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Coloured Capsicum Cultivation under Naturally Ventilated Polyhouse



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Coloured capsicum (sweet pepper or bell pepper) is one of the important high value vegetable crops cultivated in green houses and to the some extent under shade net house in milder climatic regions like Bangalore, Pune etc. It is rich in vitamin-A, C and minerals. Capsicum cultivation is very popular in Peri-Urban production systems because of easy access to urban markets like Bangalore, Hyderabad, Pune *etc.* It is also gaining importance in Goa state due to ready market available throughout the year. It is sold anything between Rs.80-150/kg depending upon the colour, quality and season *etc.* Capsicum yields in open field cultivation ranges between 20-40t/ha, where as in a green house the yield range is from 100-120t/ha. In addition to the quantum jump in yield, the superior quality and substantial reduction in the use of pesticides, makes it an economic and eco friendly produce to grow capsicum in naturally ventilated green houses round the year.

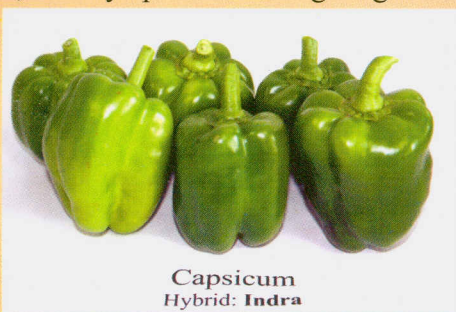
Climatic requirements

Capsicum is basically a cool season crop and day temperatures less than 30°C is favourable for growth and yield. But due to introduction of good number of hybrids with wider adaptability, it can be successfully cultivated in warm climatic place like Goa state. But very high temperature results in rapid plant growth and affects fruit set. Lower night temperature favours flowering and fruit set. Hence, planting during September-October in Goa will coincide with milder climate during flowering and fruiting *i.e.* November-February. Shading is required during summer to avoid temperature build up in greenhouses.

Varieties / Hybrids

Indra

Plant: Medium tall, bushy plants having vigorous growth. Dark green leaves, dense foliage providing fruit shelter.



Capsicum
Hybrid: Indra

Fruit: Fruit is dark green, thick-walled and glossy with average weight 170 gm, length 10-12 cm, girth 10 cm having 3 - 4 lobes. Fruit setting starts in 50-55 days after transplanting. Longer shelf life. Ideal for long distance transportation. High export potential.

Bomby

Plant: Strong, sturdy, tall plant which requires staking. Early hybrid with good branching. Dense foliage provides adequate fruit shelter.

Fruit: Fruit is dark green, thick walled, glossy with average weight 130-150 gm. length 10-11 cm, diameter 10 cm having 3-4 lobes. Longer shelf life. Ideal for long distance transportation.



Orobelle



Capsicum
Hybrid- Orobelle

Plant: Orobelle is a blocky F1 hybrid turning from green to yellow at maturity. It sets well under cold conditions.

Fruit: Fruits are blocky; almost square (10 x 9 cm) with a medium-thick wall.

Average fruit weight is 150. With its many resistances it is a good choice for growing in the open field, in greenhouses or under plastic under all circumstances.

Swarna

Plant: Strong and vigorous plants

Fruit: Blocky to long fruit with thick and firm wall, attractive dark green colour, quickly turning to the bright yellow. Fruit weight:



Capsicum
Hybrid- Swarna

200-250gms. Suitable for green house, tunnel and open field cultivation

Nursery and seedling raising

Seedlings are raised in pro-trays placed inside a net house or polyhouse to prevent from insect infestation. Vermicompost and sand @ 1:1 or well decomposed, nutrient enriched and sterilized cocopeat is used as the growing medium for nursery production. The pro-trays are initially filled with growing medium and shallow depressions of about 0.5cm depth are made in each cell for seeds sowing. Each cell is sown with one seed and germination starts in 5-7 days of sowing. Seedlings may be sprayed with Acephate (0.75 ml/litre of water) to

avoid any thrips infection. The seedlings will be ready for planting in 30-35 days after sowing. About 40g seed is required to plant 1000m² of green house area.



Sowing of capsicum seeds



Seedlings ready for transplanting

Growing beds and soil sterilization

The soil inside the polyhouse is loosened to fine tilth and then beds are formed at 75cm width with 45cm height and leaving 45cm working space between two beds. Before bed formation, well decomposed organic manure or Vermicompost along with sand, saw dust is added to soil @ 10kg per m². The beds are drenched with 4% formaldehyde (4litres/m² of the bed) and covered with polythene sheet for 3-5 days. Afterwards, the polythene is removed; the beds are raked repeatedly every day to remove the trapped formaldehyde fumes completely prior to planting.



Soil beds for planting



Covering of soil with plastic sheet after sterilization with formalin

Planting , pruning and training

The ready seedlings are planted at spacing of 60cm between rows as paired row system by keeping 30 cm between plants on raised beds. Before planting, the seedlings are sprayed with Imidacloprid (0.3ml/l) to prevent any sucking pest infestation in the polyhouse. Watering the bed is done daily with a rose can till the seedlings get established well. Afterwards drip irrigation is started daily to supply 2-3 litres of water per square meter per day depending on the local weather condition. Capsicum plants are trained to retain 2-4 stems per plant. Pruning is done at weekly interval starting from 15-20 days after transplanting. At every node the tip splits in to two giving rise to one strong branch and one weak

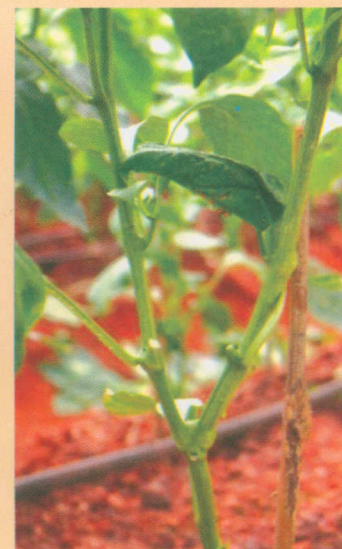
branch which is removed retaining the strong branch. This operation needs to be done once in a week. From 4th month onwards the pruning operation will be done once in 10 days.

Fertigation

The total dose of 150 kg each of N: P₂O₅:K₂O per hectare using water soluble fertilizers is given through fertigation for entire crop growth period of 6-8 months. Water soluble fertilizer supplying 19% each NPK is used at the rate of 2.5-4g/m² for every fertigation by giving twice a week starting from third week after planting.



Two row planting at 45x30cm spacing on soil beds



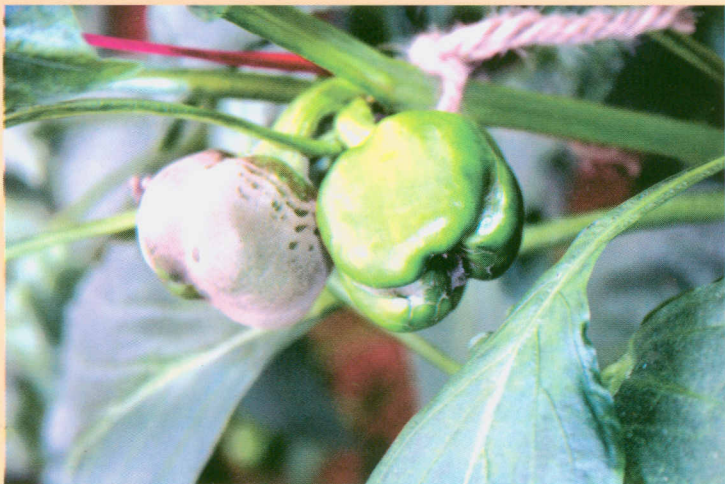
Pruning of capsicum to retain two primary branches

Disease and pest control

Thrips and mites: It is a sucking pest affects most of the green house crops. Minute insects with fringed wings, serious during dry periods (high temperature).



Thrips and mites infestation on leaves



Thrips and mites infestation on Fruits

Affected leaves show upward (thrips) and downward (mites) curling and it also market value and quality of fruits due to scrapping on the fruit surface. To control thrips, spraying of Acephate (1g/l) or Imidacloprid (0.3ml/l) or Fipronil (1ml/l) is given.

Bacterial wilt:

It is caused by soil bacterium which is naturally present in the acidic soils of coastal area. Sudden wilting of plant is observed due to blockage in the xylem vessels. Drenching with Streptocycline (1.5g/l) is generally practised.



Sudden wilting of capsicum plants due to bacterial blight infestation

Harvesting and yield

Harvesting of capsicum fruits starts from 60 days of planting in case of green colour capsicum, 80-90 days in case of yellow and red fruited hybrids. Harvesting continues up to 170-180 days at 10 days interval in green and up to 200-250 days in red and yellow. Fruits that

are mature green, yellow when it is 75% yellow and red when it is 100% red are harvested and kept in cool place. A yield of 80-100t/ha (8-10kg/m²) can be expected from a single crop. Average individual fruit varies from 150-200g.



Correct stage of harvesting in yellow capsicum



Harvesting of coloured capsicum in polyhouse



Assorted fruits of coloured capsicum after harvest

Post Harvest Handling and Storage

Fruits are graded to size and colour to ensure a uniform attractive pack. Shrink wrapping each fruit and storing at 7-8°C will enhance storability up to 45-60 days.



Shrink wrapping of capsicum fruits for extended shelflife.

Note:

- Avoid spraying same group of insecticides at each spray; it should be rotated with other group (different mode of action) of insecticides or botanicals to prevent pests from developing resistance.
- Add 0.5ml/L of any sticking agent (teepol or sandovit) to the spray solution to either oil or insecticide solution for easy dilution.

Caution:

- Oils may cause phytotoxicity at 1% when the temperature is more than 30°C in greenhouse. Hence it should be done with caution and sprayed in the evening
- After spraying of insecticides leave a waiting period of 7-10 days before harvest of fruits

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