

❖ Seed:-

- ❖ **Botanically** – ripened ovule containing embryo which is developed after fertilization of the eggs (Female) by the male gamete (Pollen) in the embryo sac of ovule in the ovary of flower.
- ❖ **Agronomy (Agriculture)** – Is the any part or organ of a plant which has the capability to regenerate a new plant and can be sown or distributed without much difficulty.

OR

Connecting link betn. two generation of plant species and responsible to maintain the quality of species.

During its development seed store the special type of food to be used for subsequent development of embryo in to seedling during germination.

Uses - Seed is used as food

For extraction of oil

For extraction of medicine

For propagation of new generation.

However some seeds are not used as food because of some poisonous substances present in it. Therefore the plants producing such are called “Obnoxious weed”.

Basic inputs in Agriculture:- Healthy, fully developed, harvested at right time maturity, properly dried, stored and handle with care seed are referred as Basic inputs in Agriculture.

Logic – Good seed will produce good progeny of new plant to initiate the

Seed Development

The development of seed starts with the process of pollination and then fertilization of male gamete(Pollen) with female gamete(Eggs).

Matured pollen grain

Enter through pollen tube
Via micropyle

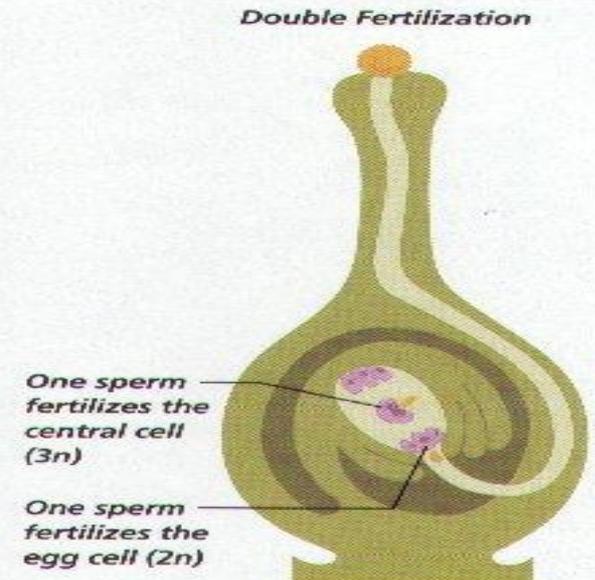
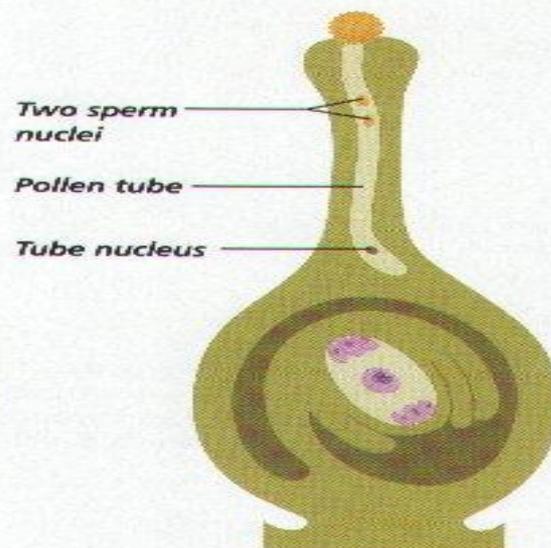
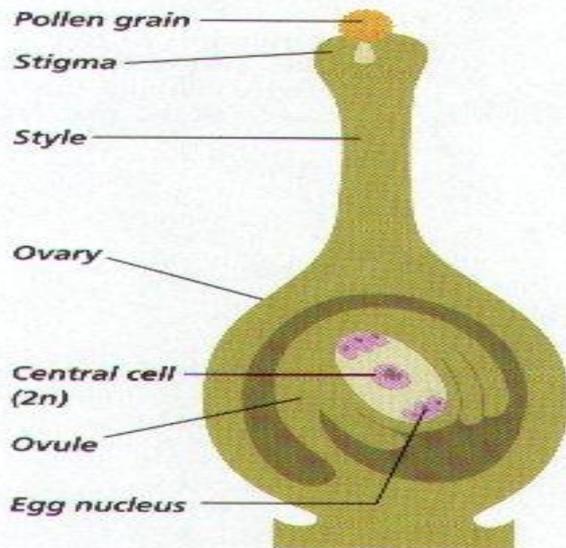
Embryo sac

Fertilization takes place

Release two Sperm Nucleus

One Sperm Nucleus +Eggs = Zygote(2n)

Another Sperm Nucleus +Two Polar nuclei= Endosperms (3n)



The zygote divides repeatedly by mitosis and differentiates into an embryo. The endosperm nucleus also divides by mitosis and forms the endosperm tissue, which provides food for the developing embryo.

Generally while studying the seed structure following parts of seeds are needed to be understood.

Seed coat:- It is formed from the integuments of ovule

Funiculus:- point of attachment of ovule to ovary

Hilum:- At the time of maturity a funiculus leaves a scar on seed

Micropyle:- The place left open by the integuments for entry of pollen tube

Parts of seed

1) Seed coat:- It is a protective coat made up of two layers

a) Testa:- It is outer thick layer

b) Tegma:- inner thin layer

It works as an envelop to protect the embryo and endosperm from desiccation, mechanical injury, effect of environmental factors and damage due to insect and micro-organism. It also helps in dispersal of seed.

2) Embryo:- It is a rudimentary plant part in axis with two tips

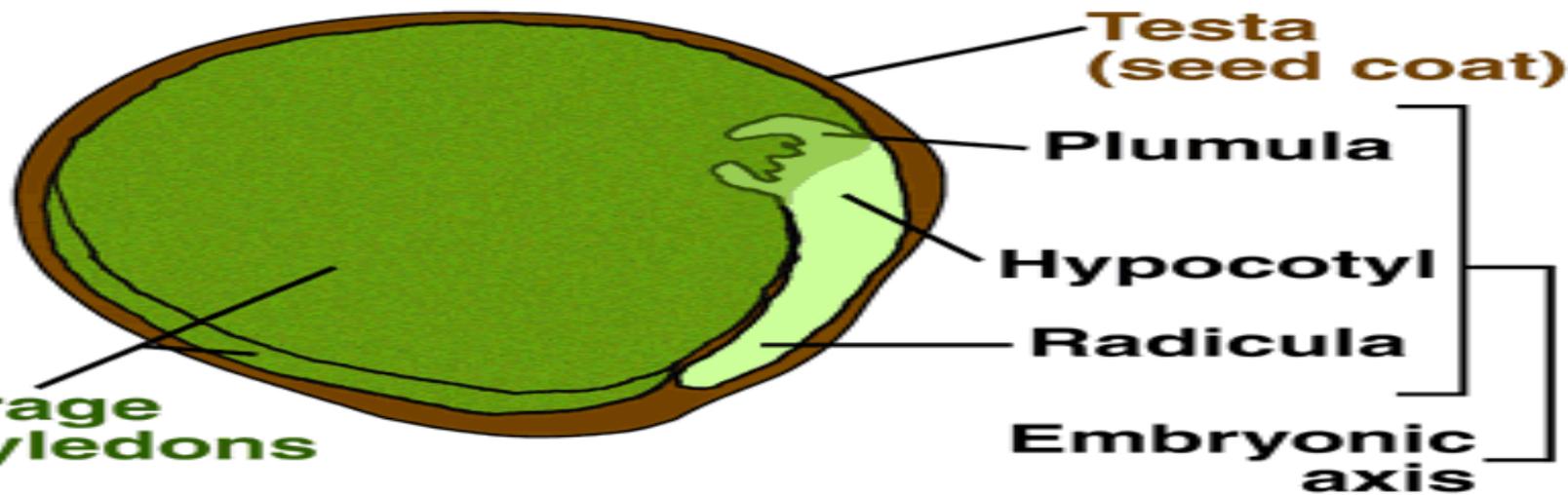
a) Plumule:- responsible to form shoot portion

b) Radicle:- responsible to form root portion

When the portion of embryonic axis extends

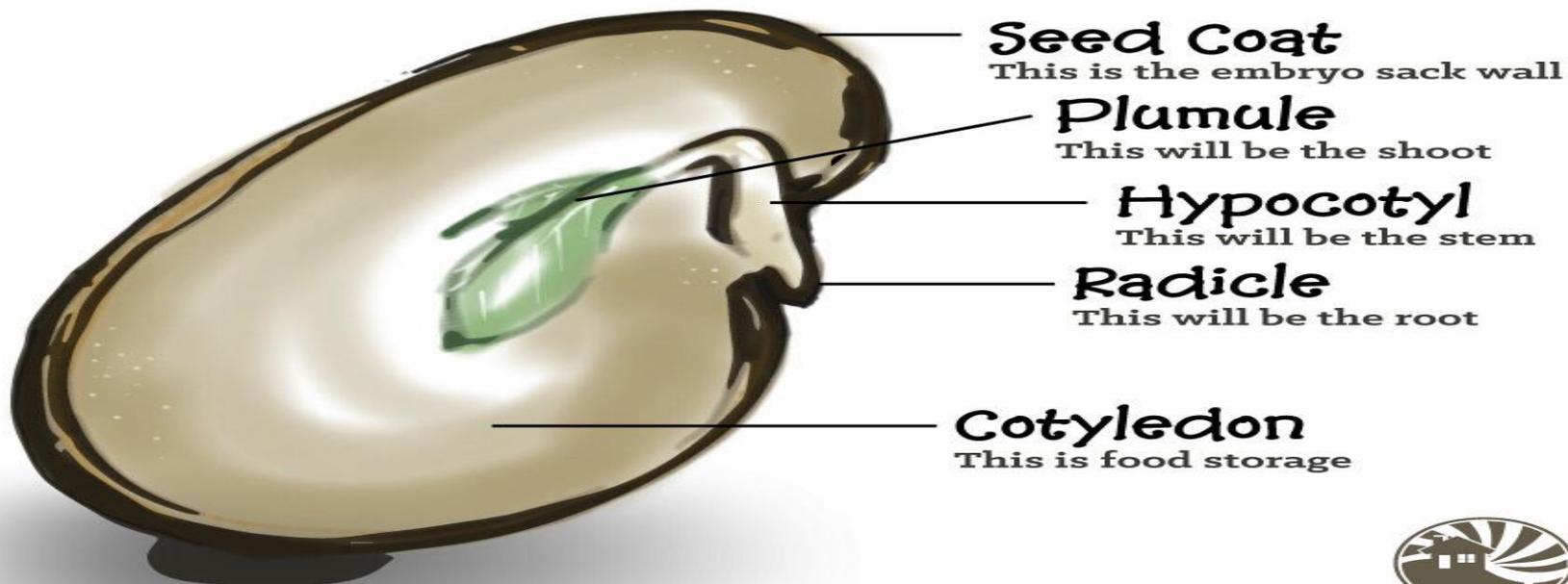
a) above soil called epicotyl

b) Below the soil called hypocotyl



Pisum sativum

Anatomy of a Seed



3) Endosperm (Foos storage) :- The endosperm is the tissue produced inside the seeds. It surrounds the embryo and provides nutrition in the form of starch, though it can also contain oils and protein. The endosperm also act as a source of nutrition in the human diet. For example, wheat endosperm is ground into flour for bread. On the basis of presence or absence of endosperm seeds are categorize in two groups

Albuminous seed:- Endosperm present

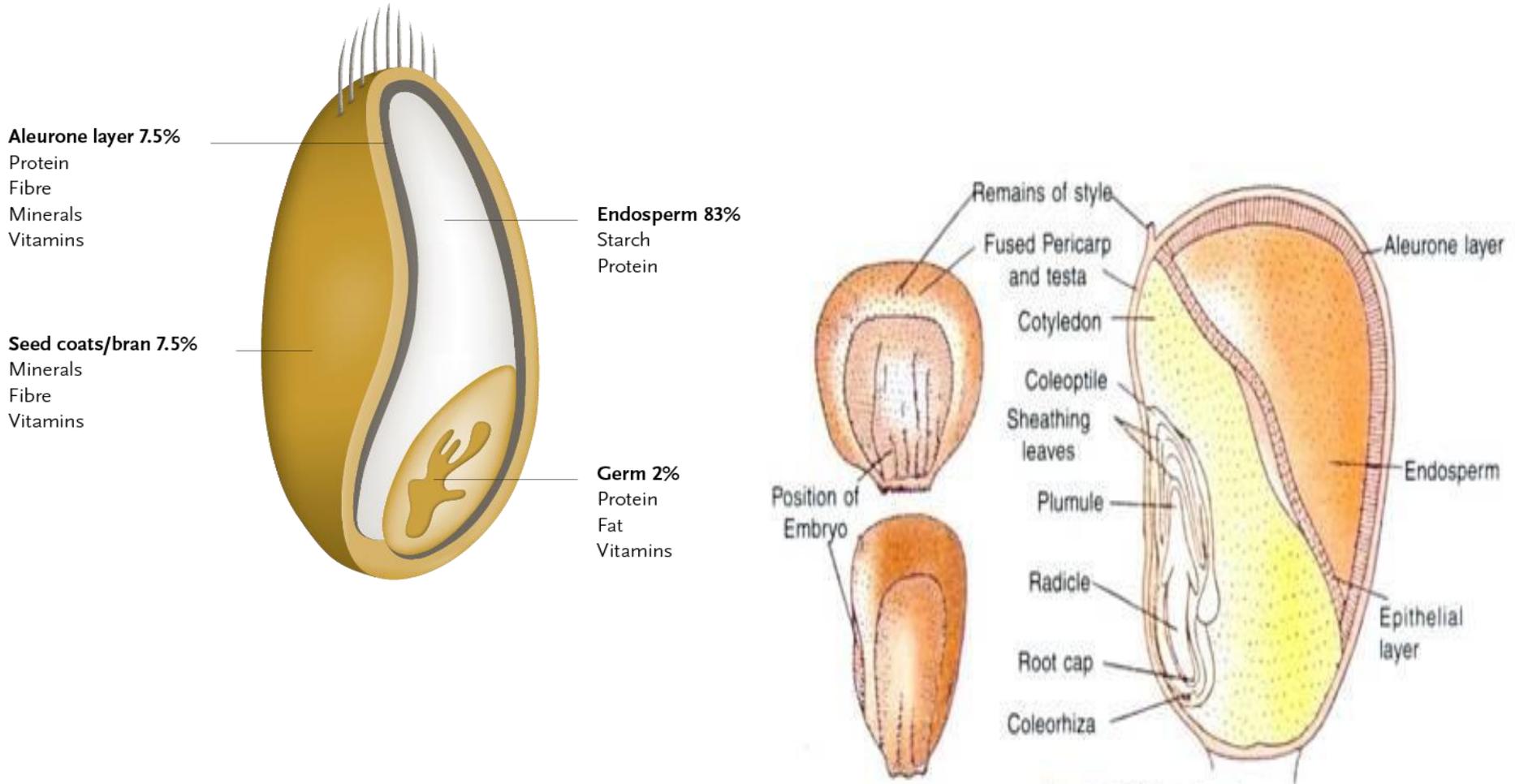
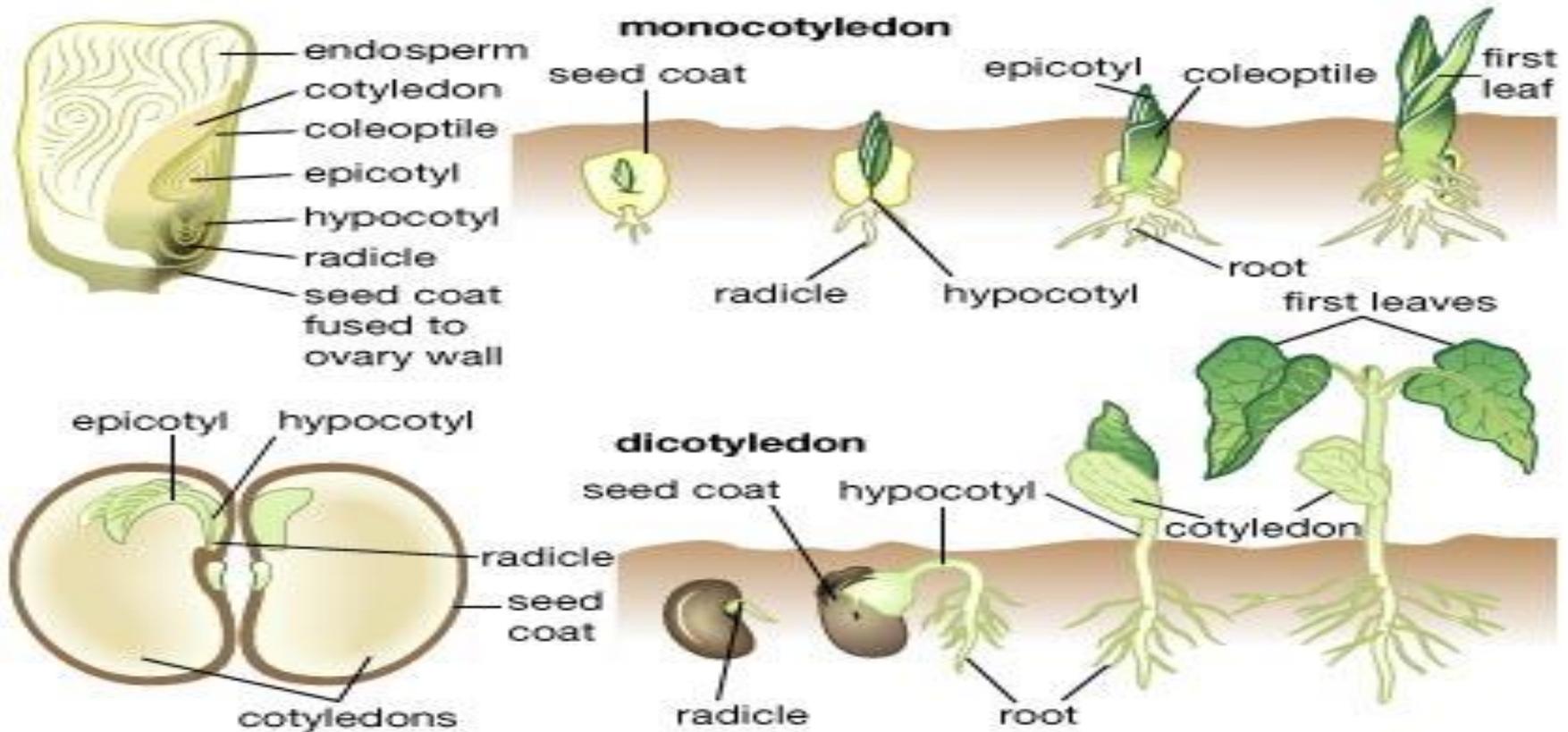


Fig. 3.1. Maize Seed.

4) **Cotyledon**:- A cotyledon is a significant part of the **embryo** within the **seed** of a **plant**, and is defined by the Oxford English Dictionary as "The primary leaf in the embryo of the higher plants. On the basis of number of cotyledon the crop species are divided in to two groups

Monocotyledonous:- One cotyledon

Dicotyledonous:- Two cotyledon



SEED TECHNOLOGY

- *The history of Agriculture development starts with the history of Seed**
- * In early days new seed material were achieved through the cultivation of useful plants and latter selection of superior type seed gives the new stage of progress. Mean time much useful selection were made by the scientist with the use of well-known technique of selection, Hybridization.**
- *It is observed that all the technical researches would be of less importance, unless he get genetically pure seed otherwise expected yield can not be obtained.**
- *Many inputs are used in agriculture but seed is the major one**
- *Seed forms smaller part of cultivation expenses but returns obtained are more.**
- *With out seed, expenses made on other inputs will be of no mining and cannot pay the invested capital.**
- *Good seed can be obtained from technically perfect person.**

Definition of seed technology:-

- 1) Cowen (1973) The discipline having the study of seed production, quality maintenance, Seed preservation.**
- 2) Feistrizer (1975):- It is the technique or method through which Genetic and Physical characters of seed can be improved. Involve Evaluation, Development, Variety release, seed production, certification, Processing, storage.**

Importance of Seed Technology or Role of Seed Technology

1) Seed is the carrier of new technology:-

Newly introduced varieties of good quality seeds when wisely combined with other inputs significantly increased the yield levels. Feistritz 1975 reported

112 % yield increased in cereals

124% in potatoes

142% in sugar beets in central Europe due to use of new varieties

2) Basic tool for food supply:-

Successful implementation of high yielding varieties programme in India has shown remarkable increase in production and has also given new direction for future development. As a result of this new import of food from other countries has been completely brought down in spite of rapid population.

3) Principle means to secure crop yield in less favorable area of production:-

The supply of good quality seed of improved varieties suitable to that area is one of the most important works but seed technology can make it possible to secure the crop areas.

4) Improved seed is the medium of rapid rehabilitation of Agriculture in case of natural disaster:-

Under the situation of natural calamities like earth quake, flood drought etc in the country then the country focused attention to get the relief. Under such condition the relief operation by FAO shows that it would be much more economical and beneficial if the Government had National Seed Reserve Stock at their disposal to establish the dispersed peoples.

Two roles of NSRS:-

1.They would provide the improved seeds in emergency period for rapid production of grains

2.They would supply good quality seeds to the disaster region for re sowing.

Goals of seed technology (Objectives)

- 1) **Rapid multiplication**:- The crop breeder should have take the keen interest in spreading improved and hybrid seeds develop by him.
- 2) **Timely supply**:- Improved and good quality seeds are made available to the farmers well in advance, so that the planting scheduled of farmer is not disturbed.
- 3) **Reasonable price**:- The cost of quality seed must be in reach of average farmer, so that the maximum farmers can purchase it easily.