

Single Cross Hybrid Maize Seed production

- i. Season:** There should be cloud free clear climate when we go for seed production.
- ii. Site selection:** It should be on main road which helps in frequent monitoring during flowering, which in turn affects the genetic purity and hybrid stability due to pollen contamination.
- iii. Soil type:** the soil should be well drained and fertile having sandy loam to clay texture. Avoid seed production in poor, saline soil and brackish water.
- iv. Isolation Distance:** Seed production should be taken in fertile well drained, weed and disease free soil and preferably the fields where preceding crop was not maize to minimize rouging and maintain the genetic purity. At least 400-500 metre distance is required to avoid any contamination.
- v. Male: female ratio:** The male: female ratio depends on (a) pollen shedding potential and duration of male parent; (b) male: female synchrony : for better seed setting flowering of female should be earlier than male or male pollen dehiscence should coincide with female silking and (c) season. In general the male: female ratio should be 1:2 or 1:3 or 1:4. Even farmers can go for 1:5 to 1:6 ratios if they go for paired male rows so that pollen load can be maintained for proper pollination and seed setting.
- vi. Time of Sowing:** To avoid flowering from heavy rains during *kharif* and low/high temperature during winter season the optimum time of sowing is first week of July during *kharif* and first week of November during winter. These adverse conditions affect seed setting due to pollen wash by rain or the extreme low temperature affects anther mortality whereas, high temperature affects the pollen viability due to blasting of pollen grains which in turn reduces the hybrid seed yield. Again harvesting also should not be coincides with rainy period as it affects drying, shelling and viability.
- vii. Seed Rate:** The seed rate depends on size of seed/ test weight, plant type and male: female ratio. 15 kg ha⁻¹ for female and 10 kg ha⁻¹ for male is recommended.
- viii. Seed treatment:** All the seed treatment practices should be done properly as described in earlier under point 5 in this bulletin as each plant contribute for yield.
- ix. Method of sowing and layout:** It is desirable to plant the crop on ridges. Depending upon the plant type the row and plant spacing should be kept at 60-75 cm and 20 cm, respectively. Identification labels/ tags should be put on the male and female lines to distinguish between them.
- x. Nicking of parental lines:** Female should flower earlier than male for proper fertilization. Tassel of male should have longer pollen shedding duration. Silk in female should come out from husk completely i.e. complete silk exertion which helps in complete seed setting i.e. up to tip. Complete and strong husk covering is desirable to avoid moisture penetration, bird damage, discoloration and mould development. Wherever, there is problem of nicking farmers can even go for paired rows of male and paired rows is also suggested if female parent is tall and male parent is dwarf.
- xi. Thinning:** Thinning must be done at 10-15 DAS for providing the each plant equal space for proper growth, which avoids confusion while rouging. Improper spacing will lead to unnecessary rouging of right plants which in turn increase in the cost of seed and labour and also reduces the yield due to improper plant population.
- xii. Weed management:** Timely weed management is very much required for achieving the optimum yield and to overcome competition between crop and weeds for space, moisture and

nutrients. It should be done as recommended in this bulletin under point 9 to achieve higher seed yield.

xiii. Nutrient management: Proper growth of plants is very important therefore proper fertilization is very much required to reduce the heterogeneity in soil fertility gradient. The applications of FYM increases the height, enhances the germination percentage, helps in substitution and uptake of micronutrients by holding more nutrients in the root zone. It also enhances the root development, retention of moisture for long time, helps in faster growth, and also improves soil health and fertility. Fertilizer application should be done properly as described in point 7 of this bulletin for higher seed yield and profitability in seed production.

xiv. Water management: After first thinning (15-20 DAS), flowering and grain filling are the most critical stages of the crop for irrigation. Mild irrigation and mild fertilization rule in hybrid seed production to achieve higher seed yield.

xv. Detasseling

- Detasseling in female should be done before anthesis.
- It should be practiced row-wise.
- One person should follow to monitor the each row to check that no part of the tassel is left inside.
- The process of detasseling should continue for 8-10 days.
- While detasseling, leaf should not be removed which will reduce the yield. It has been observed that the removal of 1 to 3 leaves along with tassel reduces 5-15 % yield.
- The removed tassel should not be thrown in the field but fed to the cattle as it is nutritive fodder.

xvi. Stages of crop inspection

- At the time of sowing: to monitor the land, isolation distance, planting ratio of male: female, proper sowing time, seed treatment
- During pre-flowering/vegetative stage: to verify the rouging and removal of off type plants
- During flowering stage: to check disease and pest infestation
- During post-flowering and pre-harvest stage: to remove the late and diseased plants
- Differential type of tassel/silk plants
- Harvesting time: to see the proper time of harvesting

xvii. Removal of off-type plants

- i) After 12-15 days after sowing off-type and excess plants should be removed.
- ii) At knee high stage all the dissimilar plants should be removed.
- iii) At flowering remove dissimilar tassel bearing plant before anthesis from the male.

xviii. Disease and pest management: The area of hot spots for pests and diseases can be avoided for hybrid seed production, because inbred lines are more sensitive to incidence of pests and diseases. Bacterial stalk rot is a problem in water logging areas so avoid such site for seed production. Resistant inbred lines can be used to overcome the losses due to pests and diseases. There are other measures like cultural and chemical methods which are given in point 10 of this bulletin.

xix. Management of abiotic stresses: To maintain the humidity during pollination irrigation is required to prolong the viability of the pollen grains.

xx. Harvesting: If possible male parent should be harvested after pollination. Optimum moisture content in grain at harvesting should be around 20 %. The harvested cobs should spread evenly instead of making heap.

xxi. Drying and sorting of seed parent cobs

The drying of the cobs should not be done either on the kuccha or pucca flour, rather it should be dried on tarpoline sheets to avoid seed injury and during night the cobs should be kept covered. To maintain the purity, dissimilar, diseased and pest infested cobs should be removed before shelling. The female cobs should be dried up to 13-14 % moisture content before shelling.

xxii. Shelling

Shelling of female parent should be done earlier than male to avoid mechanical mixture. Shelling can be done manually or by power operated maize Sheller.

xxiii. Seed processing:

All under size, broken, damaged etc seeds should be removed for maintaining the quality of seed.

xxiv. Storage and marketing

Seed drying should be done till the moisture content of the seed is reduced to 8 % and it should be kept in aerated jute bags. Seed should be stored at cool and dry place preferably in cold storage. Poor storage conditions will lead to loss of vigour and poor germination. Marketing should be done with specifications and standards.

Selection of right seed production site alongwith practicing proper seed production technology and maintaining high genetic purity are the key to increase the hybrid seed yield in maize.