MARUMEGH

Kisaan E- Patrika

Available online at www.marumegh.com

 ISSN: 2456-2904

QUALITY SEEDS AND ITS IMPORTANCE IN AGRICULTURE

Neelam Shekhawat[1], Kartar Singh[1] and D. R. Meghawal[2]

[1]ICAR-National Bureau of Plant Genetic Resources, Regional Station, Jodhpur (Rajasthan)-342005

[2]Nodal Officer, AC & ABC Scheme, Rangbadi Kota, recognized by MANAGE Hyderabad.

Introduction:

Seeds are the foundation of agriculture. The use of high quality seeds is one of the most important elements in increasing agricultural production in any farming system. Technology has modernized day-to-day operations of the farming, but steady supply of high-quality seed, yields and crop quality would be equally responsible. This element has become more crucial than ever for providing enough food security for the rising number of people in the world, which is expected to exceed nine billion by year 2050. Selecting high yielding varieties adapted to the area of production, with disease, insect, lodging, and shattering resistance, along with other desirable characteristics are basic keys for satisfactory crop performance and yield. The production of high quality seed is the cornerstone of any successful agriculture program. It is also a good marketing tool for increasing the potential sale of crops, especially in today's competitive market.

What is a seed?

The practical definition of seed quality can differ depending on the end user. For example, a farmer may desire high-quality seed that produces rapid uniform plants with high yielding capacity under a wide range of field conditions. A producer of oil seed crop, where oil would be used for industrial purposes such as making soap, cosmetic products or lubricants may desire seed with a particular stable fatty acid profile as a measure of high quality.

Seed is a fertilized matured ovule together covered with seed coat is called seed or it is a propagating material *i.e.*, part of agriculture, sericulture, silvicultureand horticultural plants used for sowing or planting purpose. Seed is botanically fertilized and ripened ovule, structurally an embryonic plant together with stored food surrounded by a protective coat, genetically dormant plant the link between two generations and on usage it is a preparative material.

Seed is a material which is used for planting or regeneration. It may be sexually produced matured ovule consisting of an intact embryo, endosperm and or cotyledon with protective covering (seed coat). It also refers to propagating materials of healthy seedlings, tuber, bulbs, rhizome, roots, cuttings, setts, slips, all types of grafts and vegetative propagating materials used for production purpose.

What is quality seeds?

In general, the quality of seeds is measured in many ways, including genetic and physical purity, germination, vigour, uniformity in sizes, freedom from seed-borne diseases and any other factors that may affect seed performance in the field. Examples of the factors that affect seed quality are heat, mechanical damage, and pre-harvest sprouting. Therefore, seed quality is a collective term for the conditions of seeds including genetic and physical

purity, viability, vigour and seed health. Other characteristics such as specific chemical composition or resistance to certain diseases or insects also contribute to the quality of seeds.

Characteristics of good quality seed:

1. High genetic purity (true to type seeds)
2. Free form other crop seeds: designated inseparable crop seeds are the plants seeds cultivated crops found in the seed fields and whose seeds are so similar to crop seed that is difficult to separate them economically by mechanical means, cause physical admixtures with the crop seeds only when these crop mature approximately at the same time when seed crop matures.
3. Free from objectionable weed seeds: Objectionable weed seeds are seeds of weed species which are harmful in many ways *viz.,* the size and shape of weed seeds are similar to the crop seed and difficult to separate them by mechanical means,weed's growth habit is determinate type and compete with the crop for all resources,weed plant parts are poisonous or injurious to human and animals, weed plants also serves as alternative hosts for pests and diseases. Thus quality seeds should be free from objectionable wee seeds.
4. Free from designated diseases: it refers to the diseases specified for the seed certification which may cause contamination of seed lot.
5. Good shape, size, colour *etc.* according to the specification of the variety.
6. Minimization of seed/seedling rate *i.e.* fast and uniform emergence of seedling.
7. They can be adopted themselves for extreme climatic condition and cropping system of the location.
8. Germination, vigour and stamina should be high.
9. Optimum moisture content of the seeds for safe storage.
10. High produce value and their marketability.
11. The good quality seed has high return per unit area as the genetic potentiality of the crop can be fully exploited.

Characteristics of seed type:

Nucleus Seed: It is the initial & lowest quantity of pure seed of an improved variety and generated by original breeder. More than one variety of the same crop is to be grown for production of nucleus seed, then proper isolation distance must be maintained to retain the purity. It is genetically 100 % pure. It requires no tag due to be conserved with so restrictions. A pedigree tag can be issued by the producing breeder.

Breeder seed: It is the progeny of nucleus seed, also maintained by original breeder along with either agricultural university or research institute. It is also 100 % pure. A golden yellow tag with length of 12cm & width of 6 cm is issued for this category of seed by the producing breeder.

Foundation seed: It is the progeny of nucleus or breeder seed, produced and maintained by recognized seed producing agencies in such a way that its quality is maintained according to prescribed field and seed standards. A white colour tag is issued for foundation seed by seed certification agencies.

Registered seed: The progeny of the foundation seed so handled as to maintain its genetic identity and purity and approved and certified by a certifying agency. It should be of quality suitable to produce certified seed.

Certified seed: It is the progeny of either foundation or registered seed, produced for mass multiplication among the common farmers and approved by seed certifying agency. A blue colour tag is issued by seed certification agency with length of 15cm & width of 7.5cm for this category of seed. It should have the minimum genetic purity of 99%.

Agencies involved in seed production

Class of seed	Tag colour	Quality control system	Agency involved
Nucleus seed	No specific tag	Maintenance breeding	Concerned breeder himself
Breeder seed	Golden yellow tag	Monitoring team field inspection to check the genetic purity by grow out test	Concerned breeder or sponsoring institute
Foundation seed	White tag	Field inspection and testingby State Seed Certification Agency testing for checking required physical and quality standards	State agriculture departments, National seed corporation, cooperative agencies, central and state seed corporations, private sector agencies.
Certified seed	Azure blue tag	Field inspection and testing by State Seed Certification Agency testing for checking required physical and quality standards	State agriculture departments, National seed corporation, cooperative agencies, central and state seed corporations, private sector agencies.
Truthfully labelled seed	Open green tag	Farm use	Farmers or producers

General principles of seed production

1. Genetic principles: The main aim of seed production is to produce genetically pure and good quality seed. But how the genetic purity of a variety is lost or deteriorated during seed multiplication. The several factors that are responsible for loss of genetic purity during seed production as listed by Kadam (1942) are:

a) Developmental Variations	e) Selective Influence of Disease
b) Mutation	f) Techniques of Plant Breeder
c) Natural Crossing	g) Breakdown of male sterility
d) Minor Genetic Variation	h) Improper Seed Certification

2. Agronomic Principles of Seed Production

a) Selection of Suitable Agro climatic Zone	b) Selection of the variety	c) Method of Sowing
d) Selection of Land	e) Seed	f) Preparation of the land
g) Isolation Distance of the Seed Crop	h) Seed Treatments	i) Time of Sowing / Planting
j) Seed Rate	a) Supplementary Pollination	b) Nutrition of the Crop
c) Depth of Sowing	d) Intercultural operation	e) Irrigation
f) Rouging	g) Disease -Pest Control	h) Harvesting
i) Drying of Seed	j) Seed Testing	k) Bio fortification & Bio priming

Seed Replacement Rate (SRR):

Seed replacement Rate (SRR) is the quantity of quality seed that have replaced the actual seed requirement of the location that are normally produced by the farmer using their own seed.

SRR = a/b X 100

Where a = Quantity of quality seed/used in an area or location

b = Quantity of quality seed (certified) required for the entire production area /location

Seed multiplication ratio:

It is the ratio of seed produced from single seed. i. e. many seeds are produced from a single seed. It varies with crop based on its genetic ability. But can be altered by environment and management factors.

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