A REVIEW PAPER | International Journal of Agricultural Engineering | Volume 6 | Issue 1 | April, 2013 | 221–226

GPS and remote sensing adoption in precision agriculture

P.M. KAPURKAR, A.K. KURCHANIA AND S.N. KHARPUDE

Received : 08.02.2013; **Accepted :** 22.04.2013

See end of the Paper for authors' affiliation

Correspondence to:

P. M. KAPURKAR
Department of Renewable Energy Engineering, College of Technology and Engineering, Maharana Pratap University of Agriculture and Technology, UDAIPUR (RAJASTHAN) INDIA
Email : prashant.36@hotmail.com

ABSTRACT : Precision farming is information and technology based agricultural management system to identify, analyze and manage site-soil, spatial and temporal variability within fields for optimum profitability, sustainability and protection of the environment. Precision farming or satellite farming is a farming management concept based on observing and responding to intra-field variations. Today, precision agriculture is about whole farm management with the goal of optimizing returns on inputs while preserving resources. It relies on new technologies like satellite imagery, information technology, and geospatial tools. It is also aided by farmers' ability to locate their precise position in a field using satellite positioning system like the GPS or other GNSS. This article presents outline of progress and present standing of GPS and remote sensing precision agriculture technologies.

KEY WORDS : Precision agriculture, GPS, Remote sensing, GIS, Agricultural management

HOW TO CITE THIS PAPER : Kapurkar, P.M., Kurchania, A.K. and Kharpude, S.N. (2013). GPS and remote sensing adoption in precision agriculture. *Internat. J. Agric. Engg.*, **6**(1) : 221-226.

In many developing countries, agriculture is still the backbone of the economy. The success of precision farming depends on numerous factors, including the extent to which conditions within a field are known, how best we can manage, the exact quantity of input recommendation and the degree of application control, (Robert *et al*., 1995). Precision agriculture concept was initiated for site specific crop management as a combination of positioning system technology, variable rate technology, remote sensing, yield mapping etc. to optimize the profitability, sustainability with a reduced environmental impact. From centuries Indian farms are experiencing some sort of soft precision agriculture technology. But the challenges of free and globalized market as well as ever-increasing population with huge food grain demand create the scope of adoption of hard precision agriculture technology in Indian farms. So learning the new agricultural technology invented in developed countries and its proper modification and application according to the domestic condition is necessary, (Mondal *et al.*, 2011). The rapid revolution of precision agriculture has sparked research in many areas. These include the evaluation of these technologies, development of appropriate uses of the technologies, demographic patterns of use of these technologies, and economic and environmental benefits of the technologies. Research has suggested that adoption of precision agricultural technologies has been influenced by socioeconomic characteristics, such as farm size (Khanna, 2001).

With the progress and application of information technology in agriculture and IT revolution in developing countries like India, China etc., precision agriculture has been increasingly gaining attentions worldwide (Luo *et al.*, 2006). The adoption of precision agriculture technologies has been uneven, both geographically and temporally. The economic theory of induced innovation predicts that new technologies will be developed and adopted where they make more efficient use of the scarcest productive resources, (Norton and Swinton, 2001). PA is conceptualized by a system approach to re-organize the total system of agriculture towards a low-input, high-efficiency, sustainable agriculture (Shibusawa, 1998). Precision farming makes use of remote sensing to macro-control of GPS to locate precisely ground position and of GIS to store ground information. It precisely establishes various operations, such as the best tillage, application of fertilizer, sowing, irrigation, harvesting etc., and turns traditional extensive production to intensive production according to space variable data, (Shanwad *et al.*, 2004). Precision farming will likely gain in importance only when viable additional benefits such as reduced environmental burdens and increased flow of information, are recognized and evaluated and becomes part of the reward itself, (Auernhammer, 2001).

Zhang *et al.* (2002) studied worldwide applications and