1). Explain about precision agriculture of management

* Agricultural management is a broder concept of planning and running a farm for profitability and the sustainability

* Includes decision about what crops to plant, when plant and harvest. managing resources like water & labor and controlling pests and diseases.

i). SITE-SPECIFIC MANAGEMENT:

Precision agriculture allows farmer to manage their fields on a site-specific basis. Instead of running treating the entire field uniformly, farmers can apply inputs based on the specific needs

ii) PRECISION PLANTING:

Planting is a critical phase in crop production Precision farming involves using technology to ensure optimal seed placement, spacing and depth

iii) PRECISION PLANTING: IRRIGATION:

Planting is a critical phase in crop production Precision farming involves using technology to ensure optimal seed placement, spacing and depth. This reduces water wastage & minimizes the risk of over watering

iv) PRECISION FERTILIZER:

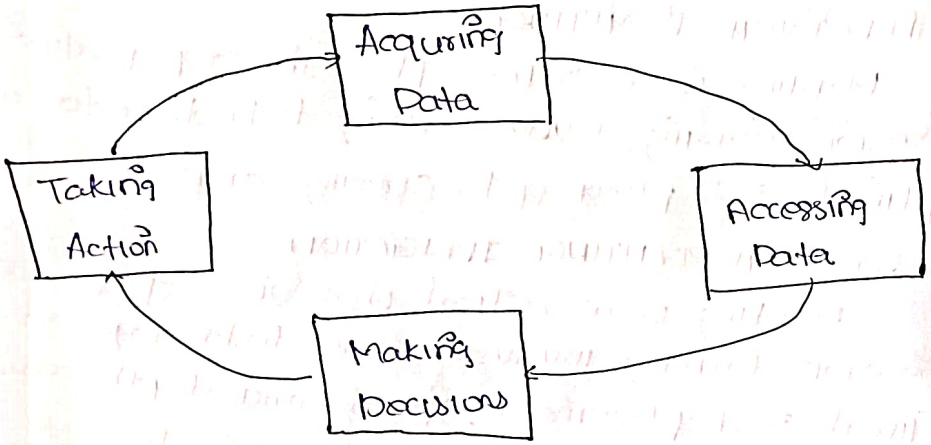
VRI is employed to apply fertilizer based on soil nutrient levels, resulting in more efficient nutrient use and reduced environmental impact

v) CROP MONITORING & HEALTH MANAGEMENT:

Remote sensing technologies and sensors monitor crop health in real time. this enables early detection of diseases pest or nutrient defeciences allowing farmers to take prompt corrective actions

vi) DATA-DRIVEN DECISION-MAKING:

The wealth of data generated by precision agriculture tools is used to make data-driven decision. farmers can analyze historical data, current conditions, and predictive models to optimize their practices for increased productivity & sustainability



Precision Agriculture cycle

2. DISCUSS HOW REMOTE SENSING TECHNIQUES APPLIED IN ESTIMATED CROP PRODUCTION ?

Remote sensing refers to the use of satellite imagery, aerial photography and drones to gather information and drones to gather information about crops without direct physical contact

i) AREA ESTIMATION:

- Remote sensing helps identify the extent of cultivated area under different crops
- Distinguishes crops through their spectral signatures
- Example: wheat, rice

ii) CROP CONDITION ASSESSMENT

- Multispectral and hyperspectral imagery detect the vegetation health
- Indices like NDVI (Normalized difference vegetation index) indicate vigor, stress & biomass
- Poor vegetation indicates lower expected yield

iii) GROWTH MONITORING:

- remote sensing tracks crop growth stages from the sowing to maturity
- Detect anomalies caugh by drught, pests or nutrient deficiency.
- Helps forecast production based on growth trends

iv) YIELD ESTIMATION:

- By integration satelite data with weather data & crop models, remote sensing estimates per lecture yield.

· Biomass Chlrophyl Content and Canopy Cover he predict production

v) EARLY WARNING OF CROP LOSS:

· Identifies drought-affected or flood-damaged religion

· Provides information for crop insurance & Compen

vi) INTEGRATION WITH GIS:

· Remote sensing data combined with GIS helps create crop production maps at district level

· Useful for planning procurement, storage an the market strategies

vii) Examples:

· India's FASAL project (Forecasting Agricultural output using Space) uses remote sensing for crop Production forecasting

· FAO also applies satellite-based systems fo the global crop monitoring

3) Explain plant production & Expert system

· Plant architecture refers to the 3-dimension of structure of a plant, emcompassing it spatia arrangement of stems, leaves & reproductive o

KEY COMPONENTS:

Steam structure: The main axis that support le and reproductive structures

* Leaf arrangement: The positioning of along the stem which. effects light capture & photosynthesis.

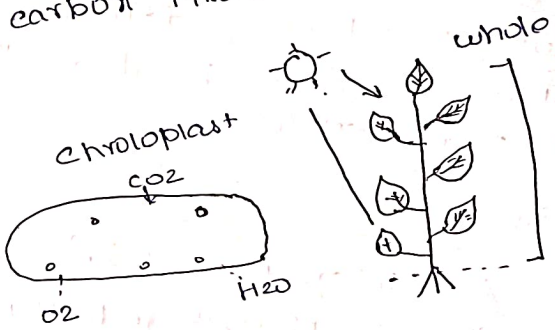
· Root system: The underground structure for water and nutrient update.

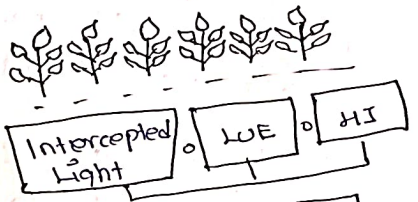
· Branching pattern: The growth and development of lateral-branches, influencing overall plant shape & density.

Functional Activities.

i). PHOTOSYNTHESIS:

Models simulate the conversion of light energy into chemical energy, focusing on chlorophyll activity, carbon fixation & oxygen release





⇦ Cellular Tissue Leaf whole plant + Ecological Upscale

ii). RESPIRATION:

These models represent the metabolic process where plants convert sugar into energy, highlightning the breakdown of glucose

iii) NUTRIENT UPDATE & TRANSPORT: Models describe the absorption of form the soil & movement through the plant tissue

EXPERT SYSTEMS:

Expert systems in horticulture, when integrated environment control system, plays a significant in automating decision making process.

i). KNOWLEDGE BASE:

Expert systems in horicelture have a knowledge base that includes information about different crops their growth requirements.

ii) RULE-BASED REASONING:

Expert system use a set of predefined rules to make decisions. these rules are based on the knowledge acquired from experts

iii) DATA INTEGRATION:

Expert system can integrate real time data from sensor within the greenhouses, including the temperature sensor.