

Improvement in Food Resources

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- Plants and animals are major food sources.
- We obtain food from agriculture and animal husbandry.
- Keeping in mind the population of India, it is necessary to increase India's production efficiency of crops and livestock.
- **Sustainable management** can be defined as the adoption of various farming and production management techniques to maximise yield in agriculture and animal husbandry.
- **Agriculture** is the art and science of cultivating soil, producing crops, rearing animals for food and useful products.

Kharif Crops

- They are grown in monsoon (June) and cultivated in autumn (October).
- Grown in hot and wet conditions.
- Examples: Rice, maize, tobacco, potato, onion, soyabean, millets (jowar and bajra), sugarcane, cotton, groundnut, pulses, pigeon pea

Rabi Crops

- They are grown in November and are harvested in April.
- Grown in cold and nearly dry conditions.
- Examples: Wheat, mustard, pea, barley, gram, linseed

The diagram consists of two horizontal rows. The top row has a dark red rounded rectangle on the left containing the text 'Inter-varietal cross-breeding' and a light pink rounded rectangle on the right containing a bullet point '•A cross between two different varieties of crops'. The bottom row has a green rounded rectangle on the left containing the text 'Inter-specific cross-breeding' and a light green rounded rectangle on the right containing a bullet point '•A cross between two different species of the same genus'. A dashed red line is positioned above the top row.

Inter-varietal cross-breeding

•A cross between two different varieties of crops

Inter-specific cross-breeding

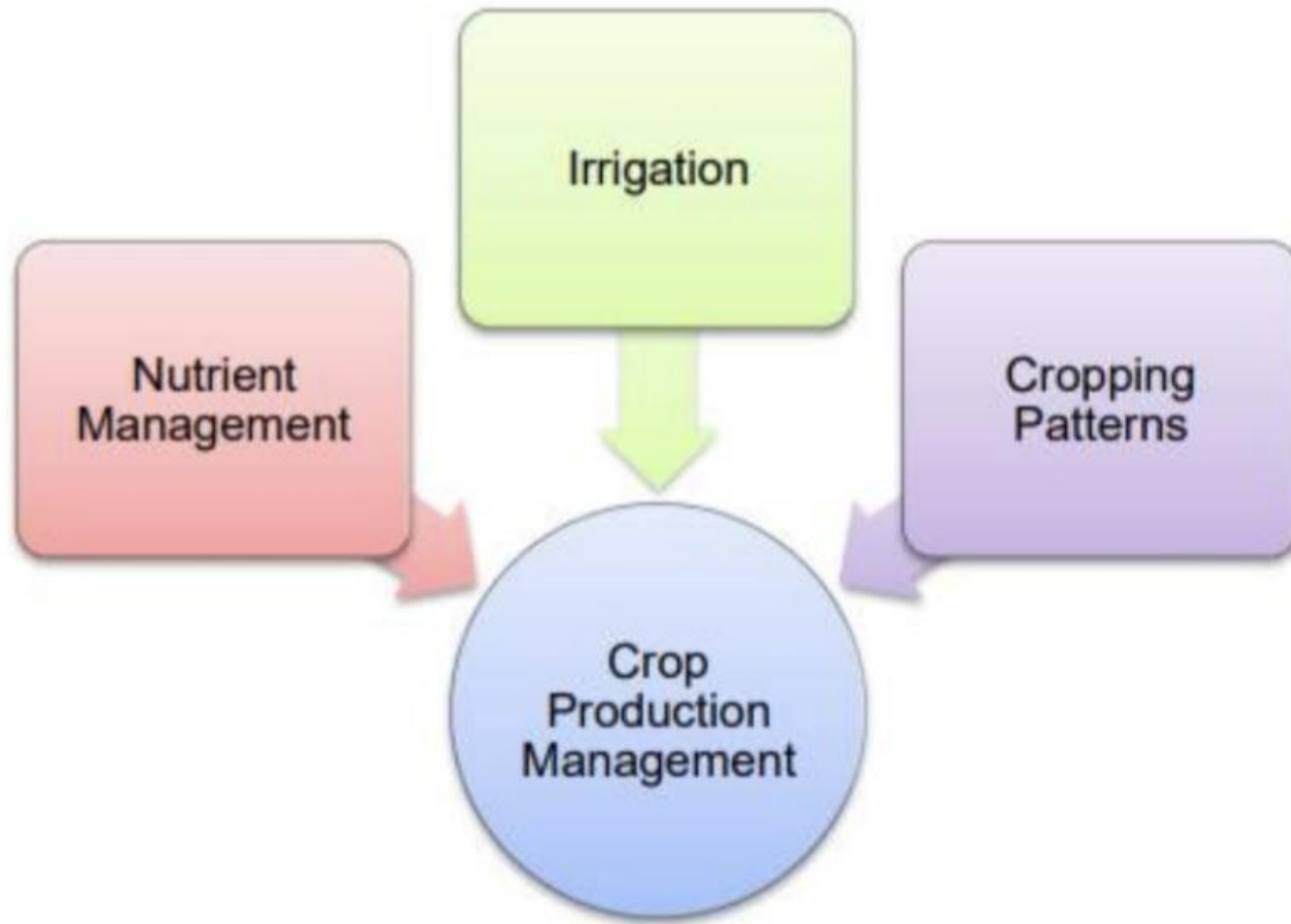
•A cross between two different species of the same genus

Wheat	Hira-moti, Kalyan sona, Sonora-64
Rice	Padma, Jaya, IR-8, Pusa-205, Basmati

1. Genetically Modified Crops

- A gene responsible for desirable characters is transferred from one crop variety to another crop variety. The crop into which the gene is introduced to obtain the desired result is called a genetically modified crop (GMO) or transgenic plant.
- Example: BT cotton

- ❖ American Scientist Norman Borlaug is known as the Father of the Green Revolution.
- ❖ M. S. Swaminathan, an Indian agricultural scientist, is known as the Father of the Green Revolution in India.



- Plants require 16 different nutrients which are obtained by air, water and soil.

Macronutrients

- Nutrients required by plants in large quantities.
- The **six macronutrients** are nitrogen, phosphorus, potassium, calcium, magnesium and sulphur.

Micronutrients

- Nutrients required by plants in small quantities.
- The **seven micronutrients** are iron, manganese, boron, zinc, copper, molybdenum and chlorine.

Compost (Vermicompost)	Green Manure
It is formed by the decomposition of vegetable and animal wastes, domestic waste and eradicated weeds.	Farmers grow leguminous plants (e.g. groundnuts, soya beans, pulses) in between two crops.
The waste matter is decomposed in pits. This process is called composting.	Leguminous plants help to replenish the nitrogen content in the soil.
Sometimes, organic substances are decomposed by earthworms and are converted into humus. This is called vermicompost.	Sometimes, before sowing seeds, plants such as sun hemp or guar are grown and mulched by ploughing them into the soil.

Advantages of Manures:

- Increase the water-holding capacity of the soil
- Make the soil porous which facilitates the exchange of gases
- Improve the texture of the soil
- Replenish the general deficiency of nutrients

Fertilisers:

- Fertilisers are human-made substances.
- They contain inorganic salts or organic compounds.
- Fertilisers are nutrient-specific so that they can fulfil the specific requirement of nutrients.
- Fertilisers are costly and prepared in factories.
- Overuse of artificial fertilisers may reduce the fertility of soil. The soil may become infertile over a period of time.

Advantages of Irrigation

Provides moisture to germinating seeds

Facilitates the absorption of nutrients by minerals

Disadvantages of Irrigation

Excess of water in the soil leads to water logging

Sometimes, it inhibits the process of germination

Roots do not grow properly in a standing water field

Excess irrigation destroys standing crops

It increases the amount of salt on the surface soil as water gets evaporated

Cropping Patterns

Mixed Cropping

- Growing two or more crops simultaneously on the same piece of land
- Minimises the risk of crop failure
- Wheat + Gram
- Wheat + Mustard
- Groundnut + Sunflower

Inter-cropping

- Growing two or more crops simultaneously in the same field in a definite pattern
- Increases the productivity per unit area
- Soyabean + Maize
- Finger millet (Bajra) + Cowpea (lobia)

Crop Rotation

- Growing of different crops on the same land in pre-planned succession
- Allows soil to recover its lost nutrients
- Maize-Mustard-Sugarcane-Fenugreek
- Maize-Potato-Sugarcane-Pea

Weeds are removed by various methods:

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| • Weeds can be pulled out by hand. |
| • A trowel or small arrow can be used to remove weeds. |
| • Chemicals generally called weedicides can be used to kill weeds. Examples: 2,4-D, MCPA |
| • Releasing certain insects which destroy weeds. Example: Cochineal insect |