Centurion University

Variety Development, Evaluation, Testing & Release

Dr. Prabhat Kr. Singh

Assistant Professor,
Department of Genetics and Plant Breeding
MSSSoA, CUTM, Paralakhemundi, Odisha, India

Testing, release and notification of varieties

Variety:

- Botanically a variety is a sub group of a species. According to seed act (1966, sub section 16 of section 2) it is a sub division of a kind identified by its growth, yield, plant fruit, seed or other characters.
- Where as seed technology considers a group of plants uniform in their morphological, physiological, biochemical and other characters without any variation from generation to generation and can be differentiated from other groups of plants of the same species by some distinguishing characters as variety after its release and notification.

- In India, new improved varieties of crops are developed by Crop Research Institutes of Indian Council of Agricultural Research, State Agricultural Universities and few Private Seed Companies.
- These varieties are **tested (evaluated) for a minimum period of three years**, before consideration of release for cultivation.
- The important characters for which the new varieties are evaluated / tested are:
  a) Yield
  b) Resistance to disease and pests
  c) Quality of product
  d) Resistance to adverse environmental factors (viz. drought)
  e) Adaptation to different agro climatic conditions

Steps involved in the development of a variety

Plant breeding method

↓

Development of a strain

↓

Identification by the workshop for particular zone

↓

Testing under AICRP

↓

Multilocation trials in the state / zone of adoption

↓

Release of variety by state / central Govt.

↓

Notification of the variety by GOI

↓

Seed production through seed multiplication chain

↓

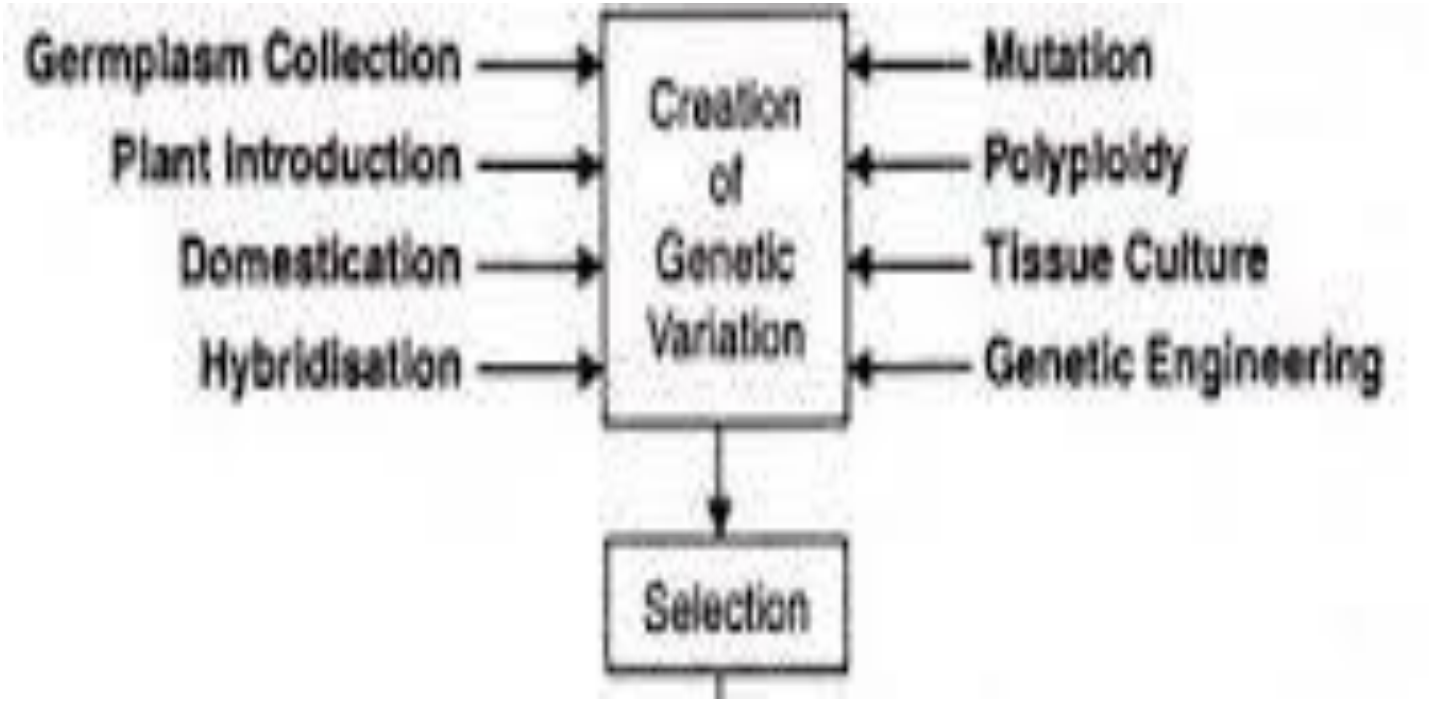
Use of certified seed by the farmers

In India, the release of new crop varieties consists of four major steps

1. Development of new strains
2. Evaluation of performance
3. Identification of superior strains and
4. Release and notification

1. Development of new strains

The new strains are developed by ICAR crop research institutes and state agricultural universities for specific purposes. Various breeding methods are used for development of new strains in self and cross pollinated species



2. Evaluation of performance

- The performance of newly developed strains is evaluated in All India Coordinated Crop Improvement Project (AICCIP), ICAR institutes, SAUs and private registered seed companies enter their improved strains / hybrids in the AICCIP of respective crop for multilocation testing.
- The new strains are **tested at multilocation** under the AICCIP of concerned crop for **a minimum period of three years / seasons.**
- The new variety is first tested for yield under the initial varietal trials (IVT) for one year and for two years under Advanced Varietal Trials (AVT).
- The strains that give good performance in AVT for two years are selected.

3. Identification of superior strains

- The strains which show good yield performance in AVT are identified as superior strains and are considered for release in the workshop meetings.
- The new agro and plant protection techniques required to obtain potential yield of new strains are also worked out by that time.
- The workshop after considering the new promoting varieties recommend them to replace existing varieties.

4. Release and notification

- The proposal for release of new varieties is put up in a prescribed proforma to variety release committee viz, **state variety release committee (SVRR) and central variety release committee (CVRC).**
- In case of SVRC, Director of Agriculture for field crops and Director of Horticulture for vegetable and horticulture crops is the chairman. In CVRC, Deputy Director General (Crop Science) of ICAR is the chairman.
- The release proposal of varieties recommended for All India release is put up before CVRC, while for those for a particular state is placed before the SVRC of respective state.
- These committees consist of scientists and representatives of seed producing organizations (NSC, SSC and SSCA) and other related govt. agencies
- After release, the variety is notified.
- Seed production can be taken up only after notification of new varieties.
- The notification is done by the govt. of India.

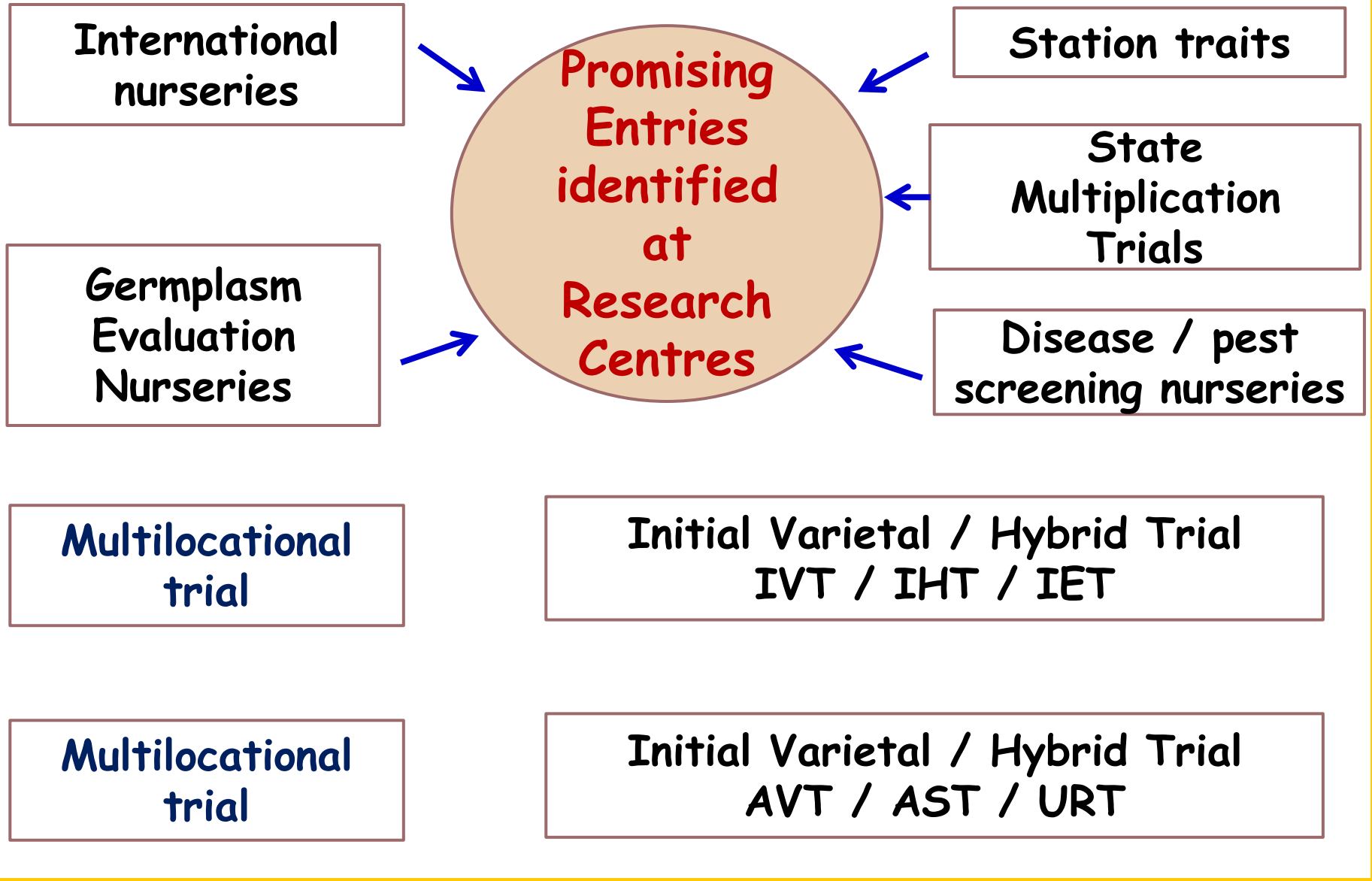
GENERAL PROCEDURE FOR VARIETY TESTING

- In general 7 different types of trials/ tests conducted during evaluation to determine the superiority of new strain over the best existing variety in term of yield and other agronomic traits, and its stability for consumption.

    1. **Station trial**
    2. **Multilocation trial**
    3. **National trial**
    4. **Adoptive trial**
    5. **Minikit trial**
    6. **Disease and insect test and**
    7. **Quality test**

- In all these trials, the best existing varieties (3 Varieties) are included as **CHECK** for comparison

General procedure for variety testing



Agronomic trails / Adoptive trails

Test Stock Seed Multiplication

Minikits, On farm trials, Demonstrations

Variety Identification

Variety Release

Farmer's field

1.Station trial

- It is conducted **by the breeder** who develops the variety.
- It is conducted **for one or more years** before it is entered in the trial conducted under All India Coordinated Crop Improvement Project.
- The objective of station trial is to make sure that the **new stains are superior in performance** (at that location) to the best available variety for the region.
- In station trial of **wheat, the plot size is generally 5m X 1.84m with spacing of 23** cm between rows. But, plot to plot spacing is not maintained.
- **Number of replication** should not be less than **3-4**.
- Disease reaction and quality are also evaluated
- **The data from station trial are not required** for the inclusion of a strain in multilocation trial; except wheat.

2. Multi-location Trials

- These trials are **carried out under respective AICCIP**.
- The objective of this trial is **to evaluate the performance** of newly developed strain **at several agroclimatic zones**.
- The no. of zones for a crop varies from **one (Jowar and Bajara), two (Rajma and Sunflower) to nine (Wheat and Chickpea)**.
- In case of wheat following trials are conducted under coordinated project.

1. **Initial Evaluation Trials (IET)-** Strain included here is termed as **Entry** and evaluated **for only one year**. Conducted at **10-12 location** within a zone. In IET plot size and no of replication in case of wheat are 6X1.38m and 6 respectively. The objective of IET to eliminate the inferior entries to make it manageable size for URT evaluation.

2. **Uniform Regional Trials (URT)-** The selected entries from IET promoted to URT for evaluation. **At 25-30 different location** within the zone URT conducted. The plot size and no of replication in case of wheat are 6X2.76m and 6 respectively. Evaluated for one or more year.
3. **Agronomic trials-** An entry showing superior performance during first year in URT is included in agronomic trial. Its **objective is to determine suitable date of sowing and the optimum no of irrigation. plot size and no of replication** in case of wheat are **10X1.61m and 3** respectively.
4. **Model Agronomic Experiment-** Conducted under the **All India Coordinated Agronomic Research Project** (and not under coordinated project). Here only those entries are included that have been identified by the workshop of the respective coordinated project.

3. National Trials

- Conducted through out the country in all the zones.
- The purpose of national trials is to evaluate outstanding entries of one zone in the other agroclimatic zone to see if they perform well in other zone as well.

4. Adoptive Trial

- Conducted on research station or farm of state government.
- The entries identified by the workshop of the respective coordinated project are included in this trial.
- **Plot size is 0.5 acre (0.2 hectare) and there is no replication.**
- The data from these trials are considered for release of the identified entry as new variety.

5. Minikit Trials

- Conducted **in farmers field** along with adoptive trials in the crop season.
- Conducted under supervision of Director, HYV, Ministry of .Agriculture and Irrigation, GOI.
- Conducted **at 300-400 places** within the zone.
- **In wheat, 5kg of seed** of each variety is planted without any replication.
- The objective of minikit trials is **to popularise the new variety among the farmers** of the zone.
- It also serve another purpose ; **the seed of a good new variety reaches the farmers one year earlier** than when its certified seed would be available in the market.

Variety Development, Evaluation, Testing & Release in India