



Chapter 3 Classification of Field crops



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Chapter 3 Classification of Field Crops

What are Field crops?

It is any of the herbaceous plants grown on a large scale in cultivated fields for agriculture purpose, primarily;



Grains



Forage



Sugar



Oil



Fibre

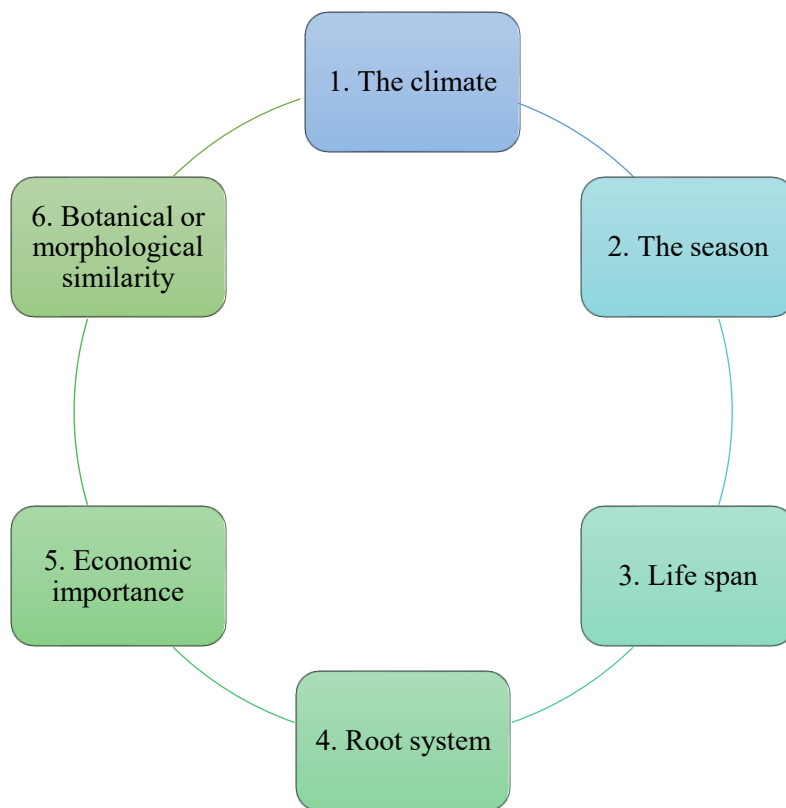
- *This includes other than fruits and vegetables.*
- *Field crops provide the food, feed grain, oil, and fibre for domestic consumption and are major component of a nation in progress*

Classification of field crops

Generally, classification of these species is important for these reasons:

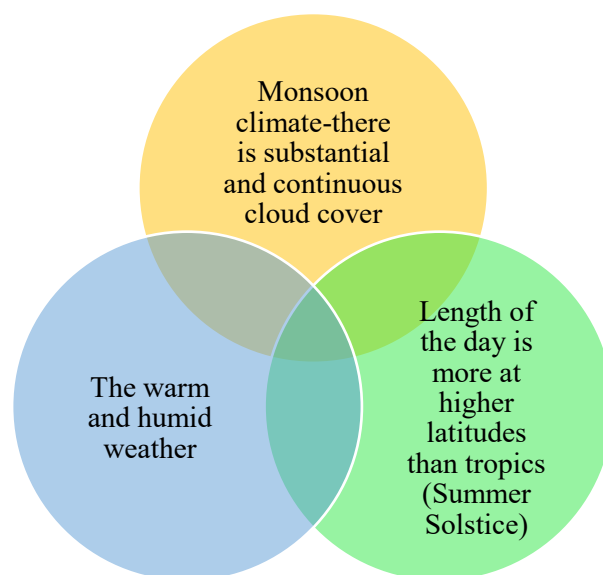
- o To get acquainted with crops
- o To understand the requirement of soil & water of different crops.
- o To know adaptability of crops.
- o To know the growing habit of crops.
- o To understand climatic requirement of different crops.
- o To know the economic produce of the crop plant & its use.

Field crops may be classified in more than one way. It may be on the basis of:



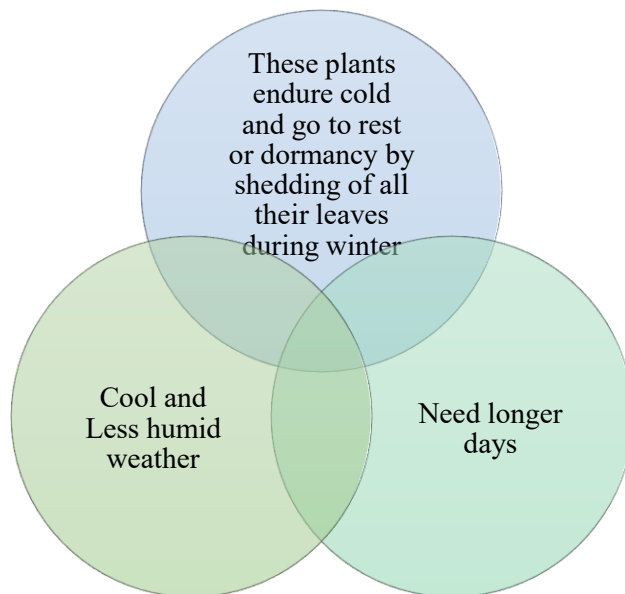
Classification on the basis of Climate

1. Tropical Crops :



- Example – Rice, sugarcane, jowar etc

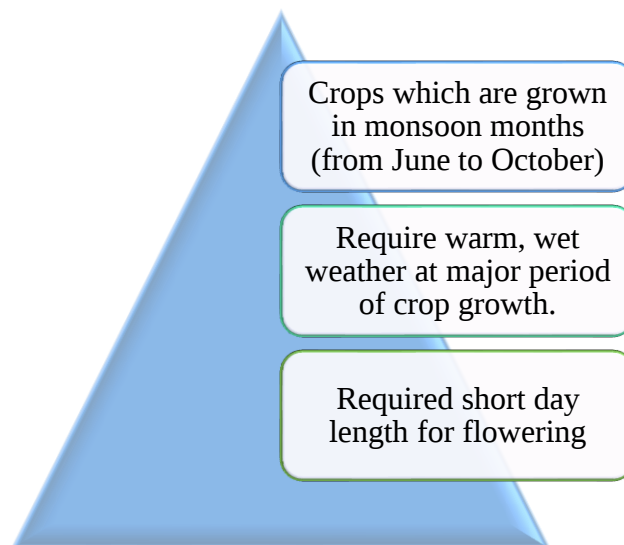
2. Temperate Crops



- Example -Wheat, gram, potato etc

Classification on the basis of season

1. Kharif crops:



Examples:



Rice

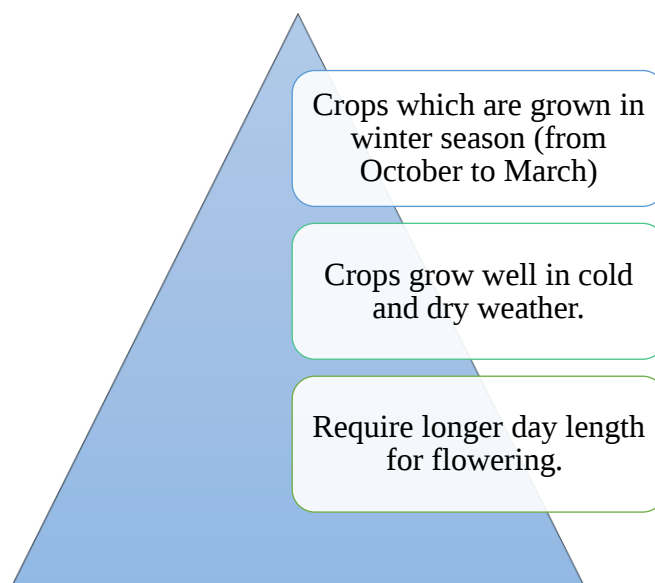


jowar



Groundnut

2. Rabi Crops



Examples:

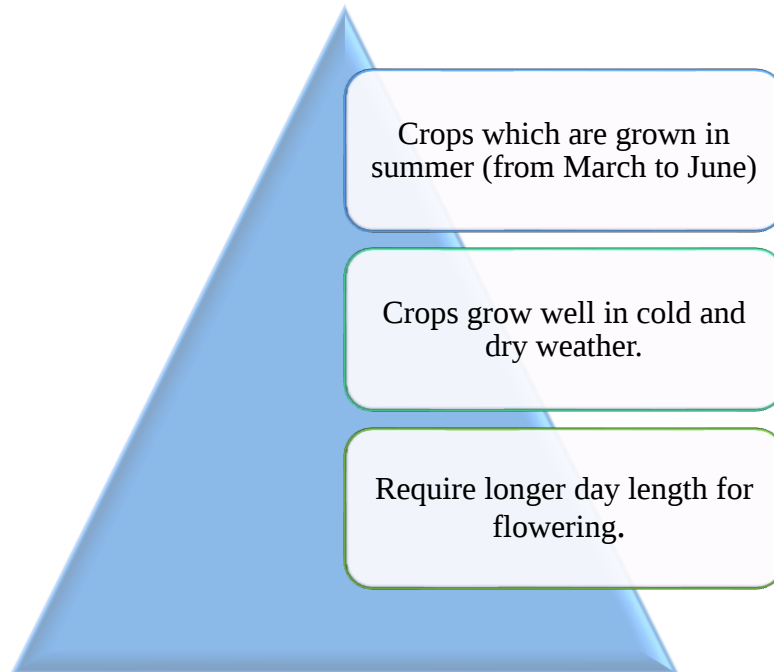


Gram



Wheat

3. Zaid



Examples:



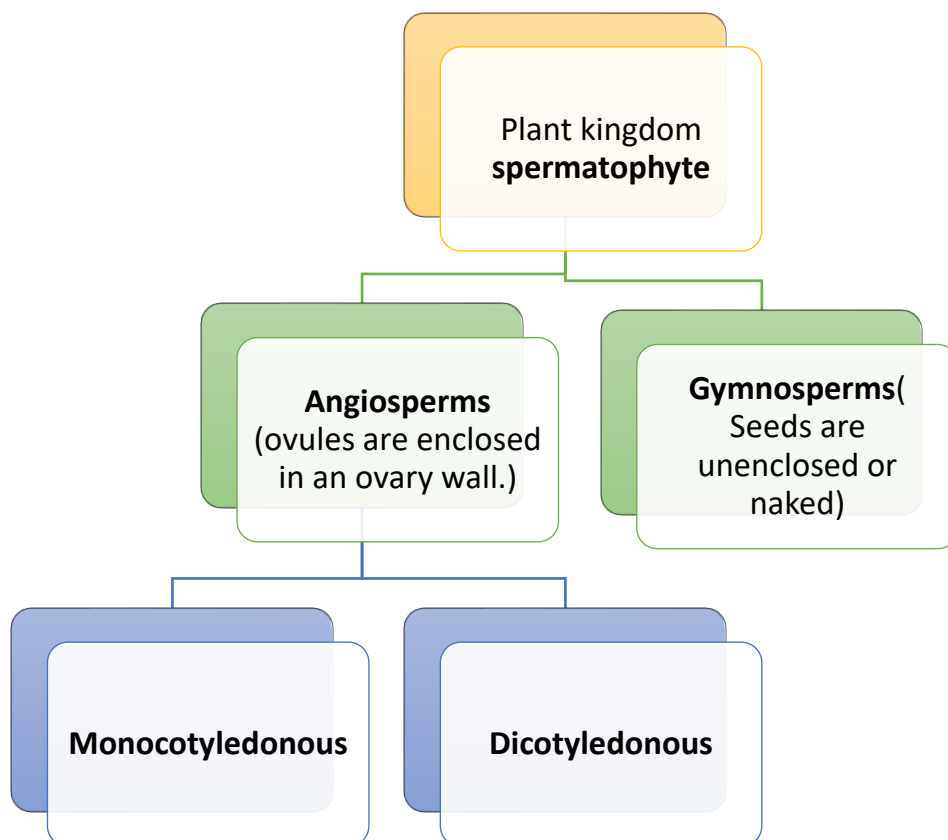
Cucumber



Watermelon

Classification on the basis of Botanical or morphological similarities in crops

- Botanical classification is based upon similarity of plant parts and flower structure.
- Field crops belong to the “**spermatophyte**”, or **seed plant**, division of “plant kingdom”, which includes plants reproduced by seeds
- This is the most **important and oldest classification** of plants. This idea has been developed and updated many times since its introduction in 370 B.C. by Theophrastus.



- **Carl Van Linne** (1707-1778), commonly known as Carolus’ Linnaeus, introduced another system of recognizing plants i.e **binomial nomenclature**
- Each crop plant has two names; **the genus and the species**. The genus starts with capital letter, whereas the species name is small
- For example, the scientific name of **wheat** is ***Triticum aestivum* L**

Scientific names of some common Field Crops:

Scientific name	English name
<i>Triticum aestivum</i> L.	Wheat
<i>Hordium vulgare</i> L.	Barley
<i>Oryza ativa</i> L.	Rice
<i>Zea mays</i> L.	Maize, Corn
<i>Sorghum bicolor</i> (L.), Moench	Sorghum
<i>Saccharium officinarium</i> L.	Sugar cane
<i>Pennisetum typhoides</i> L.	Egyptian Millet
<i>Avena sativa</i> L.	Oats
<i>Secale ceral</i> L.	Rye
<i>Vicia faba</i> L.	Faba bean
<i>Trifolium alexandrinum</i> L.	Egyptian Clover
<i>Medicago sativa</i> L.	Alfalfa
<i>Trigonella foenum-groecum</i>	Fenugreek
<i>Vigna sinesis</i> L.	Cow pea
<i>Lathyrus sativus</i> L.	Grass pea
<i>Cicer arietinum</i> L.	Chick peas
<i>Lupins termis</i> L.	Egyptian lupin
<i>Glycine max</i> (L.), Merr.	Soy bean
<i>Arachis hypogaea</i> L.	Peanut
<i>Gossypium barbadense</i> L.	Cotton
<i>Linum usitissimum</i> L.	Flax
<i>Hibiscus cannabinus</i> L.	Hemp

Spermatophytes are also known as phanerogams or phenogamae; comprise those plants that produce seeds, hence the alternative name seed plants.

ANGIOSPERM

GYMNOSPERM

Seed-producing flowering plants whose seeds are enclosed within an ovary. These are Hardwood.

Gymnosperm reproduce by complex structure known as seed; producing an embryo plant provide with the supply of food and a protective seed coat. They are non-flowering plants whose seeds are unenclosed or “naked.” These are softwood

Examples of angiosperms are monocots like lilies, orchids, agaves (known for agave nectar) and grasses; and dicots like roses, peas, sunflowers, oaks and maples.

Examples of gymnosperms are cone bearing pines, fir and cedar.



Flowering ornamental /garden plants

Angiosperm



Fruit bearing flowering tree; apple – Angiosperm

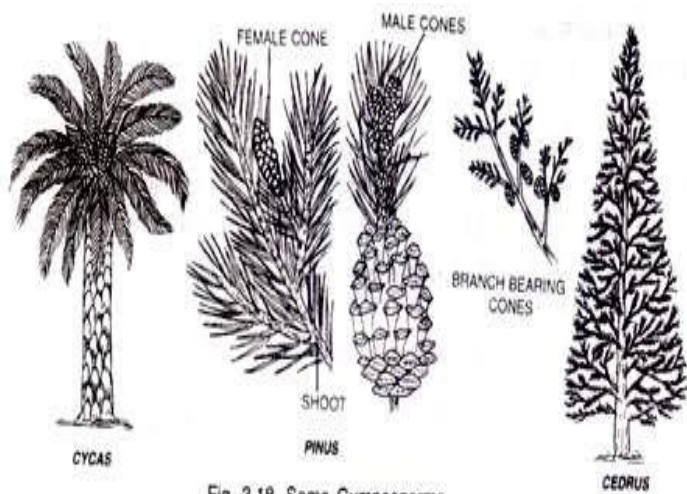


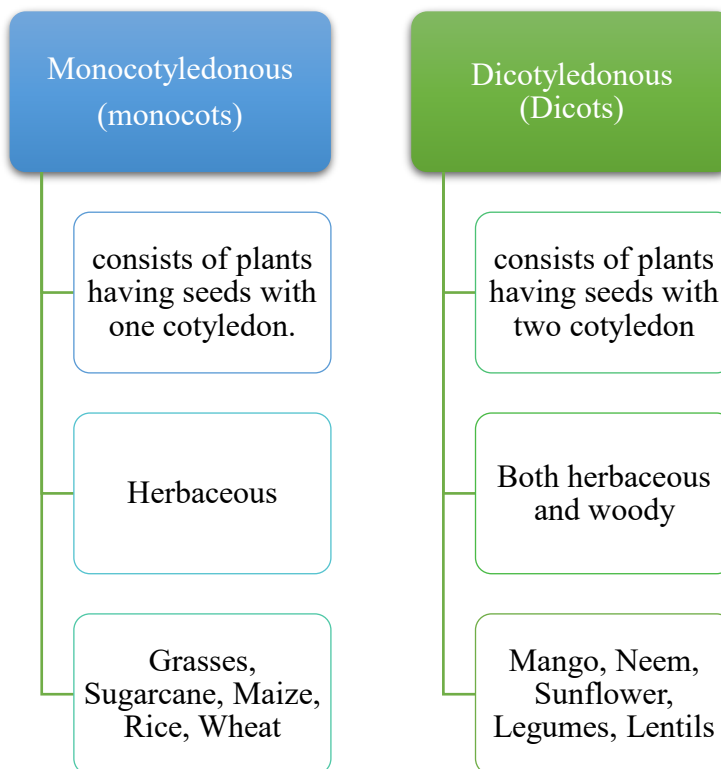
Fig. 3.18. Some Gymnosperms.



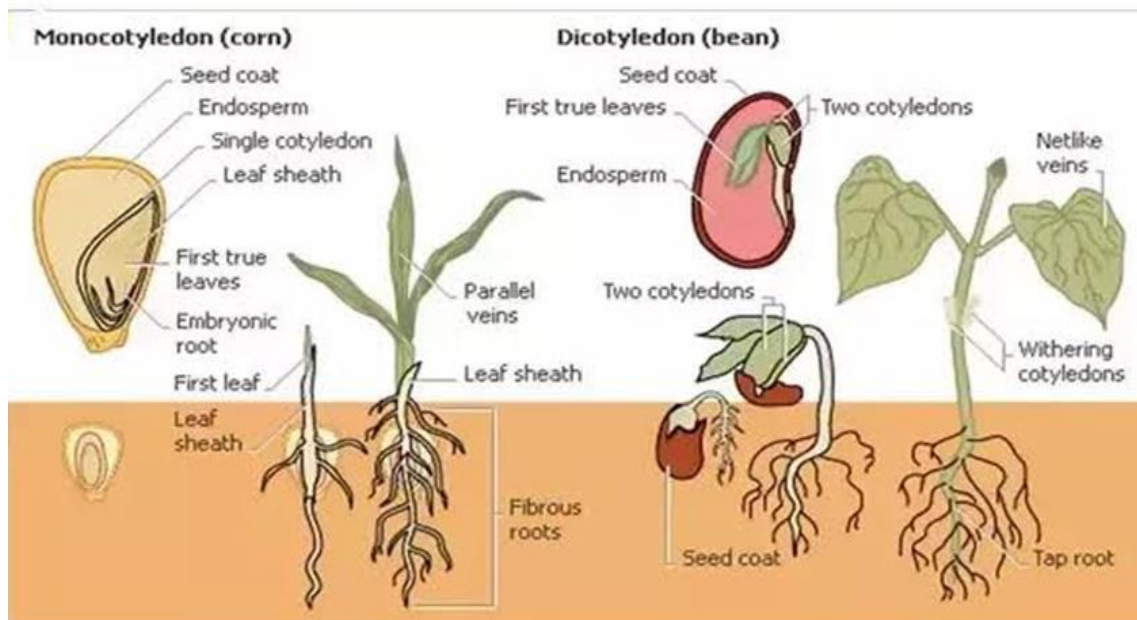
PINE TREE- needle like leaves and cone

“A Cotyledon is a significant part of the embryo within the seed of a plant, and is defined as "The primary leaf in the embryo of the higher plants; the seed-leaf”

Angiosperms can be further divided into:



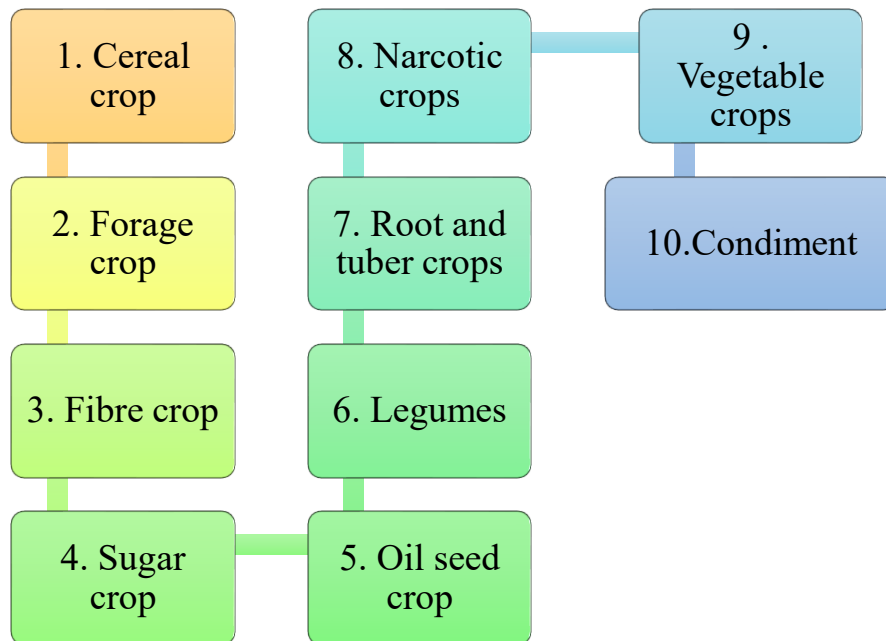
MONOCOT & DICOT SEEDS



MONOCOTS				
 One cotyledon	 Veins usually parallel	 Vascular bundles usually complexly arranged	 Fibrous root system	 Floral parts usually in multiples of three
EMBRYOS	LEAF VENATION	STEMS	ROOTS	FLOWERS
DICOTS				
 Two cotyledons	 Veins usually netlike	 Vascular bundles usually arranged in ring	 Taproot usually present	 Floral parts usually in multiples of four or five

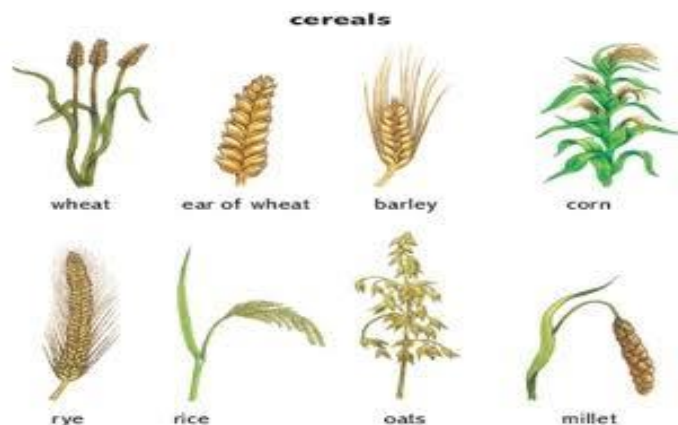
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Classification on the basis of economic importance:



Cereal crop - defined as a **grasses belonging to family Poaceae, grown for its edible seed**. Cereals are also known as grain crops.

- They are mostly narrow and long leaved plants without main stem.
- **The major cereal crops are wheat, maize, rice, barley, oat, rye, triticale, sorghum, and millet.**



Forage crops : which are grazed by animals or harvested for green chop, hay, silage, or soiling are classified as forage crops.

- More technically, forages have been defined as plant material with a dry-matter fiber content over 25%.
- When cereal crops are harvested as whole plants and used for animal feed, they are termed as fodder.
- Most of the forage crops belong either to the grass family Gramineae or the Leguminosae, e.g. Barseem , clovers



Fibre crops : crops which are **grown for their fiber** and are used in making textiles, ropes, and rugs. Important fiber crops are cotton, jute, flax, sunkukra, sunhemp, kenaf, and sial.



Oilseed crops : Crops which are grown for the purpose of extracting oil from their seed.

The main oilseed crops are rape and mustard, groundnut or peanut, sunflower, safflower, soybean, sesame, castor bean, linseed, and flax.



- **Sugar crops:** crops which are used for the production of sugar include sugarcane, sugar beet, and sweet sorghum.



- **Root and tuber crops:** These are vegetable crops grown for their edible underground parts like roots, bulbs, rhizomes, corms, and stem tubers, e.g. carrot, radish, turnip, onion, garlic, and potato.
 - **A root is** a compact often enlarged storage organ with hairy stems that develop from root tissue. Ex carrots, turnip and casava
 - **Tuber** is an enlarged storage organ but it develops from **elongated stem tissue or rhizome**. Ex potato, yam, sweet potatoes etc.



- **Legumes** : crops belong to the family Leguminosae and **are grown for their edible seed.**
 - Legumes are grown agriculturally, primarily **for human consumption , for livestock forage, silage and as soil-enhancing green manure.**
 - Alfa-alfa, Chickpea or gram, pea, pigeon pea, cowpea or lobia, mung bean, mash bean, faba bean, field bean, lima bean, and lentil are major leguminous crops.



Narcotic or drug crops : This category includes those crops which have some **narcotic or drug value,**

- Their extracts or tissues have hallucinating and calming effects on nervous systems of humans.
- e.g. poppy, tobacco, tea, coffee, and peppermint. These are also known as medicinal crops.



Vegetable or garden crops: Vegetable crops which are grown for their edible leaves, shoots, flowers, fruits, and seeds.

- The branch of horticulture which deals with cultivation of vegetables is called “**olericulture**”.
- Asparagus, broccoli, cabbage, cauliflower, spinach, cucumber, pumpkin and squash, tomato, eggplant, and okra or lady’s finger are grouped together as vegetable crops.



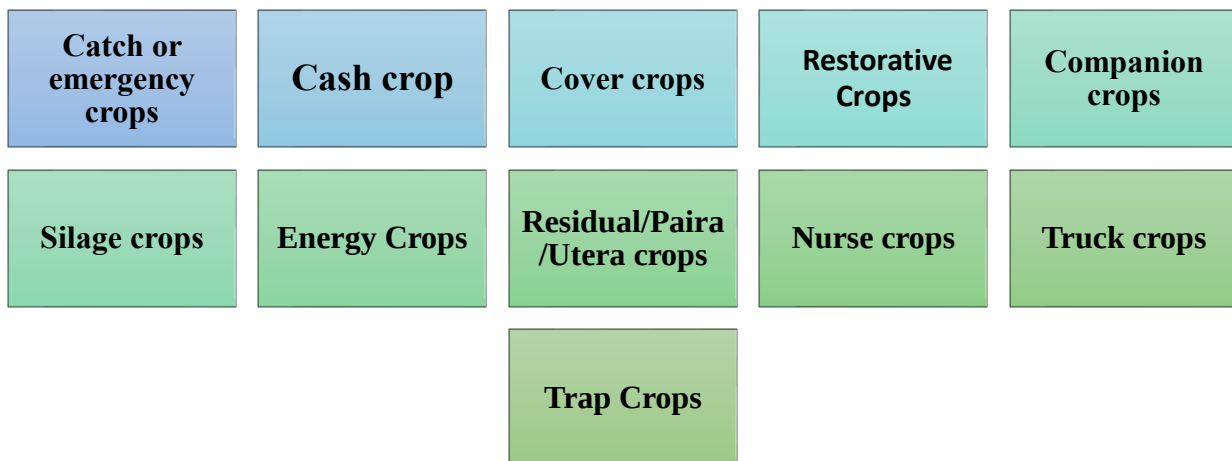
Condiment: Crops which are **grown and consumed as condiments**,

- These include culinary **herbs, spices, and plants** from which flavourful chemicals can be extracted e.g. coriander, mint, black pepper ,cardamom chilies etc



Classification based on purpose

These classifications are used to refer to plants having special advantages to the farmer himself in relation to his farming practices, and include



Catch or emergency crops:

These crops are used to substitute main crops that have failed on account of unfavourable conditions. They have fast growth rate and are short duration crops. such as rye, millet and clover, chickpea, cowpea etc



Millet as catch crop

Cover crops: Cover crops are known for their potential to hold the soil particles together to protect against soil erosion through wind and water.

Eg. clover , rye, groundnut, sweet potatoes etc



Cover crop

Cash crop: any crop grown to generate Cash/profit rather than for subsistence.

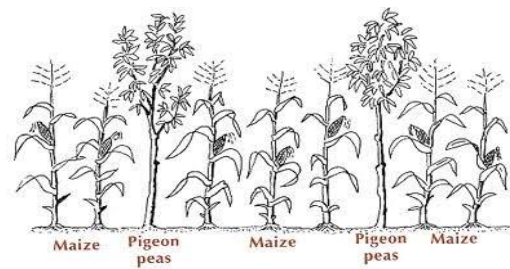
Eg. Sugarcane, coffee, jute, cotton etc



Cultivation of cash crop

Companion crops: In this case a crop can be intercropped with another one and each crop is harvested separately.

For example, onion and garlic can be intercropped with cotton crop, or soybean with maize



Companion crops : maize and pigeon pea

Silage crops: these crops have been harvested at early maturity, finely chopped, packed tightly to exclude air and stored in tower silos, pits or trenches for properly fermentation which is used as animal feed during lean period or off season. They include corn, sorghum, forage grasses and legumes



Standing Corn used as a silage after harvest

Restorative Crops :

These crops are known for their positive impact on the soil since they add organic matter to soil and root nodules in the roots of these crops fix atmospheric nitrogen into nitrates and nitrites in the soil and thus enhance the fertility of such soils.

Example: all leguminous crops such as lentils, mung, cowpea



Residual/Paira/Utera Crops

These crops are sown in the fields without preparatory tillage with the near harvest crop.

Residual crops are called so because their purpose is to utilize the residual moisture in the field when the previous crop is near harvest.

Examples: Crops like (gram, lentil, chickpea etc.) are sown in the paddy fields, 10-15 days prior to its harvesting, to conserve moisture.



Lentils in rice follow

Nurse Crops :

These crops are introduced for the nourishment of other crops by shading it, protecting it from frost, insolation or wind.



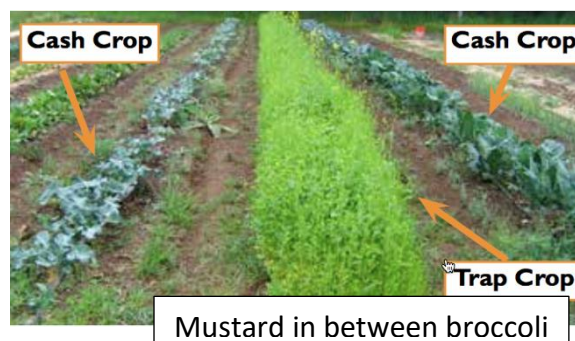
Sunhemp in Sugarcane

Eg. Sunhemp in Sugarcane, Jowar in cowpea

Trap Crops :

These are crops grown in the fields of main crops for trapping the harmful insects, nematodes or weeds.

Examples: castor incorporated in cotton and groundnut act as trap crop for army worm pest.



Truck Crops

Growing one or more vegetable crops on large scale for fresh shipment to distant market.

Ex. Potatoes, Tomatoes, melons ,broccoli etc.



Energy Crops

These are non-food crops which are harvested and combusted to produce heat and power. Example : Woody crops such as Willow or Poplar are widely utilised, as well as tropical grasses such as **Miscanthus** and **Pennisetum purpureum**, due to their ability to grow fast and to provide high output of biomass per hectare.

Classification according to life span

All field crops can be divided into three categories according to the length of their life cycle as follows:

1. Annual crops

Plants that perform their entire life cycle from seed to flower within a single growing season. All roots, stems and leaves of the plant die annually. Only the dormant seed bridges the gap between one generation and the next.

Most field crops are considered annual crops

wheat, barely, rice, maize, sorghum, faba bean, lentil, chick pea, lupine, flax, soybean, sesame, sunflower, safflower etc

2. Biennial crops:

Plants which require two years to complete their life cycle.
First season growth results in a small rosette of leaves near the soil surface..

During the second season's growth, stem elongation, flowering and seed formation occur followed by the entire plant's death.

onion, sweet clover, and sugar beet.

3. Perennial crops:

Plants that persist for many growing seasons, lasts longer than two years

They have an indefinite life period. They do not die after reproduction but continue to grow indefinitely from year to year.

Sugar cane, white clover, and alfalfa

Classification according to root depth

It is clear that the root system of field crops differ in structure, function and extent. Therefore, field crops can be classified according to the depth of their roots as follows:

1. **Hallow root crops:** the root system of these crops extends in the soil to a depth of one meter such as wheat, barley and rye.



2. **Intermediate crops:** the depth of the root system of these crops ranges from 1- 1.5 meter in the case of faba bean and sugar beet.



3. **Deep root crops:** the root system of these plants extends in the soil to a depth more than 1.5 meter as in alfalfa



Classification Based on Root System:

1. **Tap root system:** The main root goes deep into the soil. e.g. Tur, Grape, Cotton etc.
2. **Adventitious/Fiber rooted:** The crops whose roots are fibrous shallow & spreading into the soil. e.g. Cereal crops, wheat, rice etc.

Leading states in production of Crops

Crops	States (Production)
Rice	WB> UP
Wheat	UP > MP
Sugarcane	UP> Maha.
Maize	Karnataka > MP
Oilseeds	MP> Raj
Cotton	Guj >Maharashtra
Coffee	Karnataka > Kerala
Mustard	Raj>Haryana
Tea	Assam > WB

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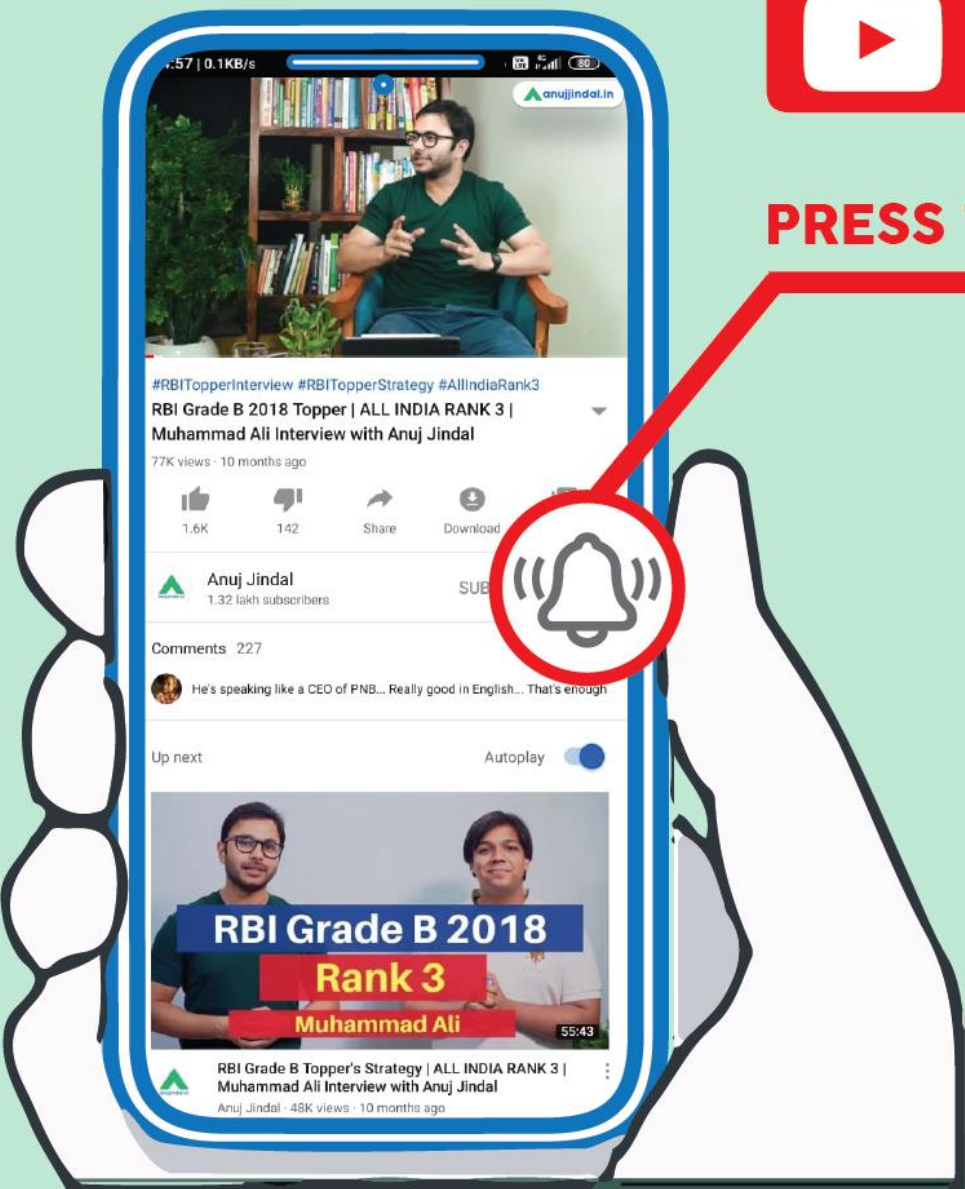
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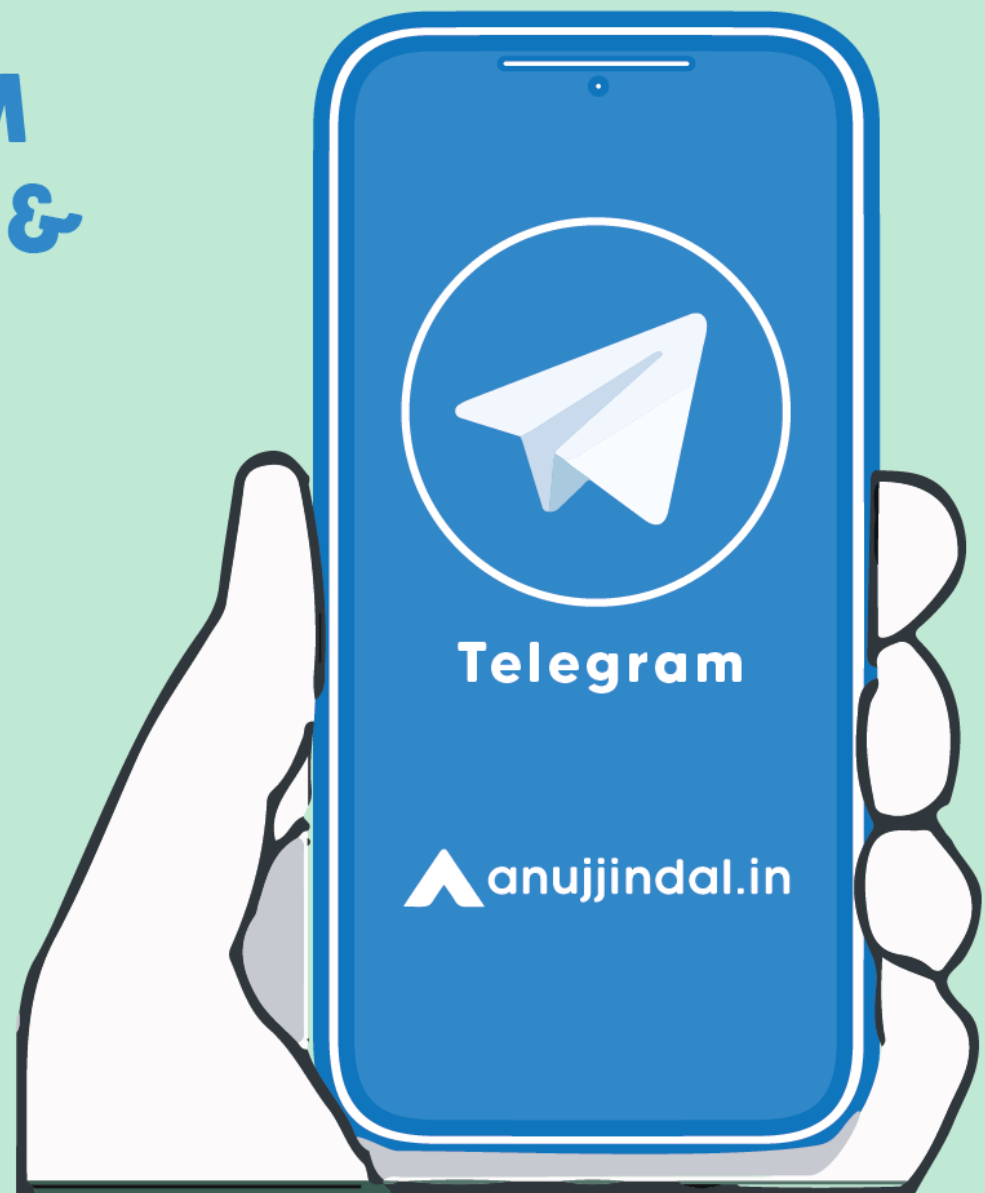
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RBI



All India Rank 10

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Lal Chand Kumar



Cleared NABARD

Krishna Kumar Singh



Cleared NABARD

Anshu Goel



Cleared NABARD

Jatin Kumar



Cleared NABARD

Atul Yadav



Cleared SEBI

Abhishek Kumar



Cleared SEBI

Vishwanidh Singh



Cleared SEBI

Gopika Jayan



Cleared SEBI

Vasanti Kesari



Cleared SEBI

Swetha Bodagala



NET with 98 Percentile

Anushka Keshri



JRF with 96.92 Percentile

Vaishali Jadon



NET with 89.27 Percentile

Srishti Gupta



JRF with 72 Percentage

Abhishek Mohanty



NET with 68 Percentage

Dinesh Mohan



JRF with 64.66 Percentage

Adhwaresh Pandey

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