

Understanding hybridization

Hybridization is the process of crossing two genetically distinct plants. This process is essential to produce progenies with improved qualitative and quantitative traits such as yield and disease resistance.

The seeds as well as progeny resulting from this process is termed as hybrid or *F1*.

Essentially the main objective of hybridization is to introduce genetic variability. Hybridization is done between parents within the same species or from different species or genera.

A breeder must have a well defined objectives based on needs of the farming community. The success of a hybridization program depends on how efficiently a breeder manages subsequent generations and its screening.

TOOLS YOU NEED:

1. Forceps
2. 70% Ethanol
3. Petri dish or microtubes for pollen collection
4. Tags for labelling
5. Bags for flower bagging



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HYBRIDIZATION IN TOMATO AND CHILLI

GUIDE TO GETTING
STARTED



AFACI
Asian Food & Agriculture
Cooperation Initiative

Steps for Hybridization

1 Choice of parents

Atleast one of the parents should be a well adapted and proven variety while the other parent(s) should have sought after characters

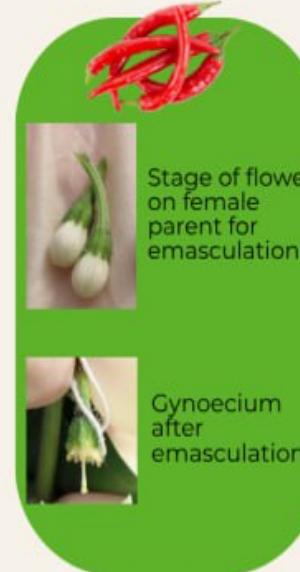
2 Evaluation of Parents

Incase performance of the parental line is not known in the target area, evaluation is necessary for characters it is expected to contribute such as disease resistance. It is important to check for heterozygosity if the crop species shows 5% crosspollination.

3 Emasculation

Removal of the stamens and anther without affecting the female reproductive organ of a flower is called emasculation. This is done to prevent self fertilization in the female parent. Emasculation should be done before the stigma becomes receptive and the anthers become mature to prevent accidental self-pollination. Generally, emasculation is done in the evening between 4-6pm

 Corolla and the anthers are completely removed in tomato and chilli flowers with the help of forceps. It is important to not select flowers that are open.



4 Bagging

Bagging should be done immediately after emasculation and after pollination to prevent random pollination from occurring. Bags can be made of butter paper or fine cloth.

To prevent fungal development inside the bags, it should be removed 2-3 days after pollination when the danger of cross-pollination is over.

5 Tagging

The pollinated flowers should be appropriately tagged with information of date of emasculation, pollination, and name of female parent followed by male parent.

For example:

Female Parent(A) X Male parent (B)

6 Pollination

Mature, viable and fertile pollen should be placed on a receptive stigma. As far as possible fresh pollen should be used harvested from fully open flowers but not from old flowers.

Pollination should be done in the morning hours with the help of brush or by dipping the stigma into pollen.

15-20 crossed flowers can be maintained on one plant.



7 Harvesting and Storing of F1 seeds

Crossed fruits should be harvested when mature. Extracted seeds should be properly stored with the original tags. The seeds advance to the next stage of screening for desired characters after selfing.

 It is important to ensure proper isolation distance or protected structures especially crossing chilli.