Precision agriculture: An overview

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DESCRIPTION

Precision Agriculture (PA), sometimes also called "Prescription Farming" or "Variable Rate Technology". PA encompasses a number of techniques that can be used in various areas of agricultural science. It can be defined as a new management technology based on georeferenced information for the control of agricultural systems and is based on the detail of georeferenced information through the application of monitoring processes and the integration of soil, plant and climate properties.

Precision agriculture is also known as satellite-based plant management or site-specific crop management. From this, a decision-making support system is developed for the entire farm management with the aim of optimizing the inputs and outputs of the different systems at regular intervals. The practice of this precision control agriculture is a GPS and GNSS-based (global positioning system) resource that takes into account, crop yield, moisture content, pH, and many other field-related variables. By organizing multiple sensors, multispectral imaging is also used to detect different specifics and disease states in plants. Remote sensing and near-range techniques have shown great potential in the detection of various plant diseases through the use of sophisticated technologies to detect various factors such as epidemiological, environmental, etc.

Precision agriculture merges the new technologies borne of the information age with a mature agricultural industry. It is an integrated crop management system that attempts to match the kind and amount of inputs with the actual crop needs for small areas within a farm field. This goal is not new, but new technologies now available allow the concept of precision agriculture to be realized in a practical production setting.

Precision farming has often been defined by the technologies that make it possible and is often referred to as Global Positioning System agriculture (GPS) or variable rate farming. As important as equipment is, it only takes a little thought to realize that information is the most important ingredient for accurate farming. Managers who use information effectively generate higher returns than those who don't.

Some of the important considerations in a precision agriculture system

Management

- Data acquisition and analysis
- Decision support system
- Increased attention to management
- Learning curve

Economics

- Changes in costs
- Changes in revenues
- Cash flow
- Risk

Alliances

- Accurate GPS availability
- Variable rate technology availability
- Site-specific management services availability

Financing

Environmental

Decrease input losses

Target nutrients to increase uptake efficiency

The need for precision agriculture

Farmers are often aware that their fields have different yields across the landscape. These fluctuations can be attributed to management practices, soil properties, and environmental properties. Soil properties that affect yield are texture, structure, moisture, organic matter, nutrient status, and landscape. Environmental properties include weather, weeds, insects, and disease.

Precision agriculture can solve the economic and environmental problems that surround production agriculture today. It is clear that many farmers have a sufficient level of management to benefit from accurate management. Questions remain about cost-effectiveness and the most effective use of the technology tools we have today, but the concept of "doing the right thing in the right place at the right time" has a strong and intuitive appeal. Ultimately, the success of precision agriculture largely depends on how well and how quickly the necessary knowledge for new technologies can be found.

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