# Preface

The rapid evolution of technological innovation, coupled with the increasing necessity for sustainable resource management, has created both profound challenges and transformative opportunities for global agricultural systems. In an era marked by climate variability and growing food security demands, agriculture must extend beyond traditional production methods by integrating precision technologies, bio-innovations, and advanced agro-processing. Fostering research and interdisciplinary collaboration is therefore essential to support agricultural practices that are resilient, sustainable, and future-ready.

It is an honour to present this Special Issue of the Pertanika Journal of Tropical and Agricultural Science (PJTAS), entitled "Advancing Sustainable Agriculture: Integrating Precision Technologies, Bio-Innovations, and Agro-Processing", under the theme "Smart and Resilient Agriculture". This collection brings together cutting-edge research and comprehensive studies that contribute significantly to advancing sustainable agricultural practices and food systems.

The contributions featured in this special issue address critical dimensions of modern agricultural science. Research on precision technologies and smart farming highlights the integration of digital tools, data-driven approaches, and automated systems to optimise input efficiency, crop monitoring, and yield prediction. Studies on bio-innovations explore sustainable crop protection, soil health management, and biological approaches to enhance crop resilience to biotic and abiotic stressors. Furthermore, articles on agro-processing and post-harvest technology emphasise the importance of value addition, waste reduction, and quality preservation in creating robust agri-food supply chains.

Collectively, these contributions demonstrate that achieving long-term sustainability in agriculture requires a holistic approach—combining technological precision, biological solutions, and efficient post-harvest processing. Such integrated strategies are key to building agricultural systems that are both environmentally sustainable and resilient against global challenges.

We sincerely appreciate all the authors for their valuable research contributions, the peer reviewers for their rigorous and constructive evaluations, and the Editorial Team of PJTAS for their unwavering support and dedication throughout

the preparation of this publication. We hope that this Special Issue serves as a valuable resource for researchers, practitioners, and policymakers, inspiring further innovation and collaboration toward smart and resilient agricultural systems.

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