

# Cereals

All cereals belong to the grass family and their characteristic fruit is caryopsis in which pericarp remains completely fused with seed coat. They are rich in carbohydrates, proteins, oils and vitamins. Moisture contents of cereals are very low and as such they can be stored for long periods without deterioration.

## Some important cereal crops:

Cereal crops are usually classified into the following two groups:

- 1- **Major cereal crops** – these include wheat, barley, rice and maize.
- 2- **Minor cereal crops** – these include oats and rye.

## 1. Wheat

Botanical name: *Triticum* spp.

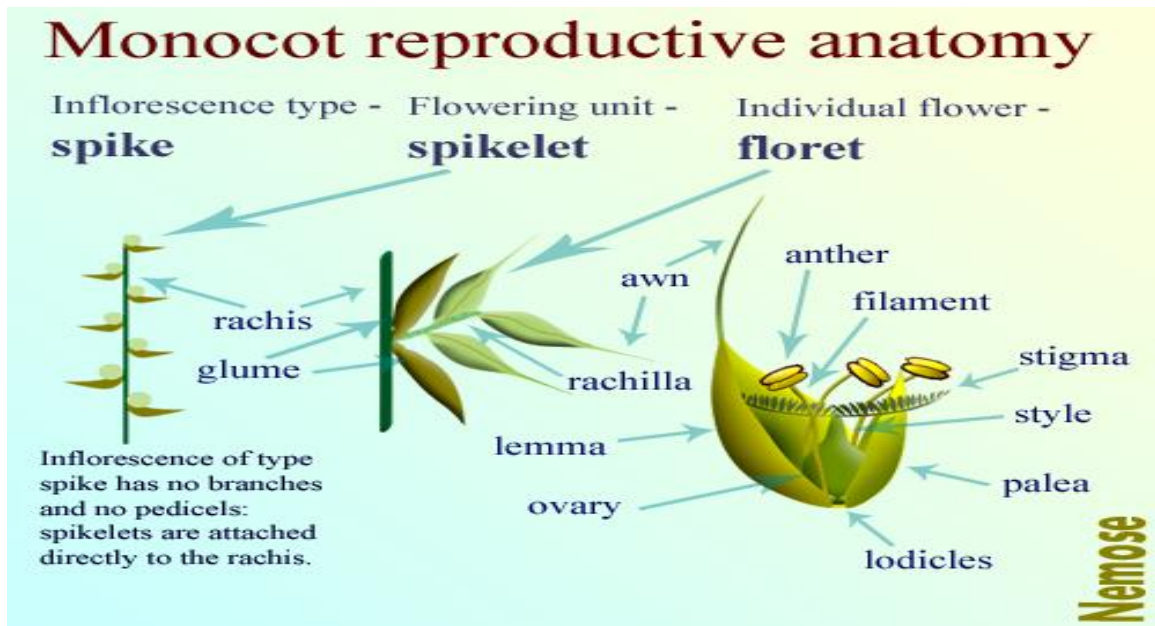
Family: **Poaceae**.

### Botanical characteristics:

Wheat is an annual herb. The stem is about of 60-150 cm which is differentiated into nodes and internodes. The stem produce tillers at the base. Roots formed in the seedling stage are ephemera and are soon replaced by adventitious fibrous. The inflorescence is spike which consists of 15-20 spikelets. The spikelets is enclosed by a pair of glumes and consists of 1-5 florets. Each floret has its own lemma and a thin palea, investing two lodicules, three stamens and a single pistil.

### Wheat cultivation:

Wheat is adapted to a variety of climates. Moderate annual rainfall of 330-900 mm. is most suitable for the crop. Wheat can be grown on all kinds of soils except saline or acidic soils.



## 2. Barley

Botanical name: (*Hordeum vulgare*).

Family : **Poaceae.**

### Botanical characteristics:

Barley is an annual herbs with 50-120 cm. high. It resembles with wheat in habit. The inflorescence is a dense terminal spike with three sessile spikelets. The grain is usually invested by a lemma and palea, on the basis of arrangement of spikelets in the inflorescences, species of barley can be classified into three categories:

- 1- **Six-rowed barley.**
- 2- **Irregular barley.**
- 3- **Tow-rowed barley.**

### Barley cultivation:

Barley has wide ecological adaption; it thrives best in cool climate and does not prefer hot and humid areas

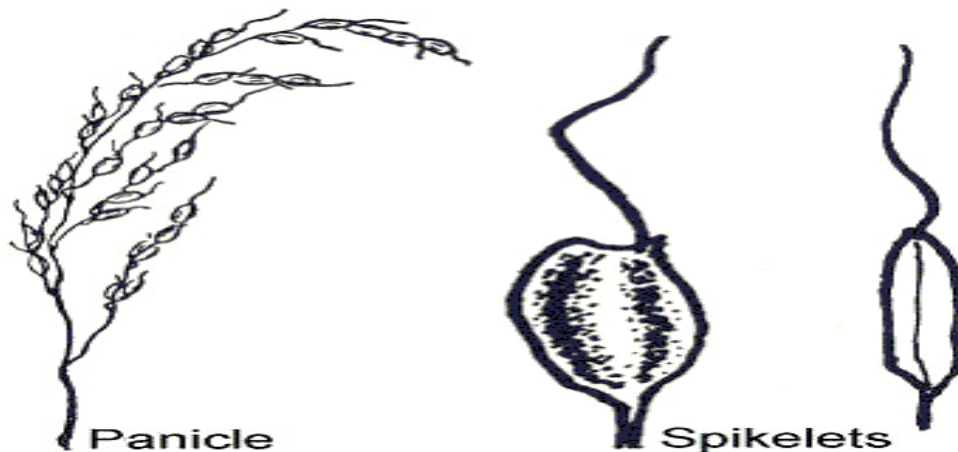
### 3. Rice or Paddy

Botanical name: *Oryza sativa*

Family: **Poaceae**

#### **Botanical characteristics:**

Rice is a staple food of south East Asia. It is an annual herb with a jointed stem (culm) 50-150 cm. high. The inter nodes are short in the basal region, but upwards they are long and hollow the culms are fully or partially covered by leaf sheaths. Tillers develop from the lower nodes of the stem. The flowers arranged in terminal panicles. Grains with husk are referred to as **paddy** and when husk is removed they are known as **rice**. Paddy consist about 20% husks.



#### **Paddy cultivation:**

It is best suited to the regions which have high temperature high humidity, prolonged sunshine and assured supply of water. The crop completes its life-cycle within 140-160 days.

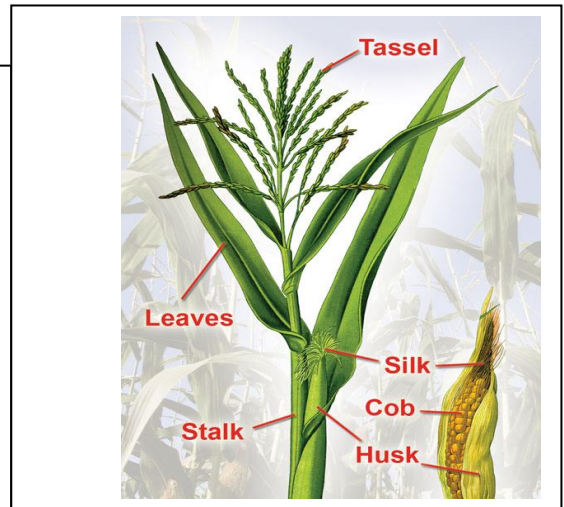
## 4. Maize (Corn)

Botanical name: *Zea mays*.

Family: **Poaceae**.

### Botanical characteristics:

Maize is an annual herbaceous plant, attaining a height of about 100-150 cm. The stem usually not branched or only a few tillers are present. Many adventitious roots are developed from the lower nodes of the culm. The maize plant are monoecious. The male inflorescence (tassel) occupies the terminal position on the main axis, whereas the female inflorescences (ear or cob) are borne on modified lateral branches in the axils of leaves.

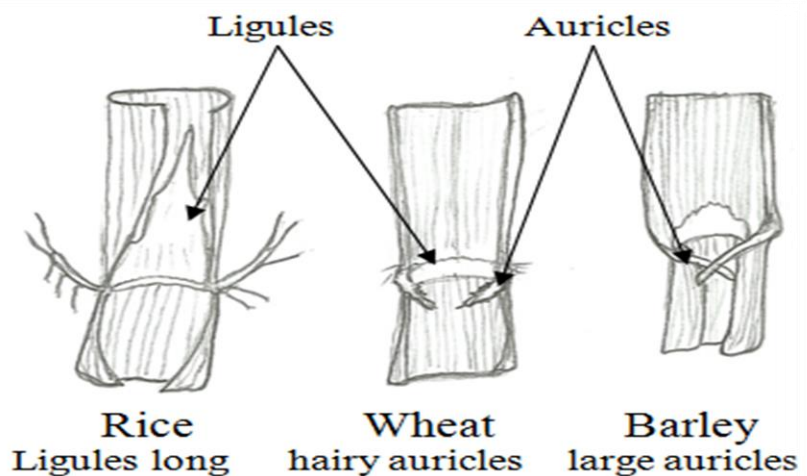


### Maize cultivation:

Maize is a sub-tropical and it is suitable for the areas with a temperature range of 21-27°C and annual rainfall of 600-1200 mm. The crop completes its life-cycle within about 140 days. The hybrid varieties take lesser time to mature. The crop is harvested when sheathes of cobs become brown and grain hard.



Corn (Maize)



## Pulse crops

All pulses belonging to family Fabaceae (Legume family) are an important protein source of vegetarian diet. Besides, they also serve as excellent foliage and cattle feed.

### 1. Broad bean (Horse bean)

Botanical name: *Vicia faba*.

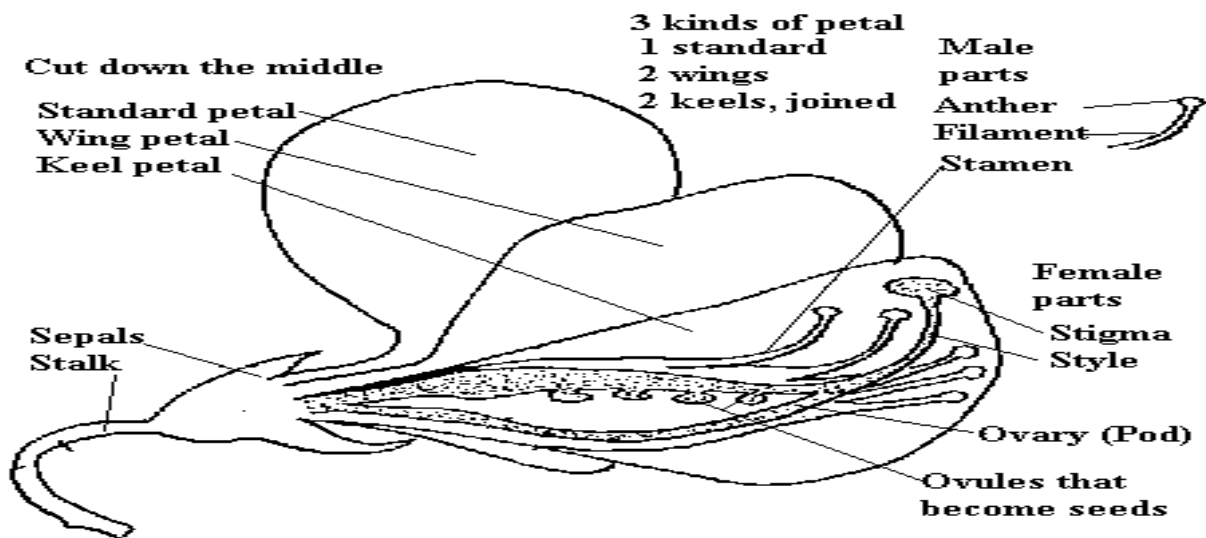
Family: **Fabaceae**.

#### Botanical characteristics:

Broad bean is an annual herb attaining a high of 30-80 cm. The leaves are compound with 3-7 leaflets. The stem usually four ribbed. The 2-3 white flowers. The pods are thick variable in size, about 10-30cm. The seeds are compressed from each sides, large, seeds dark chestnut when ripe.

#### 9.72.2 Legume flower

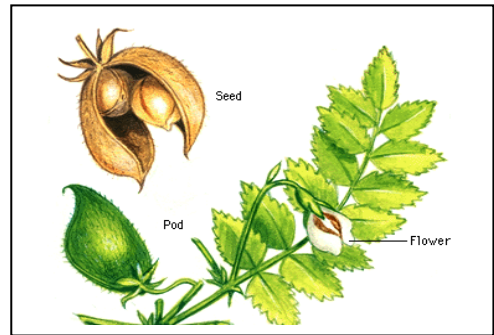
Winged bean *Psophocarpus tetragonolobus*



## 2. Chickpea

Botanical name: *Cicer arietinum*.

Family: **Fabaceae**.



### **Botanical characteristics:**

Chick pea is a much branched annual herb attaining high of 25-50 cm. The leaves are compound with 9-15 pairs of leaflets. The plant is covered with glandular hairs. The white to pinkish flowers are usually borne singly. The seeds are wrinkled or smooth and the cotyledons are thick and yellowish. Seeds sown broad cast or drilled in rows. At maturity, the plants are cut close to the ground when the leaves turn reddish brown.

## 3. Lentil

Botanical name: *Lens esculenta*.

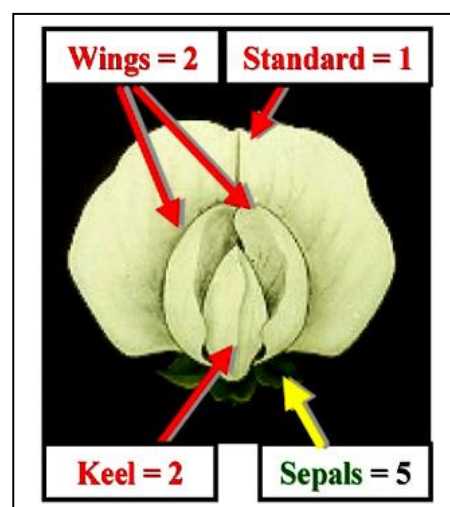
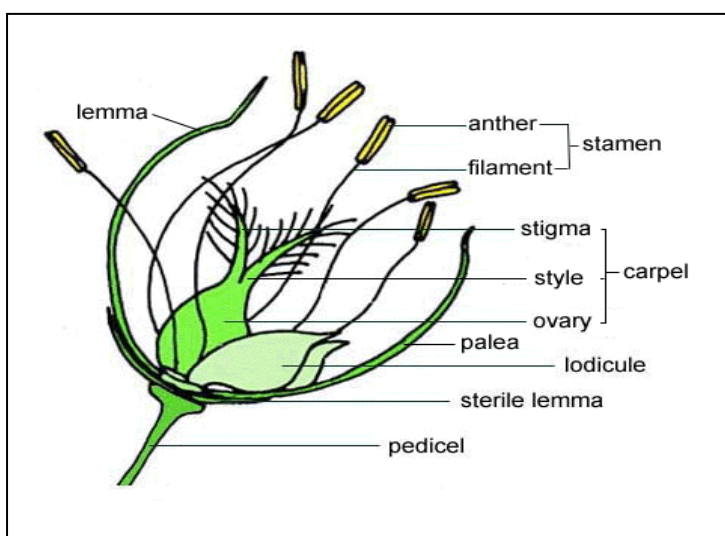
Family: **Fabaceae**.

### **Botanical characteristics:**

The plant is annual herb profusely branched, 25-40 cm. tall. The leaves are compound with 5-7 pairs of ovate leaflets, the upper leaflets terminating into tendrils. The white pinkish or blue-purple flowers are borne singly, the pods are short, and each contains two lens-shaped seeds. The seeds are brown, gray or red in color with yellow or deep orange cotyledon.

## Botanical deference between cereals and pulse crops

Plant parts	cereals	Pulse
<b>Class</b>	-Monocotyledon	-Di cotyledons
<b>Root</b>	-Fibrous, adventitious roots. Root nodules absent.	-Tap root Root nodules present.
<b>Stem</b>	-Stem is cylindrical, hollow.	-Stem erect or climbing.
<b>Leaves</b>	-Simple and parallel-veined. They consist of blade, sheath & ligules.	-Compound, Reticulate-veined, The lateral leaflet modified to tendril in some sp.
<b>Inflorescence Flower</b>	-Mostly lateral spike, or raceme. Perianth small, is highly modified and reduced, it consists of 2 fleshy lodicules. The lemma & palea bear a floret in there axillary.	-Mostly axillaries raceme. Papilionaceous, corolla: consists of 5 free petals (one posterior petal large called standard, two laterals once called wings, and two innermost ones, more or less united to form boat shaped called keel).
<b>Stamens</b>	Stamen 3 or multiples	Stamens 10 (9)+1 or 5+5



## Oil crops

Oils and fats are known to human since pre-historic times. The ancient Egyptians and Phoenicians used vegetable oils for food and for anointing their bodies.

### 1. Sunflower

Botanical name: *Helianthus annuus*.

Family: **Asteraceae (Compositae)** .

#### **Botanical characteristics:**

The plant is an annual herb or shrubs attaining 1-2m.High. The stem is tubers solid and hairy. The flowers are yellow, sessile and collected in a head .The head bearing two types of flowers, the tubular or **disc florets – bisexual-** and the peripheral neutral **ray florets**. The fruit is cypsela and crowned with hairy pappus. Seeds are non-endosperm. Harvesting is usually done when involucre bracts turn yellow. The heads are cut and spread out to sun light to drying.

### 2. Sesame

Botanical name: *Sesamum indicum*.

Family: **Pedaliaceae**.

#### **Botanical characteristics:**

The plant is an annual herb attaining a high of up to 2m. The flowers are solitary axillary or in groups of two or three. They are bell-shaped and pinkish-white. The fruit a bony capsule containing small seeds. The seeds are white-yellow or brown or black, compressed and somewhat pear-shaped. Seeds usually sown by broadcast method. They are mixed with sand or mature and facilitate sowing. The crop requires frost free days to grow, and matures within 100-140 days. Harvesting is usually done when leaves turn yellow and start drooping but capsules are still greenish.



## **Fiber crops**

After food plants, fiber plants are the most important in their usefulness to mankind. Since time immemorial man has been using fiber of plants origin for his clothing and many other needs.

### **1. Cotton**

Botanical name: *Gossypium* spp.

Family: **Malvaceae**.

#### **Botanical characteristics:**

Cotton is an annual herb, have branching stems, petioled and palmately lobed leaves, and showy flowers each with five sepals united in cuplike calyx and five petals whitish or yellowish color that often turn pink with edge. The boll or the capsule is containing the seeds, lint, and fuzz. The flowering started after 60-70 days of sowing, and the time from flowering to the opening of the boll about 45-65 days. When the boll is ripe, the capsule splits along the lines and the cotton pushing out beyond the walls of the capsule. Most of the cotton picked from the ripe bolls and carried in a sack suspended from the shoulder.

### **2. Flax**

Botanical name: *Linum usitatissimum*.

Family: **Linaceae** .

#### **Botanical characteristics:**

Flax is an annual herb. The sky-blue or white flowers in terminal racemes. The seeds are oval smooth and flattened with a shining yellow to reddish brown testa and a distinct raphe line along one edge. The crop grows best on clay loams; soil PH 6.6-7.6 is best suited to the plant. It is mainly grow as a mixed crop with gram, wheat, barley, mustard, etc. The crop matures in about 6-7 months. Harvesting is usually done by cutting the plants close to the ground.