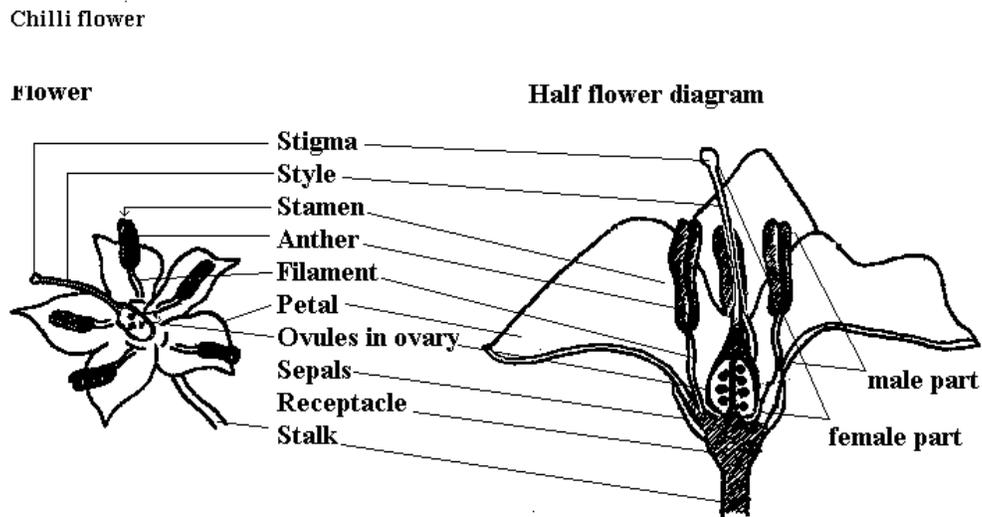


CHILLI (*Capsicum frutescense*)

Chillies widely used as vegetable and spice is an often cross pollinated crop, where the extend of cross pollination is upto 7 to 36 per cent. It belongs to the family solanaceae. It is also known as hot pepper and botanically it is known as *capsicum annuum*. The quality seed production techniques of chillies comprises of the following steps.

Botany: Often Cross pollinated vegetable. The flower is protogynous. Anther dehisces only half to 5 ½ hr after stigma becomes receptive. Anthesis in chilli occurs between 6.00 and 9.00 hr. Flower remains open for 2 to 3 days, receptivity of stigma was the highest at the day of flower anthesis.



Method of seed production : Seed to seed

Stages of seed production : Breeder seed → Foundation seed → Certified seed.

Varieties: K.1, K.2, K.3, Co.1, Co.2, PKM.1, MDU.1, Bagyalakshmi.

Hybrids: KT.1, (Pusa Deepti), Solar Hybrid 1, Solar Hybrid 2. Early Bounty, Indira, Lario, Hira, Bharat.

Season : June-July, February-March, September- October.

Land requirement : There are no land requirement as of previous crops, but the land should be free from volunteer plants. Generally areas affected by wilt or root rot may be avoided. Crop rotation must be followed to avoid endemic Solanaceous pests.

Isolation requirement : Minimum isolation distance of 400 M for foundation and hybrid seed and 200 M for certified seed production are necessary.

Seed rate : Seed required for one hectare is 500 g to 1 kg for variety; for hybrids - Female = 200 g and male = 50 g

Nursery : Sow the seeds in raised nursery bed of 20 cm height, in rows of 5 cm gap and covered with sand. Eight and ten nursery beds will be sufficient to transplant one acre. Apply 2 kg of DAP 10 days before pulling out of seedling.

Transplanting: The seedlings of 30-35 days old are ready for transplanting. Transplanting may be done on the ridges in the evening.

Foliar spray: To arrest the flower drop, NAA (Planofix) can be sprayed @ 4ml/L. Very light irrigation is also done arrest the flower drop.

Manuring : Apply 50 tones of FYM/ha for irrigated crop. Basal 0:70:70 kg of NPK and 50 kg of N at 15 days after transplanting and 50 kg N at 45th days after transplanting.

Roguing: Field inspection and roughing should be done both for varieties and hybrid at different stages based on the plant height and its stature, flower colour and pod characters. The plants affected with leaf blight, anthracnose and viral diseases should be removed from the seed field.

Pest and disease management: The important pest attacking chilli and capsicum are thrips, aphids, pod or fruit borer and mites. The thrips and aphids can be controlled by spraying Dimecron (systemic pesticide), pod borer can be controlled by spraying Nuvacron and the mites can be controlled by spraying Kelthane. The major diseases affecting the plants are die back or fruit rot, powdery mildew and bacterial leaf spot. Spray Dithane M-45 for control of die back, Karathane for powdery mildew and Agromycin for leaf spot disease control.

Hybrid seed production: The crossing operation can be performed as per the methods outlined for tomato and brinjal hybrid seed production. However, hand emasculating and pollination is somewhat difficult since the flowers are minute. Hence use of male sterile lines can also be employed for hybrid seed production.

Harvesting and processing: Harvesting should be done in different pickings. First and last one or two pickings can be harvested for vegetable purpose. The well ripened fruits with deep, red colour alone should be collected in each picking. After harvest, fruit rot infected fruits are to be discarded. The harvested pods are to be dried



under shade for one (or) two days and then under sun for another 2 or 3 days. Before drying pods are to be selected for true to type and graded for seed extraction. The seeds are extracted from graded dried pods. The pods are taken in gunny bag and beaten with pliable bamboo sticks. The seeds are cleaned by winnowing and dried to 10% moisture content over tarpaulin. Then seeds are processed with BSS 8 wiremesh screens. For large scale seed extraction, the TNAU model chilli seed extractor may be used.

Seed Yield : 50-80 Kg/ha

Seed Certification

Number of Inspections

A minimum of three inspections shall be made as follows:

1. The first inspection shall be made before flowering on order to verify isolation, volunteer plants, and other relevant factors,
2. The second inspection shall be made during flowering to check isolation, offtypes and other relevant factors
3. The third inspection shall be made at maturity and prior to harvesting to verify true nature of plant and other relevant factors

Specific standards:

Factors	Foundation	Certified
Off types	0.1%	0.2%
Designated diseased plant	0.1%	0.5%

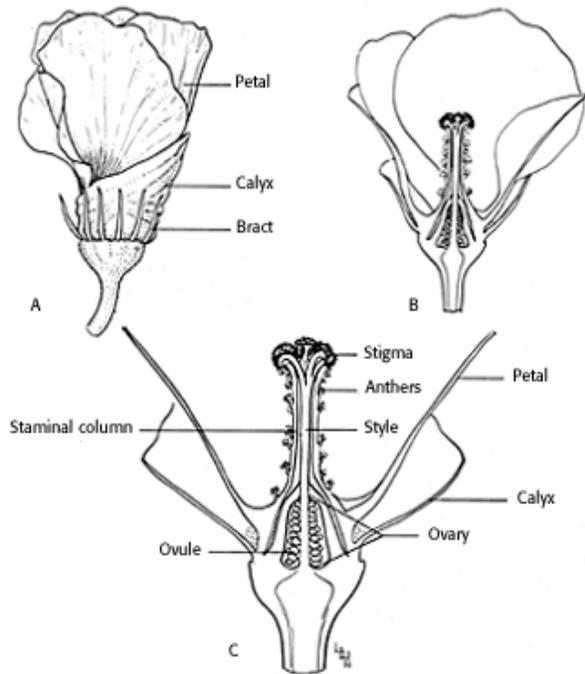
The designated diseases are caused by *Collertotictum capsici* and leaf blight caused by *Alternaria solari*.

Seed standards (Variety & Hybrid)

Factors	Foundation	Certified
Pure seed	98%	98%
Inert matter	2%	2%
Other crop seeds	5/kg	10/kg
Weed seeds	5/kg	10/kg
Germination	60%	60%
Moisture content	8%	8%
For VP Container	6%	6%

BHENDI (*Abelmoschus esculentus*)

Botany: Anthesis is between 9 and 10 hr and is preceded by maximum anther dehiscence between 8 and 9 hr. The stigma remains receptive on the day of anthesis. Bhendi is an often cross pollinated crop. Cross pollination to an extent of 12 per cent is due to [protogynous](#).



Method of seed production : Seed to seed

Stages of seed production : Breeder seed → Foundation seed → Certified seed.

Varieties : Co.1, MDU.1, Parbhani Kranti, Arka Anamika, Pusa A-4, Pusa Sawani

Hybrids:CO2,CO 3, Mahyco hybrid, Shoba

Season : June-July, September- October and February- March

Land requirement : Select field on which bhendi crop was not grown in the previous season, unless the crop was of the same variety and certified. Field should be free from wild bhendi (*Abelmoschus sp.*)

Isolation requirement: Seed field must be isolated from other varieties at least by 400 M for foundation and hybrid seed production and 200 M for certified seed production.

Seed rate : Varieties : 8-10 kg/ha

Hybrids : 4 kg/ha (Female); 1 kg/ha (Male)

Manuring: Apply 12.5 tons of FYM/ha before ploughing. Apply 150:75:75 kg NPK/ha, of which 50% of the N should be applied as top dressing in two split doses at flowering and 10 days later.

Planting ratio: For hybrid seed production, female and male parents are normally planted in the ratio of 4:1.

Roguing: Minimum of three inspections for varieties and 4 inspections for hybrids, one at vegetative, two at flowering and one at fruit maturity stages. The roguing should be based on the plant characters, hairiness, fruit character like fruit colour, number of ridges, fruit length etc., and the off type and mosaic attacked plants should be removed from the seed field. Wild bhendi if present should be removed before flowering.

Pest and disease management: The major pest attacking bhendi are jassids, aphids and white fly, which can be controlled by spraying Rogar or Dimecron or Endosulphon. The pod borer and red spider mites can be controlled by spraying Endosulphon and Kelthane, respectively. The diseases such as yellow vein mosaic and powdery mildew can be controlled by spraying systemic insecticides and Karathane, respectively.

Hybrid seed production: In bhendi, since the flowers are large in size, hand emasculation and pollination is the best suitable method for seed production. The emasculation and dusting can be done as per the methods outlined in tomato. The male and female parents are raised in blocks at the ratio of 9:1 (Female: Male).

Harvesting: Fruits should be harvested when they have dried (30-35 days after crossing). The pods which expose hairline crack and turn to brown colour on drying alone are cut using sickle manually.



Threshing:

The pods are dried and threshed using pliable sticks. Separated seeds are winnowed to remove plant debris and dried over a tarpaulin to 10% moisture content. Dried seeds are subject to water floatation in which, good seeds sink while poor seeds float. The floaters are removed, while sinkers are dried under shade followed by sun drying. Then the seed are cleaned, dried and treated with Captan/Thiram.



Processing: Seeds are to be processed with BSS 7 wiremesh sieve.

Seed Yield: 1000-1200 Kg/ha

Specific standards:

Factors	Foundation	Certified
Off types	0.1%	0.2%
Objectionable weed	None	None
Disease affected plants	0.1%	0.5%

Objectionable weed: wild *Abelmoschus sp.*

A. moschatus



A. manihot



Designated diseases: Yellow Vein Clearing Mosaic (Hybiscus virus-1)



Seed standards

Factors	Foundation	Certified
Pure seed	99%	99%
Inert matter	1%	1%
Other crop seed	None	5/kg
Total weed seed	None	None
Objectionable weed	None	None
Other Distinguishable Varieties (ODV)	10/kg	20/kg
Germination	65%	65%
Moisture	10%	10%
For VP Container	8%	8%

Questions

1. Chilli is an often Cross pollinated vegetable. (**True**/False)
2. The flower of chilli is
 - a. Protandry
 - b. Terminal
 - c. Axillary
 - d. Protogyny**
3. _____ arrests flower drop in chilli.
 - a. NAA**
 - b. GA3
 - c. MH
 - d. Ethrel
4. Off type allowed during certified seed production in chilli is _____
 - a. 0.5%
 - b. 0.02%
 - c. 0.2%**
 - d. 2%
5. Isolation requirement for foundation and certified seed production in chilli is _____
 - a. 400 & 200 M**
 - b. 100 & 200 M
 - c. 600 & 200 M
 - d. 600 & 400 M
6. Bhendi is an often cross pollinated crop. (**True**/False)

