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Meeting Report

Future-proofing the plantation sector for wellbeing and welfare: Insights from PLACROSYM XXVI

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Abstract

Although plantation crops occupy less than 5% of India's cultivated area, they contribute approximately 10% to the agricultural GDP and 14% to agricultural exports, underscoring their strategic role in the national economy and rural livelihoods. However, the sector faces escalating risks from climate change, biotic stresses, market volatility, and labor shortages. The 26th Plantation Crops Symposium (PLACROSYM XXVI) was organized at ICAR–CPCRI, Kasaragod, from 5–7 January 2026. The symposium convened scientists, policymakers, and industry stakeholders across seven technical sessions, four keynote addresses, and a high-level panel discussion titled "Plantation Crops Strategy for *Viksit Bharat*." Deliberations identified critical research priorities, including the development of climate-resilient genotypes through marker-assisted selection, the scaling of tissue culture protocols, and the integration of AI and geospatial tools for precision agriculture. Keynote sessions highlighted the urgent need for government-backed regulatory mechanisms for biocontrol products and the potential of carbon trading within plantation ecosystems. A major policy recommendation emerged for establishing a unified institutional mechanism, such as a single Plantation Board, to foster inter-crop synergy and strategic branding. The symposium concluded that achieving the "*Viksit Bharat* @ 2047" vision requires a transition toward technology-driven, market-oriented, and carbon-smart production systems. Strategic focus must remain on mechanization to reduce drudgery, enhancement of farmer income through integrated multi-crop systems, and the exploration of high-value nutraceuticals. This roadmap serves as a blueprint for ensuring the long-term resilience and global competitiveness of India's plantation sector.

Keywords: Plantation crops, Climate resilience, Precision agriculture, Carbon sequestration, Agricultural policy, Viksit Bharat

Introduction

Plantation crops such as coconut, arecanut, oil palm, palmyrah, cocoa, cashew, tea, coffee, rubber, and spices, though occupying less than 5 per cent of India's cultivated area, contribute nearly 10 per cent to agricultural GDP and account for over 14 per cent of agricultural exports (Government of India, 2023; FAO, 2024). This strongly highlights their strategic importance to the national economy, rural livelihoods, nutrition, and export earnings.

Despite their significance, the plantation sector faces long-term risks arising from climate change, emerging pest and disease outbreaks, market volatility, labour shortages, and natural resource degradation (IPCC, 2022). In this context, adoption of biological control to manage the pests and disease incidence in plantation crops and also the potential of carbon trading in plantation crops attains significance (Lal, 2004; FAO, 2020; Kumar & Singh, 2021). Against this backdrop, the 26th Edition of the Plantation Crops Symposium (PLACROSYM XXVI), themed "Future-Proofing the Plantation Sector for Wellbeing and Welfare", was organized at ICAR–Central Plantation Crops Research Institute, Kasaragod, from 5–7 January 2026 (ICAR–CPCRI, 2026).

The symposium served as a national platform for deliberation among scientists, academicians, policymakers, industry stakeholders, and progressive farmers to identify research priorities for the plantation sector toward 2047.

The theme emphasized the urgent need to prepare India's plantation crops sector to remain productive, resilient, sustainable, and socially relevant in the face of emerging challenges and opportunities. The event reflected the collective commitment of ICAR–Central Plantation Crops Research Institute, ICAR–Indian Institute of Oil Palm Research, ICAR–Directorate of Cashew Research, ICAR–Indian Institute of Spices Research, UPASI Tea Research Foundation, Central Coffee Research Institute, Rubber Research Institute of India, Coconut Development Board, and Spices Board towards innovation-led growth, sustainability, and farmer welfare, while charting a future-ready roadmap for the sector.

Technical sessions

The symposium was divided into seven technical sessions covering the topics: Genetic Resources and Breeding, Resource Use Efficiency and Production System for Climate Resilient (Lal 2004; ICAR–CPCRI, 2026), AI and Digital Tools, Diagnosis and Management of Biotic Stresses, Nutraceutical and Value Addition for Wealth and Health, Socioeconomic Empowerment and Flash Talk (Collard & Mackill, 2008; Zhang & Kovacs, 2012; Sharma *et al.,* 2019). The sessions discussed critical issues viz., phenotyping and genotyping for developing climate resilient, pest and disease tolerant (Pretty & Bharucha, 2015) and industry processable varieties and hybrids across the crops; strengthening multi-institutional collaboration to standardize and scale up tissue culture protocols for coconut, oil palm, and rubber; development and promotion of climate-resilient agro-technologies in plantation crops (Sakbayeva *et al.,* 2025) and intensified research on carbon sequestration and carbon footprint assessment (Skrzypczak *et al.,* 2025); strengthening mechanization in harvesting and cultivation across plantation crops; the use of AI and digital tools for nutrient use efficiency, water use efficiency and precise harvest-stage identification and pests and disease management (Chen, 2025); strengthen multi-institutional collaboration to standardize innovative and biocontrol protocols for management of insect pests and diseases across plantation crops; soil and climatic parameters should also be considered for region-wise analysis of quality characteristics of plantation crops**;** use of advanced methods such as AI, GIS and other computational techniques for area estimation under different plantation crops for realistic assessment, policy formulation and sound planning; analytical tools such as Livelihood Security Index (LSI), Empowerment Index and other robust methods are to be employed in future studies for assessing the impact/ effectiveness of techno-socio-economic interventions rather than relying on qualitative description of the impact of interventions; enhancement of farmers' income through integrated systems. Each session discussed current status of research, status of use of cutting- edge technologies, constraints etc. The session on Flash Talk, organized for young researchers across the plantation sectors, was highly interactive, intellectually stimulating, and significantly enriched the scientific deliberations and interdisciplinary outlook of the programme.

Keynote addresses

To gain deeper insights into recent advancements in critical areas, four keynote addresses were organized as part of the symposium, delivered by eminent experts from national institutions and organizations. The talk on 'Plant protection in India: present strengths, emerging risks and the way forward' highlighted that spurious bio-control products being sold at lower prices in the market are undermining the credibility and perceived quality of genuine products developed through scientific research (Banerjee & Krishnan, 2025). A need for the strong government-backed regulatory mechanism to ensure quality control and market integrity was articulated. The address also emphasized the need to adopt biological pest management on a community basis to achieve effective and sustainable control of pests and diseases (Pretty & Bharucha, 2015; Kumar & Singh, 2021). The talk on 'Role of geospatial technology for assessment and management of fruit and plantation crops' highlighted the immense potential of geospatial technologies, remote sensing, and GIS tools for the large-scale assessment, monitoring, and management of plantation crops and emphasized the need for more greater collaboration within a defined time frame between plantation crops institutes and the ISRO (Zhang & Kovacs, 2012). Similarly, the need to explore the carbon sequestration potential of plantation crops for carbon trading was highlighted in the talk entitled 'Potentials of carbon credit in Plantation crops' (Lal, 2004). The carbon sequestration potential of plantation crop ecosystems and their relevance in emerging carbon markets and its potential benefit to the farmers were discussed. The talk on 'Plantations: present status and way forward' underscored the need for establishing a unified institutional mechanism, such as a single Plantation Board, to foster synergy among plantation crops to ensure improved coordination, policy support, and market linkage. The presenter also highlighted the importance of strategic branding of the plantation products to enhance their marketing potential.

Panel discussion

A high-level panel discussion on "*Plantation Crops Strategy for Viksit Bharat*" featured Directors and representatives from ICAR institutes, commodity boards, research organizations, and industry bodies. The discussion focused on the current status, challenges, and future roadmaps for major plantation crops in India. The following common issues and strategic recommendations emerged across all plantation sectors and it was felt that the plantation sector must evolve to become globally competitive with higher productivity and better processing technologies; large area dominated by improved, high-yielding, climate-resilient varieties and hybrids, resilient to pests and diseases; widespread adoption of multi-crop and integrated farming systems; enabled by digital and precision agriculture tools (Awais *et al.,* 2025) a source of functional foods, nutraceuticals, and health supplements (Singh *et al.,* 2017); supported by a vibrant startup ecosystem producing high-value products for global markets; mechanised to significantly reduce drudgery and labour dependency; strongly linked with trade, policy frameworks, and global value chains.

Strategic priorities emerged from the symposium for plantation sector

Building on the extensive deliberations across technical sessions, keynote addresses, and panel discussions, a set of strategic priorities was identified to guide the future development of the plantation sector. These priorities reflect the collective consensus of researchers, policymakers, and industry stakeholders on addressing emerging challenges while leveraging new

opportunities. Emphasis has been placed on enhancing resilience, productivity, sustainability, and market competitiveness through science-based and policy-driven interventions. The following recommendations provide a comprehensive roadmap for strengthening the plantation sector in alignment with the vision of *Viksit Bharat* by 2047.

1. Evolving varieties with tolerance to drought, heat, flood, salinity, and emerging pests and diseases using advanced breeding tools including marker-assisted selection.
2. Establishment of nucleus seed gardens in public and private sectors for assured supply of quality planting material of improved varieties, supported by *in vitro* propagation and molecular approaches.
3. Policy support for diversified cropping systems to enhance productivity, resilience, and farmers' income.
4. Promotion of AI, sensors, site-specific nutrient management, sensor-based irrigation, and real-time diagnostics using biosensors and AI-based image analytics.
5. Strengthening research on carbon capture potential of plantation ecosystems and exploring carbon credit opportunities for farmers.
6. Fostering collaborations for development of tools and machinery to reduce drudgery in plantation operations.
7. Organizing Annual Plantation Crops Festival to create awareness about plantation crops, their value-added products, and their contribution to health and wellness.
8. Exploring opportunities for high-value products from both primary produce and by-products across plantation crops.
9. Development of attractive packaging, branding, and awareness campaigns highlighting the health, wellness, and medicinal properties of plantation products.

Conclusion

The symposium emphasized that achieving the vision of *Viksit Bharat* by 2047 requires transforming plantation crops into highly productive, technology-driven, market-oriented, and environmentally sustainable systems that enhance farmers' income while contributing to nutrition, health, and export growth. The deliberations clearly brought out that the future of the plantation sector must be anchored in climate resilience, quality planting material, digital and precision technologies, carbon-smart production systems, mechanisation, value addition, and strong policy convergence**.**

[A report on the 26th Edition of the Plantation Crops Symposium (PLACROSYM XXVI) held at ICAR-Central Plantation Crops Research Institute (ICAR-CPCRI), Kasaragod, Kerala, India, from Jan 05-07, 2026]

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