

LECTURE THREE

Seed Multiplication Chain

Seed is multiplied in controlled stage until the desired quantity is achieved. Each stage is assigned a class for identification such as breeder seed, foundation seed and certified seed. In self-pollinated crops or in crops having a low multiplication ratio, it may be expedient to have two classes of foundation seed instead of one: i.e foundation and registered seed.

Breeder seed

Seed or vegetative propagating material directly produced or controlled by the originating plant breeder or institution. Breeder seed provides the source for the increase of foundation seed. It is usually limited in quantity.

Foundation seed

Also known as elite or basic seed. It is the direct increase form breeder seed. The genetic identity and purity of the variety is carefully maintained in foundation seed. Foundation seed is the source of certified seed.

Certified seed

Certified seed is the progeny of foundation seed. Each variety requires unique treatment for its continued maintenance, though the treatment may be relatively simpler in self-pollinated crops than in crop which are largely cross-pollinated. Before attempting to produce a variety, it is imperative to familiarize with its:- reproduction behavior

- Reaction to diseases, day length and to
- Varietals type (pure line, open-pollinated, hybrid etc.)

In multiplying self-pollinated and cross-pollinated crop varieties.

- producing breeder seed of recommended variety.

- Building up pure foundation seed.
- Avoiding mechanical mixture.
- Removing off- type plants.
- Proper seed processing, handling and storage.

In addition, for cross pollination crops, the following must be noted:

- adopting a limited generation plan for multiplication by renewing breeder seed frequently.
- assuring adequate isolation from other fields or crops.

In growing a crop for seed, use the cultural method adopted by the progressive farmers in the locality but with adaptation and precaution that seed production necessitate.

Vigilance is required during growing season but particularly at critical stages of the development e.g emergence, flowering etc.

Mechanization is common on a large farm but not essential.

At any periods, faults should be looked for, diagnosed, and remedial action taken if possible and if not, noted for next year action.

It is important that any chemical application for weed or pest control be made at correct stage of crop development.

The following points should be noted:

1. previous cropping: This may bring about volunteer plots of different cultivar/spp. Give sufficient interval before planting on a land to allow all unwanted seed to germinate another. Use crop rotation to control weeds. Note that some seed borne diseases can persist in the soil e.g head smut (fungi) of maize and nematodes etc. Keep them in check by a long interval between susceptible crops.

2. fertilizers: fertilizer application should follow normal local practices for food crop but with some modification for seed production and appreciating the fact that the value of the crop justifies additional cost. P & K are more important for seed crops than for food crop especially for pulses can be applied at sowing time to take care of crop needs. Please avoid very heavy application of N to cereal crop as this is liable to encourage foliar diseases, causes excessive vegetative growth, lodging etc.

3.Irrigation: Water may be applied overhead through sprinklers or on the surface through soil channels. Note that overhead irrigation may encourage foliar or seed borne disease and can be inimical to pollination. As a general rule, surface irrigation is to be preferred. Water should be given to match the following stages of crop developments.

Crop development stages

Water supply

- | | |
|---|---|
| 1. Establishment vegetative growth
to initiation of flowering. | Ample water |
| 2. Flowering | Limited water (slight water deficiency
promote poor seed setting). |
| 3. Seed development | Ample water (to allow for greatest
number of seeds). |
| 4. Ripening | No water. |

4. Weeds: objectionable in all crops. Reason

- they compete for soil water, nutrients, light etc.
- smolder the crop in delay harvesting and ripening

- impedes cultivation – they are poisonous – they are parasites witch weed, broom rape – harbour pests and diseases.

In seed crop, they are containment if harvested with the crop seeds. There are standard methods of weed control e.g rotation of crops, drainage, flooding, apply fertilizer to promote complete crop growth, herbicides, destroy weed plants etc

5. Diseases and pests: To a certain extent, the incidence of diseases and pests in a crop is influenced by climate as well as by their presence in the soil. One has to take this into consideration in selecting farms for seed multiplication. To control the diseases and pests, use the same basic control measures as for food and forage crops e.g burial of plot debris by ploughing, rotation of crops, seed treat and insecticidal sprays, isolation of farms from area of with incidence of air borne and insect borne diseases, (1km distance), good sanitation in seed stores, roguing, special prevention against rodents and birds.

6. Seed: seeds for sowing be treated with fungicides/insecticides in case of pulses and legumes, it may be necessary to inoculate seed with correct strain of rhizobium bacteria.

7. Sowing date: sow your crops when (climatic factors) temp and water are favourable and are likely to remain so until harvest time.

-Prepare land in good time to obtain suitable tilth. Fine tilth for small seeded and not needed for large seeds eg cowpea, maize etc

- dept of sowing depends on seed size

- sow some seeds directly on the field or in a nursery and their transplanting.

8. Seed rate: The quality of seed sown per ha determines the density of the plant population within the crop. Thick sowing gives rise to adverse mass of thin weak stems with few flowers stems and poor seed setting. The humid conditions within the crop discourage pollinating insects,

promote fungi growth, delay ripening and so create harvesting problems. Use the right plant population. Experiments have shown that with increase in plant population, the yield of seed/ ha increase up to a point and beyond it no significant addition to yield is obtained.

9. Mechanical contamination: prevention of this is as important as that of genetic contamination by foreign pollen. Equally important is the prevention of mechanical contamination i.e admixture of foreign seed – hence separate seed crop from another similar crop by 2 or 3 m or by a physical barrier – clean all implement /containers e.g tractor, seed drills, drivers, combine harvesters, threshers, wagon, lorries- After harvest, seed must be kept separate in stores. Good practice is to grow only one crop of any species on the same farm.

10. Roguing : Is the process of removing undesirable plants in our seed crop field. Undesirable plants in our seed crop whose harvested seeds contaminate the product must be removed early during growth. Such plants may be weed, plants of other crop species, plants of another crop of same species or simply off types or genetic variants, arising from within the crop. Roguing is the process of remaining these undesirable plants from the crop. The efficacy depends on the distinctness of the rogues and on the skill of the roguers.

Roguing is a practice which is limited in its effectiveness but it does contribute to maintenance of purity and is an essential operation in seed multiplication.

It should be done several times at different stages of crop develop especially flowering when cultural characteristics are most fully expressed and differences are most obvious.

Watch out in maize, rouging must be before pollen is shed. You must pay particular attention to parts of the field where rogues are most likely to be found e.g gateway sites of old stacks and places where animals may have been fed; (Roguers walks slowly not more than 3km/hr) uproot, each rogue and put in a bag strapped round the neck and burnt later.

