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EDITORIAL

In the present context agriculture is at its serious juncture, tackled by the interconnected confrontation of climate change, food and nutritional security, waning soil health, water shortage, biodiversity loss and growing pressure on natural resources. The rising incidence of climatic extremes, changing rainfall patterns and emerging environmental stresses underline the pressing call for to transform conventional agricultural practices into resilient, resource-efficient and environmentally sustainable production systems. In this context, soil health restoration, regenerative agriculture, integrated nutrient management, climate-resilient crop varieties, agroecological approaches and efficient water management have emerged as essential pillars of sustainable agricultural development. Simultaneously, advances in agricultural biotechnology, soil microbiome research, biofertilisers, biopesticides and biological approaches to nutrient management are opening new avenues for improving crop productivity while reducing environmental footprints. The union of artificial intelligence, machine learning, remote sensing and Internet of Things technologies is further redesigning agricultural research and extension by facilitating precision-based decisions, intelligent resource management and timely farmer advisories. However, the actual triumph of these innovations will depend on their methodical rationale, affordability, convenience and efficient conversion into realistic way outs for farming communities, particularly small and marginal farmers.

As we present the September issue, we reiterate the significance of interdisciplinary scientific research in dealing with up-and-coming agricultural and environmental challenges. The future of agriculture requires a holistic integration of soil science, crop science, biotechnology, environmental management and digital innovation, proped up by strong research–extension linkages and evidence-based policymaking. Equally important is the transition towards a circular bioeconomy through agricultural residue valorisation, waste-to-wealth technologies, carbon management and sustainable utilisation of biological resources. We hope that the contributions in this issue will stimulate meaningful scientific dialogue and provide new perspectives for building productive, climate-resilient and environmentally responsible agricultural systems with the final objectives of strengthening farming livelihoods and securing a sustainable prospect for generations to come.

Sincerely



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