

**Summary of the Proceedings and Recommendations of
The Third National Conference on Agro-Informatics and Precision Agriculture 2012
(AIPA 2012) held from 1-3 August 2012.**

1. Background

The Third National Conference on Agro Informatics and Precision Agriculture (AIPA 2012), was held from 1-3 August, 2012 at the International Institute of Information Technology (IIIT), Hyderabad. AIPA 2012 was organized by The Indian Society of Agricultural Information Technology (INSAIT), Dharwad, Karnataka, in collaboration with IIIT, Hyderabad and the University of Agricultural Sciences, Raichur, Karnataka. The conference was supported by International Society of Precision Agriculture (ISPA), USA.

The numerous developments in the important areas of agro-informatics and precision farming relevant in the present agricultural scenario were deliberated in the conference. The conference was attended by scientists, extension agencies and agribusiness institutions engaged in promoting the use of Information and Communication technologies (ICT) and precision agriculture (PA) technologies. The following themes were included in the conference: ICT for agricultural research, education and extension; ICT for agricultural supply chain management and marketing; ICT for Natural Resource Management; Precision crop production; Precision crop protection; Precision horticulture; Precision livestock management; Precision forestry; Geospatial technologies in PA; Sensor technologies and wireless sensor networks in precision agriculture; and Internet of Things (IOT) applications in agriculture. AIPA2012 has attracted 130 submissions for oral presentations. The technical committee has accepted only 56 submissions for oral presentation and 20 submissions as posters. The papers presented in this conference are included in the publication published by Allied Publishers Pvt./ Ltd.

2. Inaugural session

The conference was inaugurated by Sri Ponnala Lakshmaiah, Honorable Minister of Information Technology, Government of Andhra Pradesh. As a guest of honor, Sri V.Nagi Reddy, Vice-Chancellor, Acharya NG Ranga Agricultural University, Hyderabad and Principal Secretary (agriculture), Government of Andhra Pradesh delivered a message. Rajiv Khosla, Professor of Precision Agriculture & Extension Specialist, Department of Soil and Crop Sciences, Colorado State University, and President of ISPA, USA, delivered the Key Note Address and stressed the importance of carrying out cutting-edge agriculture research in India. The messages were also delivered by B.V. Patil, Vice-Chancellor, University of Agricultural Sciences, Raichur (UASR), Karnataka; V.C. Patil, President, Indian Society of Agriculture Information Technology; Rajeev Sangal, Director, IIIT, Hyderabad, India; Maj. Gen. Dr Raji Bagga, Chair, Local Arrangements, IIIT Hyderabad, India and P.Krishna Reddy, convener, AIPA2012.

3. Keynote talks

The following keynote talks were delivered during the conference.

- The first keynote talk entitled 'Precision Agriculture (PA) for Small Scale Production Systems' was delivered by Dr. Rajiv Khosla, Professor of Precision Agriculture & Extension specialist, Colorado State University, Colorado, USA. He opined that the concept of PA is relatively simple and does not mandate utilization of advanced technologies to practice precision agriculture. The form of PA practices may be different from one place to another place, depending on the creative mindset of farmers, practitioners, scientists, and consultants local to the area of interest. Number of such examples was dealt with in the presentation where farmers and practitioners have overcome the challenges and converted them in to opportunities by harnessing the global ICTs and developing local precision agriculture techniques suitable for their region, operation and resources.
- The second keynote talk entitled 'Status of Remote Sensing Applications and Precision Agriculture in India' was delivered by Dr. V.K. Dadhwal, Director, National Remote Sensing Centre, ISRO, India. He explained the status of Remote Sensing Applications and Precision Agriculture in India and stated that knowledgeable agricultural decision making and policy formulation are critical to global sustainable agricultural development, food security and economic prosperity. The potential of the Geo-ICT for dissemination of agro information, through Indian geo Portal, Bhuvan and its outreach activities for various stake holders was presented. Bhuvan not only allows dissemination of geospatial data but has linkage to community, individual location through mobile and unique capabilities.
- The third Keynote talk entitled 'The Roadmap from Internet of Things to Smart Agriculture: case studies on web of things' was delivered by Dr. Nick Sigrimis, Professor of Agricultural University of Athens, Athens, Greece. He said that we are now living in a world that is filled with various smart things- the internet of things. The Embedded Intelligence (EI) aims at revealing the individual behaviours, spatial contexts, as well as social patterns and urban dynamics by mining the digital traces left by people while interacting with internet of smart things (cameras, smart cars, smart cards, etc). In the agricultural sector, we add mining of existing technology (books, articles, blue prints) to generate ontologies for reasoning and making pro active decisions. Further he deliberated on the research history, characteristics, general architecture, major applications and research issues of EI and gave an example of IOT for Smart Irrigation. Understanding of smart agriculture by the scientific community is a necessity, because it is needed for nations to develop and adopt these emerging technologies.
- The fourth keynote talk entitled 'Laser based Plant Discrimination and Identification Techniques for Precision Agriculture' was delivered by Dr. Kamal Almeih, Professor and Director of the Electron Science Research Institute, Edith Cowan University, Australia was presented through Video-Conferencing. He

explained about design and development of novel advanced photonic based weed sensor prototype that captures and analyses spectral data for accurate discrimination and detection of weeds and crops. No commercial products are available today to discriminate accurately weeds from surrounding crops (green from green). His team has developed the prototype that enables spraying only weeds in situations including post emergent stages of crop growth. This prototype development is crucial for cost effective weed management that significantly improves the profitability in the agricultural sector. The other benefits include cost savings on herbicides, improvements in crop yield, combating herbicide resistance, reduction in water use and major environmental benefits.

4. Summary of Oral presentations and Poster Sessions

Over three days, 56 research papers were presented in the areas of Precision Crop Production and Protection; ICTs for Agricultural Research, Education and Extension; ICTs for Natural Resource, Livestock and agricultural supply chain management; Sensor technologies , Wireless Sensor Networks and Internet of things in precision agriculture; and Geospatial technologies in precision agriculture. Twenty posters were displayed during the poster session. The papers/posters presented in this conference are included in the publication of Allied Publishers Pvt. Ltd., New Delhi.

5. Recommendations of The Conference

1. Development of Precision Agriculture (PA), Precision Horticulture (PH) and Precision Livestock management (PLM) technologies in Farmer's Participatory mode have to undertaken by State Agricultural, Horticulture and Veterinary Universities and ICAR Institutes.
2. Courses on ICTs and Geospatial technologies that are key components of PA, PH and PLM must be made mandatory and these technologies should be extensively used in experiential learning by students in agriculture and allied disciplines.
3. Farmers awareness and training programmes to provide hands-on-experiences in PA, PH and PLM to be undertaken through Krishi Vigyan Kendras (KVK).
4. The academic institutions should facilitate and collaborate with private sector in the development of business models to provide services to the farmers for adoption of PA, PH and PLM technologies.