Crop Production & Management.

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1 Introduction to Crops

- **Crop** → Plants of the **same kind** grown on a **large scale** in a field for food or raw material.
- Farmers grow crops according to **climate, soil & human needs** → different plants in different seasons.

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2 Types of Crops by Season

Season	Sowing Time	Harvest Time	Examples	Climate Needs
Rabi (Winter)	Oct–Nov	Mar–Apr	Wheat, barley, oats, mustard, gram, peas, potato, carrot, radish	Cool & dry
Kharif (Summer/Rainy)	May–Jun	Sep–Oct	Rice, maize, jowar, bajra, soybean, groundnut, cotton, sesame, lady's finger, pumpkin	Warm & wet
Zaid / Long-duration	Feb (sown)	Nov (harvest)	Sugarcane, watermelon, muskmelon, cucumber	Need long growth period

Reason: Every crop needs a specific temperature, rainfall and photoperiod.

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3 Practices of Crop Production

(A) Preparation of Soil

- Loosen & turn upper 25–30 cm of soil → aeration & good water holding.
- Benefits:
    - Roots penetrate deeply.
    - Earthworms & microbes grow → soil fertility.
    - Old crop residues decompose & release nutrients.
- **Tools**:
    - *Plough*: traditional wooden/iron.
    - *Hoe*: breaks lumps, removes weeds.
    - *Cultivator*: tractor-driven, faster.
    - *Leveller*: breaks clods, levels field.

(B) Sowing of Seeds

- Use **clean, healthy & viable seeds**.
- **Seed selection test** → put seeds in water:
    - Good seeds sink.
    - Hollow/pest-damaged seeds float.
- **Methods**:

1. Broadcasting (scattering by hand) – easy but uneven.
2. Sowing in furrows by hand.
3. **Seed drill** – even depth & spacing; can also deliver fertilizer.

Nursery – Small beds where seeds (paddy, tomato, brinjal, capsicum) are first grown; saplings later transplanted.

(C) Adding Nutrients

Plants absorb nutrients through roots → soil must be replenished.

Manure

- Organic, made by **decomposition** of plant & animal waste.
- Types:
    - **Farmyard manure** (animal dung + straw).
    - **Compost** (kitchen/garden waste).
    - **Green manure** (leguminous crops ploughed before flowering).
    - **Vermicompost** (using red earthworms *Eisenia fetida*).

Fertilizers

- Industrial, nutrient-specific:
    - Urea → Nitrogen
    - Superphosphate → Phosphorus
    - Potash → Potassium
    - NPK → mixture.

Manure vs Fertilizer:

- Manure improves soil structure & adds humus.
- Fertilizers give quick nutrients but overuse spoils soil & water.

(D) Irrigation

- Supplying water artificially when rainfall is insufficient.
- **Sources**: wells, tubewells, ponds, lakes, rivers, canals.
- **Traditional devices**: Moat (pulley & rope), Dhekli, Chain pump, Persian wheel.
- **Modern methods**:
    - **Sprinkler** – water sprayed like rain (good for sandy soil).
    - **Drip irrigation** – water drips near plant roots; saves water.

(E) Protection of Crops

1. **From pests & diseases**
    - Use resistant varieties.
    - Treat seeds with fungicides before sowing.
    - Remove alternate hosts (weeds).
    - Spray pesticides/fungicides carefully (cover face/eyes).
2. **From insects**
    - Select insect-resistant varieties.
    - Encourage natural predators (birds, ladybirds).
    - Limited chemical insecticides.
3. **From birds & rodents**
    - Scarecrow, beating drums, firecrackers.
4. **From wild animals**
    - Fencing, thorny hedges, farm dogs.

(F) Weeding

- **Weeds** = unwanted plants competing for light, nutrients, water.
  Examples: Amaranthus (chulai), Chenopodium (bathua).
- Control:
    - Manual uprooting/khurpa/rake.
    - Tilling before sowing destroys seedlings.
    - Weedicides (e.g., 2,4-D) – but limited use due to pollution.

(G) Harvesting, Threshing & Winnowing

- **Harvesting**: Cutting mature crop (by sickle or harvester).
- **Threshing**: Separating grains from stalk.
- **Winnowing**: Separating grain from chaff using wind or machine.
- **Combine harvester** – does harvesting + threshing + cleaning.

Harvest Festivals:

- Baisakhi (Punjab – wheat).
- Pongal (Tamil Nadu – rice).
- Bihu (Assam).

(H) Storage

- Grains dried to ≤14% moisture → prevent fungal attack.
- Stored in:
  - Silos (metal bins),
  - Dry, fumigated godowns,
  - Cold storages (for fruits/vegetables).
- Neem leaves repel insects.

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4 Improvement in Crop Production

Technique	Aim / Result
Selection of good seeds	Better germination & yield
Hybridisation	Combine traits of two varieties
Use of HYV seeds	High Yielding Varieties
Green Revolution	1960s, increased food grains by new seeds + irrigation + fertilizers + machinery
Important scientist	Dr. M.S. Swaminathan (Father of Green Revolution, India)

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5 Food from Animals (Animal Husbandry)

Branch	Product / Purpose
Dairy farming	Milk from cows & buffaloes
Poultry farming	Eggs, meat
Apiculture	Honey, beeswax
Pisciculture	Fish
Sheep/goat rearing	Wool, meat
Pig farming	Pork

Proper housing, feed, vaccination & hygiene are necessary.

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6 Extra Points for Exams

- **Seed germination factors** → water, air, warmth.
- **Tilling benefits** → aeration, mixing manure, killing weeds.
- **Continuous cropping** → depletes soil → need crop rotation & manure.
- **Crop rotation** → alternate cereals & pulses to maintain fertility.
- **Sustainable practices** → organic farming, bio-pesticides, water conservation.