driven Soil Intelligence Using AI, ML & Smart Technologies

- Artificial intelligence, machine learning and deep learning applications in soil characterization and soil property prediction.
- Big data analytics, digital soil intelligence and AI-based decision-support systems for agricultural resource management and digital technologies for post-harvest management and reduction of agricultural losses.
- Integration of remote sensing, GIS, spectroscopy, IoT and sensor networks for real-time soil and crop monitoring.
- Digital twins, predictive modelling, robotics and smart technologies for next-generation agriculture

Theme 6. Simulation Modelling, Plant Biophysics and Precision Agriculture

- Simulation modelling of crop growth, development, productivity and yield under variable environmental conditions.
- Modelling of soil water balance, crop water requirements and root water uptake.
- Plant biophysics and fibre physics, thermal imaging and spectral techniques for monitoring crop growth and abiotic stress.
- Precision farming, site-specific nutrient management (SSNM), variable-rate technology (VRT) and sensor-based precision irrigation.

Theme 7. Smart Water Management, Nanotechnology and Emerging Agricultural Technologies

- Smart irrigation technologies, real-time soil moisture monitoring and efficient agricultural water management.
- Wireless sensor networks, advanced sensors and automated irrigation and fertigation systems.
- Nanotechnology and nanomaterials for efficient nutrient delivery, water management and sustainable crop production.
- Emerging technologies for water-use efficiency, resource optimization for Atmanirbhar agriculture.

Theme 8. Climate-Smart Agriculture, Carbon Management and Ecosystem Services

- Conservation agriculture, organic farming and sustainable soil health management practices.
- Soil carbon sequestration, greenhouse gas emissions, carbon accounting and carbon credit generation under different land management practices.
- Ecosystem services, soil biodiversity and ecological sustainability of agricultural landscapes.
- Integrated natural resource management, climate-smart agriculture and sustainable agroecosystem development.

VENUE

ICAR-National Bureau of Soil Survey and Land Use Planning, Nagpur - 440033

REGISTRATION FEES

Member and Non-members:	Rs. 6000/-
RA/SRF:	Rs. 3000/-
Students:	Rs. 2000/-



Registration fee is to be paid in advance by each delegate to the Secretary, Indian Society of Agrophysics, Division of Agricultural Physics, NRL Building, ICAR-Indian Agricultural Research Institute, Pusa Campus, New Delhi - 110012, in the form of a bank draft drawn in favour of "Indian Society of Agrophysics" and payable at any bank in New Delhi so as to reach the ISAP headquarters by 30th December 2026 or the registration fee may also be paid by direct online bank transfer :-

Beneficiary Name: Indian Society of Agrophysics

A/C No. : 90292010026182

IFSC Code: CNRB0019029

Branch Code : 9029

Bank : Canara Bank

Branch : Pusa Campus, IARI, New Delhi - 110012

You Can pay registration fee using the BHIM QR or using UPI ID 8595897833@upi

Registration fee, once paid, will neither be refunded nor transferred to any other purpose or person.

Abstract Submission :-

Abstracts of original research papers on any of the above-mentioned topics are invited for ORAL/POSTER presentation in the National Seminar. Each abstract is to be a self-contained one, prepared in not more than 300 words, stating the objective(s), methodology and major findings briefly. Table(s), figure (s) or illustrations will not be accepted. Presentation of an abstract in an oral session will be allowed only when the abstract has been accepted for oral presentation, and one of the authors deposits the Registration fee with the Society office at New Delhi on or before the due date. Poster sessions will also be arranged. Only those abstracts which are received by the due date and presented during the Convention will be post-printed electronically. Abstract can be submitted through **https://www.agrophysics.in or it can be mailed to secretary.agrophysics@gmail.com.**



Important Dates

Last date for submission of abstract:	**31st December, 2026**
Date of issuing acceptance:	**10th January, 2027**
Last date of registration:	**15th January, 2027**

Awards

- Fellow, The Indian Society of Agrophysics (2026)
- Dr Shibendu Shankar Ray Best Doctoral Thesis Award (2025-2026)

Accommodation

Due to limited availability, accommodation in Institute guest houses is only on a first-come, first-served basis. Booking in nearby hotels may be facilitated subject to payment of half tariff in advance along with the registration fee. Regarding accommodation and transportation, we will provide information and contact details on the society website soon.

Contacts Details

Local Organizing Convenor

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