

Life span of a variety and causes for its deterioration; certification standards for self and cross pollinated and vegetative propagated crops.

Introduction



- The main aim of seed production is to produce genetically pure and good quality seed.
- Variety: Is a group of plants having clear distinguished characters which when reproduced either sexually or asexually retains these characters
- Basically hybrid seeds need to be replaced every year to maintain the constancy as well as higher in its yield.
- And the varieties losses their existence by the following causes,

Factors responsible for loss of genetic purity (Kadam ., 1942)

- **Developmental Variation**
- **Mechanical Mixtures**
- **Mutations**
- **Natural Crossing**
- **Genetic drift**
- **Minor Genetic Variation**
- **Selective influence of Diseases**
- **Techniques of the Breeder**
- **Breakdown of male sterility**
- **Improper / defective seed certification System**

Maintenance of Genetic Purity during seed Production

Horne (1953) had suggested the following methods for maintenance of genetic purity;

1. Use of approved seed in seed multiplication
2. Inspection of seed fields prior to planting
3. Field inspection and approval of the Crop at critical stages for verification of genetic purity, detection of mixtures, weeds and seed borne diseases.
4. Sampling and sealing of cleaned lots
5. Growing of samples with authentic stocks or Grow-out test

Steps suggested by Hartman and Kestar (1968) for maintaining genetic purity

1. Providing isolation to prevent cross fertilization or mechanical mixtures
2. Rouging of seed fields prior to planting
3. Periodic testing of varieties for genetic purity
4. Grow in adapted areas only to avoid genetic shifts in the variety
5. Certification of seed crops to maintain genetic purity and quality
6. Adopting generation system

Safe guards for maintenance of genetic purity

1. Control of seed source
2. Preceding crop requirement
3. Isolation
4. Rouging of seed fields
5. Seed certification
6. Grow out test

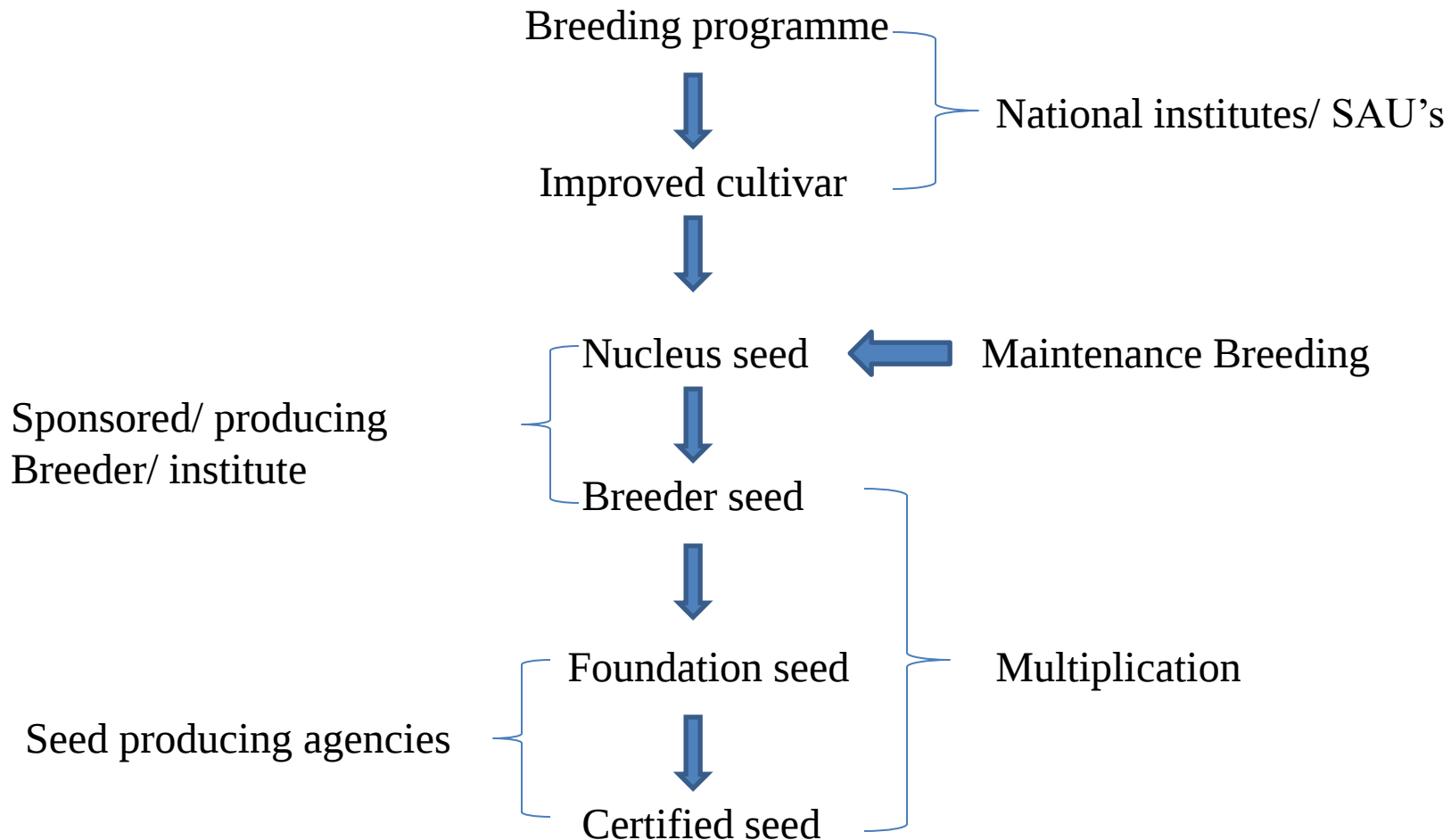
Control of Seed Source

- ❖ Appropriate class from the approved source for raising a seed crop.

There are four classes of seed from breeder seed, which are given and defined by Association of Official Seed Certification agency (AOSCA).

- Nucleus Seed
- Breeder Seed
- Foundation Seed
- Certified seed

Scheme showing cultivar breeding , maintenance and multiplication in India



Preceding Crop requirement

This has been fixed to avoid contamination through volunteer plants and also the soil borne diseases.

Isolation

- Isolation is required to avoid natural crossing with other undesirable types, off types in the fields and mechanical mixtures at the time of sowing, threshing, processing and contamination due to seed borne diseases from nearby fields.
- Protection from these sources of contamination is necessary for maintaining genetic purity and good quality of seed.

Rouging of Seed Fields:

The existence of off type plants is another source of genetic contamination. Off type plants differing in their characteristics from that of the seed crop are called as off types. Removal of off types is referred to as roughing

The main sources of off types

- a. Segregation of plants for certain characters or mutations
- b. Volunteer plants from previous crops or
- c. Accidentally planted seeds of other variety
- d. Diseased plants

Off type plants should be rouged out from the seed plots before they shed pollen and pollination occurs. To accomplish this regular supervision of trained personnel is required.

Seed Certification

- ❖ The main objective of seed certification is to make available seeds of good quality to farmers.
- ❖ To achieve this qualified and trained personnel from SCA carry out field inspections at appropriate stages of crop growth.
- ❖ They also make seed inspection by drawing samples from seed lots after processing.
- ❖ The SCA verifies for both field and seed standards and the seed lot must confirm to get approval as certified seed.

Grow-out Test

- ❖ Varieties that are grown for seed production should be periodically tested for genetic purity by conducting GOT to make sure that they are being maintained in true form.
- ❖ GOT test is compulsory for hybrids produced by manual emasculation and pollination and for testing the purity of parental lines used in hybrid seed production.

Eligibility Requirements for Certification of Crop Varieties

Seed of only those varieties which are notified under Section 5 of the Seeds Act, 1966 shall be eligible for certification.

Classes and Sources of Seed

A. Breeder Seed:

Breeder seed is seed or vegetative propagating material directly controlled by the originating or sponsoring plant breeder of the breeding programme or institution and/or seed whose production is personally supervised by a qualified plant breeder and which provides the source for the initial and recurring increase of Foundation seed.

B. Certified Seed:

Certified seed shall be the seed certified by Certification Agency notified under Section 8 of the Seeds Act, 1966 or seed certified by any Certification Agency established in any foreign country provided the Certification Agency has been reorganized by the Central Government through notification in the Official Gazette. Certified seed shall consist of two classes, namely, Foundation and Certified seed and each class shall conform to the following description:

Certified Foundation seed shall be the progeny of Breeder seed, or be produced from Foundation seed which can be clearly traced to Breeder seed. Thus, Foundation seed can even be produced from Foundation seed. During the production of certified Foundation seed, the following guidelines shall be observed:

- (a) Certified Foundation seed produced directly from Breeder seed shall be designated as Foundation seed stage-I;
- (b) Certified Foundation seed produced from Foundation seed stage-I shall be designated as Foundation seed stage-II;
- (c) Certified Foundation seed stage-II will not be used for further increase of Foundation seed and shall be used only for production of Certified seed class;

(d) Minimum Seed Certification Standards shall be the same for both Foundation seed stage I and II unless otherwise prescribed;

(e) Certification tag shall be of white colour for both Foundation seed stage-I and II and shall contain the information as to its stage;

(f) Production of Foundation seed stage-II shall ordinarily be adopted in respect of such crop varieties provided, when it is expressly felt by the Certification Agency that Breeder seed is in short supply;

(g) Production of Foundation seed stage-II may be adopted for the following group of crops:

- vegetatively propagated crops;
- apomictically reproduced crops;
- self-pollinated crops;
- often cross-pollinated and cross-pollinated crops, these being gene – pools should not lose their genetic identity and purity if measures to safeguard the same are adequately taken;
- composite and synthetics;
- parental line increase of hybrids.

Phases of Seed Certification

Certification shall be completed in six broad phases listed as under:

- (a) receipt and scrutiny of application
- (b) verification of seed source, class and other requirements of the seed used for raising the seed crop
- (c) field inspections to verify conformity to the prescribed field standards;
- (d) supervision at post-harvest stages including processing and packing;
- (e) seed sampling and analysis, including genetic purity test and/or seed health test, if any, in order to verify conformity to the prescribed standards; and
- (f) grant of certificate and certification tags, tagging and sealing.

Field inspection

- (a) The field inspection work which requires technically-trained personnel, shall be performed by the persons who have been so authorized by the Certification Agency;
- (b) Field inspection meant to verify those factors which can cause irreversible damage to the genetic purity or seed health shall be conducted without prior notice to the seed producer;
- (c) Soon after the completion of the field inspection, a copy of the report shall be handed over to the seed producer or his representative.

Re-inspection

Seed fields not conforming to prescribed standards for certification at any inspection, the Certification Agency shall, upon the request of seed producer and after he removes the sources of contamination in the seed field and within the prescribed isolation distances and/or the contaminated plants in the seed field (if so directed by the Certification Agency perform one or more re-inspections provided such removal can ensure conformity of the seed crop to the prescribed standards and provided further that no irreversible damage has been caused to the quality of seed by the contaminant(s). The Certification Agency may at its discretion, also perform one or more re-inspections over and above the minimum number of inspections prescribed, if considered necessary



Thank you...