

Precision Agriculture

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Introduction

Precision farming is an method to farm management known as precision agriculture (PA) makes use of information technology (IT) to make sure that soil and crops receive the exact nutrients they require for optimum health and yield. PA aims to guarantee profitability, sustainability, and environmental preservation.

Satellite agriculture, as-needed farming, and site-specific crop management are further terms for Precision agriculture. Precision farming requires specialized tools, software, and IT support. The strategy makes use of real-time data on the state of the crops, soil, and air as well as other pertinent details like labour prices, equipment availability, and hyper-local weather forecasts. The data is then used by predictive analytics software to give farmers advice on crop rotation, the best times to plant, harvest, and manage the land. Sensors in fields measure the temperature and moisture content of the air and soil. Real-time photos of specific plants are made available to farmers via satellites and unmanned drones. When combined with sensor and other data, the information from those photos can be processed to provide recommendations for both immediate and long-term decisions, such as when and where to plant a specific crop.



Why Precision farming:

- To increase agriculture productivity
- Prevents soil degradation
- Reduction of chemical application in crop production

- Efficient use of water resources
- Dissemination of modern farm practices to improve quality, quantity and reduced cost of production
- Developing favorable attitudes
- Precision farming changing the socio-economic status of farmers.

Advantages of Precision farming

- In order to maintain agricultural development, it will increase agricultural productivity and stop soil degradation in cultivable land.
- It will lessen the overuse of chemicals in crop cultivation.
- Precision farming will allow for effective use of water resources.
- GPS makes it simple to scan agricultural lands. Additionally, maps of soil properties and yield are also possible.

Disadvantages of Precision farming

- Farmers may be discouraged from using this farming practice by high capital expenditures.
- Before being used, precision agriculture techniques still need professional advice as they are in the early stages of development.
- Before the system has collected enough data to be completely implemented, it may take several years.
- It is a really challenging undertaking, especially the data collecting and analysis.

How India could benefit from precision farming?

- In India, improving and expanding the use of precision agriculture technologies can aid in lowering production costs, raising productivity, and more effectively utilizing natural resources.
- By enhancing profitability, productivity, sustainability, crop quality, environmental protection, on-farm quality of life, food safety, and rural economic development, it has the potential to revolutionize modern farm management in India.
- Site-specific uses of irrigation, herbicides, and fertilizers in cotton fields, oil palm plantations in South India, and coffee and tea gardens in Eastern India can significantly lower production costs and chemical pollution in the environment.
- When there aren't enough water resources, it can improve irrigation efficiency.



- Farmers can use forecasting to control issues like pests, illnesses, and nutritional deficiencies.
- Additionally, it expands the sector's chances for skilled employment and offers fresh techniques for assessing multifunctional factors like non-market functions.

Government role in precision agriculture

Precision Farming Development Centers:

In order to promote "Precision Farming & Plasticulture Applications for high-tech horticulture," Government has established Precision Farming Development Centers (PFDCs), which are housed in State Agricultural Universities (SAUs), ICAR Institutes like IARI in New Delhi, CIAE in Bhopal, CISH in Lucknow, and IIT in Kharagpur. These facilities have been serving as hub-centers for precision farming and plastic agriculture in their respective states. Under the officially subsidized Micro Irrigation programme, NCPAH developed five new Precision Farming Development Centers in 2008–09, with locations in Bhopal, Imphal, Leh, Ludhiana, and Ranchi.

Summary

In India the agriculture sector has poor productivity because of inefficient resource utilisation, significant biotic losses, and low level of mechanisation. India must shift beyond aggressive farming and toward precision farming in light of climate change, the loss of natural resources, and impending food catastrophe. To feed the people of in the world we cannot just keep following the old methods of agriculture Here in precision agriculture by using advance technology we can really minimise crop loss and we can use the resources efficiently thus we can improve the soil productivity yes this has some downsides but for humans to survive with the growing population we have to change to Precision farming