



**The 11th ASIAN-AUSTRALASIAN CONFERENCE ON PRECISION AGRICULTURE
(ACPA 11)**

October 14-16, 2025 | Chiayi, TAIWAN

SPEAKER BIODATA FORM

Title: Prof

First Name: Manjeet Singh

Last Name: Makkar

Position: Dean and Professor

Organization: Punjab Agricultural University

Country: India

Brief career highlights (less than 250 words):



Prof Manjeet Singh, working as Dean, College of Agricultural Engineering and Technology at Punjab Agricultural university (India), Dynamic Professional with more than 29 years of experience including 6 years administrative experience. He has started a new School on Digital Innovations for Smart Agriculture in the University. Under R&D, total 30 machines/technologies designed and developed especially in the area of conservation/precision/sensor based agricultural machinery. Out of which, 22 machines/technologies recommended by the research evaluation committee of the university for commercialization and adoption of the farmers and 3 technologies were licensed to 126 manufacturers for their mass production. Total 18 numbers of externally funded research projects funded by World Bank, ICAR, SERB, DST, DoA&FW, Industries etc. including one mega project under NAIP were completed or in hand. Total 341 publications including 101 research papers in peer reviewed journals, 64 Books/Chapters/manuals/bulletins, 66 published in the proceedings of various national and international conferences/symposia etc. To protect the IPR issues, 5 innovative technologies have also been applied for granting of patent.

Decorated by many societies/organizations including National Societal Innovation Award- 2019 by NRDC, Team Award by Dr Gurdev Singh Khush Foundation for Advancement of Agricultural Sciences for the year 2019, Cash Award and Citation from Honorable Governor of Punjab in the year 2019. The Institution of Engineers (India), Kolkata nominated as Fellow of the AG Division in 2019. Indian Society of Agricultural Engineers (ISAE) conferred JYOTI AWARD in 2011 and Team Award in 2019.. Indian Society of Technical Education awarded for guiding best M.Tech Thesis in Agricultural Engineering in the year 2008. Award of honour during an "International Indo-US Workshop on Precision Agriculture Technologies & Techniques" by PAU, Ludhiana and Colorado State University, USA in the year 2011. Received Senior Professional Engineer Award as an Alumni of College of Technology and Engineering, Udaipur in 2016.

Attended 24 international conferences including 12 in different countries like USA, Canada, Japan, Russia, South Korea, New Zealand, China etc with the theme mainly in the area of precision agriculture through travel grants received from DST, SERB, AICTE etc.

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CURRENT STATUS AND POTENTIAL OF DIGITAL AGRICULTURE IN INDIA

Manjeet Singh

Dean, College of Agricultural Engineering and Technology
Punjab Agricultural university
Ludhiana (India)

*Corresponding Author : manjeetsingh_03@pau.edu and deancoet@pau.edu)

Abstract

Indian agriculture is facing multiple challenges, including climate change, resource depletion, low productivity growth, high post-harvest losses etc. To address these, a strong push toward digital and smart farming is underway. The Government of India has launched major initiatives such as the Digital Agriculture Mission, Digital India Programme, and targeted funding for AI, Machine Learning, and cyber security to support agricultural innovation.

The focus is on building Digital Public Infrastructure (Agristack, soil fertility maps, crop estimation surveys, and decision support systems) that can guide farmers, policymakers, and agribusinesses. Precision agriculture using IoT, drones, sensors, robotics, and AI-based models is being promoted to improve water use efficiency, optimize fertilizer application, predict yields, and detect crop stress or diseases early.

Institutions like Punjab Agricultural University (PAU) and ICAR research centers have developed and tested practical solutions, including precision irrigation systems, UAV-based monitoring, robotic cotton pickers, automated sprayers, intra-row weeding mechanisms, microclimate management in orchards, and AI-based fuel consumption prediction for tractors. These innovations are already saving water, energy, labor, and inputs, while increasing crop productivity and profitability.

At the national level, digital agriculture also integrates with green initiatives such as biogas plants, solar dryers, rooftop solar energy, and rainwater harvesting, ensuring environmental sustainability. Together, these strategies aim not only to raise farm incomes and productivity but also to create opportunities for rural employment, entrepreneurship, and climate-resilient farming in India.

Keywords: Digital Agriculture, Precision Agriculture, Sensors, UAVs etc.