

## Emasculation and pollination techniques in Brinjal (*Solanum melongena* L.) for quality seed production

Dhruv P. Joshi<sup>1\*</sup>, Ritesh S. Solanki<sup>1</sup>, Chirag D. Prajapati<sup>1</sup> and  
Pankajkumar C. Joshi<sup>2</sup>

<sup>1</sup>Department of Genetics and Plant Breeding, C. P. College of Agriculture,  
Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat

<sup>2</sup>Department of Horticulture, C. P. College of Agriculture, Sardarkrushinagar Dantiwada  
Agricultural University, Sardarkrushinagar, Gujarat

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### Introduction

Among the various vegetable crops, brinjal is a very valuable crop in India. Besides normal crop cultivation, seed production gives more income due to the valuable hybrid or variety seeds. To produce hybrid seeds, special techniques are required for emasculation and pollination. This article will provide information regarding crossing techniques in brinjal and also tell the readers about care to be taken during these processes.

Nature of the pollination of brinjal is self-pollination, but it can be cross-pollinated (6–10%) (George, 1985). The eggplant flowers are hermaphrodite. Four types of flowers are observed, namely: long-styled with a big ovary, medium-styled with a medium-sized ovary, pseudo short-styled with a rudimentary ovary and true-short styled with a very rudimentary ovary (Krishnamurthi and Subramaniam, 1954). According to Kowalska (2008), long-styled flowers make up 60% of a brinjal plant, followed by medium and short-styled flowers (10–15% and 22–30%, respectively). Fruit setting is higher on the flowers at the central portion of the plant with a long style (49–100%) followed by a medium style (46–85%). Figure 1 showing selection of proper bud for emasculation.



**Figure 1: Type of bud suitable for emasculation**

### **Period for crossing**

Flowering occurs 40-45 days after transplanting. Opening of flowers occurs at 7:00 to 8:00 a.m., followed by dehiscence of anthers after 15-20 minutes. The stigma is highly receptive at the flower opening stage. The receptivity of the stigma can be observed from its plump and shiny appearance, effective from a day prior to flower opening until about four days after opening. Under field conditions, pollen viability ranges from a day (summer) to 2-3 days (winter). Generally, emasculation can be done from 3 pm to 6 pm and pollination from 7 am to 12 pm.

### **Emasculation**

Flower buds that pretend to be open the next day are selected. Using sharp-pointed forceps, remove the petals and cut the sepals in half for easy emasculation. Then, open the bud and remove all the anthers carefully without damaging the pistil. Emasculated buds are covered with a white butter/kite paper bag (choose a white colour for emasculated buds and a red colour for pollinated buds to avoid confusion).

### **Pollen Collection**

Select the freshly opened flowers of the male parent at 7 am before the anther dehiscence. One can bag the buds of the male parent on the previous day's evening (Rahman *et al.*, 2015). Put the collected flowers in the container and allow them to dehisce in the sunshine for half an hour. Then, using the needle, vibrate the anthers by keeping it upside down. Plenty of pollen grains are collected in the container.

### Pollination

The emasculated buds are now uncovered and the stigma is receptive to pollen. The stickiness is also observed on the stigma. By using the hair brush or with the finger, collect the pollen from the container and apply it to the stigma. Then tag the flower without damaging it and bag it with red butter/kite paper. To ensure better pollination, one can repeat pollination on the same flower bud the next day. Figure 2 showing properly bagged and tagged bud after pollination.



**Figure 2: Properly bagged and tagged bud after pollination**

### Fruit setting

After 7 to 10 days, one can observe the enlarged ovary, which is the sign of fruit setting. After around 5 to 6 weeks, the fruits get mature and turn a completely yellow colour, which is a sign of mature seeds inside the fruit. These fruits are collected and seeds are collected from them. Around 300 to 400 seeds are observed in the average-sized fruit.

### Precautions to be taken when using crossing techniques

- ✓ Bagging is a must to protect the flower and fruit from the shoot and fruit borer (*Leucinodes orbonalis*). Also use kite paper or butter paper bag that is light in weight to avoid excess weight on the flower petiole.
- ✓ Remove infected twigs with a shoot and fruit borer to avoid the entry of larvae into the fruits.
- ✓ Avoid dense planting to reduce disease and pest infestation.

- ✓ Apply proper insecticides at frequent intervals to reduce pest infestation, which ultimately gives healthy fruits.
- ✓ Hand pollination on flowers with long styles and presence at the central axis has a higher chance of producing fruit than medium, short and pseudo-styled flowers.

### References

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