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# Precision Agriculture

**LECTURE 1**



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# 1.1 Definition

- Precision Farming is generally defined as an information and technology based farm management system to identify, analyze and manage variability within fields by doing all practices of crop production in right place at right time and in right way for optimum profitability, sustainability and protection of the land resource.



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## 1.2 Objectives of precision farming

- To develop a methodology for identifying the causes of within field variation in crop performance.
- To develop practical guidelines required to implement precision farming technology to achieve best management.
- To explore the possibility of using remote-sensing methods and GIS to enable management decisions to be made in real time during the growth of the crop



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## 1.3 Need of precision farming

- To increase production efficiency
- To improve product quality
- Use of chemicals more efficiently
- Energy conservation
- To increase input use efficiency
- Soil and ground water protection
- Improve soil structure



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# 1.4 Components of precision farming

- Information or data base
- Technology
  - Global Positioning System
  - Differential Global Positioning System
  - Geographic information systems
  - Remote sensing
- Management



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## 1.5 Steps in precision farming

- **Identification and assessment of variability**
  - Grid soil sampling
  - Crop scouting
  - Use of precision technologies for assessing variability
- **Management of variability**
  - Variable rate application
  - Yield monitoring and mapping
  - Quantifying on farm variability
- **Evaluation of precision farming**



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# 1.6 Scope of precision farming in India

- In India, major problem is the small field size. More than 58 percent of operational holdings in the country have size less than 1ha.
- The crop yields are very low ( $\approx 1\text{t ha}^{-1}$ ) and very good potential exists for increasing productivity of rain-fed Cropping systems.



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# 1.7 Advantages of precision farming

- Overall yield increase
- Efficiency improvement
- Reduced production costs
- Better decision making in Agricultural management
- Reduced environmental impact





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# 1.8 Drawbacks of Precision Farming

- High costs
- Lack of technical expertise knowledge and technology
- Not applicable or difficult/costly for small land holdings
- Heterogeneity of cropping systems and market imperfections



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**THANK YOU**