

A seed is defined as an embryonic plant covered in a seed coat, often containing some food. It is formed from the ripened ovule of plants after fertilization. Seed formation completes the reproduction cycle in seed plants, which begins with the growth of flowers and pollination. The embryo grows from the zygote while the seed coat grows from the ovule rind.

A grain is a small edible fruit, usually hard on the outside, harvested from grassy crops. Grains basically grow in a cluster on atop the mature plant and they include wheat, oats, rice and barley. Because grains are generally grown on a large scale, they are considered staple crops and they are the number one energy providers worldwide.

Technically speaking, we can refer to a seed as an ovule containing an embryo within, while a grain is a fusion of the seed coat and the fruit. In some grains like peanut, the shell can be separated from the fruit to reveal the seed. However, in other grains like corn, the seed coat and fruit tissue cannot be separated.

A seed typically has three basic parts which are the embryo, seed coat and the endosperm. Obviously, the embryo is the most important part because it is its cells that eventually differentiate and grow into the various tissues that constitute the plant eventually. The seed coat and endosperm simply provide support, although they are critical to the embryo's development.

Grains provide food mainly from the fruit part, for instance, food from wheat grain is derived from the ground fruit, which is a part of the grain. In crops like millet, it is actually the seed that has properties very similar to those of the fruit part of the grains, and that is why it is handled as a grain in culinary terms.

Breeder seed

Breeder seed is produced from nucleus seed under the supervision of a qualified plant breeder in a research institute of Agricultural University. This provides for initial and recurring increase of foundation seed. Breeder seed is monitored by a joint inspection team of scientists and officials of certification agency and National Seed Corporation. The genetic purity of breeder seed crop should be maintained at 100 per cent.

Foundation seed

Foundation seed is the progeny of breeder seed and is produced by State Farm Corporation of India, National Seed Corporation, State seed Corporation under technical control of qualified plant breeders or technical officers. Its production is supervised and approved by certification agency. The genetic purity of foundation seed should be maintained at 99.5 per cent.

Certified seed

Certified seed is the progeny of foundation seed and its production is supervised and approved by certification agency. The seed of this class is normally produced by the State and National Seeds Corporation and Private Seed companies on the farms of progressive growers. This is the commercial seed which is available to the farmers and its genetic purity should be 99 per cent.

Differences between certified seed and truthful labelled seed

Certified seed	Truthful labelled seed
Certification is voluntary	Truthful labelling is compulsory for notified kind of varieties
Applicable to notified kinds only	Applicable to both notified and released varieties
It should satisfy both minimum field and seed standards	Tested for physical purity and germination
Seed certification officer, seed inspectors can take samples for inspection	Seed inspectors alone can take samples for checking the seed quality.

Seed Multiplication Ratio

It is nothing but the number of seeds to be produced from a single seed when it is sown and harvested. According to expert group of seeds (1989), the seed multiplication ratio for different crops are as follows.

SEED

VERSUS

GRAIN

SEED

Unit of reproduction of a higher plant, capable of developing into another such plant

An embryonic plant produced as a result of sexual reproduction

Three main components are embryo, endosperm, and seed coat

Fruit covers the seed of flowering plants; gymnosperms produce naked seeds without a fruit

Viability is important

Can develop into a new plant

Endosperm is used as food

May be treated with fungicides and pesticides

Ex: pumpkin seeds, sunflower seeds, and

GRAIN

A single fruit or seed of a cereal used as food

A type of seed or fruit which occurs mainly in grasses

Four components are embryo, endosperm, seed coat, and bran

Contain a fusion of the seed coat and the fruit

Viability is not important

Used as a food

Fruit part is used as food

Not treated with fungicides or pesticides

Ex: rice, wheat, corn, and oats