

## Protected cultivation in vegetables

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Protected cultivation techniques provide distinct benefits of productivity and quality along with this protected cultivation provide high market price of vegetables in off-season as the vegetables produced during their usual season normally do not fetch good income due to huge availability of these vegetable in the markets. So, there is great importance of protected cultivation techniques to enhance the economic level of farmers and traders and it can be elaborate as protected cultivation practices are cropping techniques wherein the micro climate nearby the plant body is organized partially or fully as per the necessity of the vegetable species grown throughout their period of growth.

Why protected cultivation...??

Higher yield than open cultivation
Control of microclimatic conditions
Better quality of produce
Protection from biotic and abiotic factors
Proper utilization of climatic factors like light, temp. etc
High earnings by raising off season vegetables
Year round production of vegetables
Nursery raising and hardening

**Prospectus of protected cultivation in vegetable production:** India has varied agro climatic conditions so there are number of opportunities for protected vegetable

production. In low temperate areas growers can raise early crops using protected structures to increase their income. Its highly economical for farmers to grow vegetable nursery in protected structures because it provide several benefits such as off seasonality, ease in supervision, and safety from biotic and abiotic stresses. Cultivation of cucurbits in plastic low tunnel technology for off-season in northern plains of the country has great potential for the future. Walk-in tunnel and low tunnel can be used on a large scale for rising off-season nursery and vegetables during winter months. For virus and pesticide protection of tomato, chilli, sweet pepper and okra during rainy season or late rainy season, insect proof net houses can be used on a large scale production. Different protected technologies can be used for protected vegetable cultivation in peri-urban areas of the country. These technologies provide quality produce; hence fulfill the demands of consumers



for the pesticide free quality vegetables.

**Green house :** Greenhouse Technology is the technique, where the environmental conditions are so modified that one can grow any plant in any place at any time by providing suitable environmental conditions with minimum labor. It is used to protect the plants from the adverse climatic conditions such as wind, cold, excessive radiation, extreme temperature, insects and diseases.

**Poly-house and shade net house:** The poly-house is a subway with polyethylene sheets which stabilize the UV rays and helps in proper photosynthesis, on the other hand shade net is a structure made from agro nets or anti insect net to maintain

required environmental conditions. East to west is the proper direction for construction of these structures because it allow proper entry of sunlight. The yield under poly- house cultivation can be attained 4 to 8 times more as compared to the open field crop cultivation and out of this more than 90% of total yield obtained during off season which fetch higher market price.



**Vegetable crops under protected cultivation:** Off-season vegetable cultivation, off-season nurserycultivation and diseases, insect-free plants of solanaceae, cucurbits, cole crops and leafy vegetables can be obtained from protected cultivation technology. Indeterminate type tomato varieties grown under greenhouse conditions as they continue to grow and set fruits nearly for a yearlong plant lifetime. The production of hydroponic lettuce results in short production period *i.e.* 35-40 days, availability year round, and its enhance the quality of the produce. Capsicum varieties in different colors like red, yellow, green

**ow tunnels:** These are miniature structures producing greenhouse like effect that facilitates the trap of carbon dioxide. Growing vegetable in low tunnel has many benefits with regards to increase in yield, early harvesting, conserving soil heat, protecting plant from different biotic and abiotic factors which ultimately increasing the profit for the farmers.

**Mulching with Drip irrigation:** Covering the soil around the plant with plastic film or straw to preserve the soil moisture and regulate soil temperature as well as prevents weed growth. Black, silver-black, red, while-black etc. are different color plastic films used as mulches. Mulches hastens uptake of micro nutrients from the soil while its combination with drip irrigation, a high efficient technique which ultimately enhance the yield potential.

and black have great demand at five star hotels for variety of food preparations, preparing oleoresins and oils and extraction of natural colors. Cultivation of parthenocarpic cucumber in greenhouse can be a lucrative project for the vegetable growers and yearly three crops can be taken. Trellis system is required for cultivation of cucumber because it's a vine crop.

**Success story :**

Success stories of growing tomato, capsicum, chilli, long gourd and seedless cucumber in Nabha, Punjab, India and gave yields of about 4-5 lakh per acre from capsicums and 25 tonnes from one fourth of acre in Coimbatore as against similar yields from one acre.

Cost efficient protected structures, *viz.*, low cost greenhouses, walk-in tunnels, plastic low tunnels, are suitable for off-season vegetable cultivation and nursery raising further these technologies are not only generating opportunities at upper level but also to the growers with the minor landholdings as the higher productivity levels hold economic significance to agriculture.

**Table 1 : Fertigation scheduling in vegetables under protected cultivation**

Crop	Spacing (m)		Plot/ 1000m <sup>2</sup>	Dose* (ppm)			Total (kg/1000 m <sup>2</sup> )			Yield (q/ 1000m <sup>2</sup> )
	*P to P	*R to R		N	P	K	N	P	K	
Tomato	0.45	0.4	2773	100-250	50-80	100-250	35	12	39	150-200
C. tomato	0.45	0.4	2773	100-250	50-80	100-250	35	12	39	30-40
Capsicum	0.3	0.4	4160	100-220	50-100	100-220	32	15	36	40-50
Cucumber	0.3	0.4	4160	120-220	60-80	120-240	10-16	4-7	11-18	30-40

\*Dosages vary depending upon varieties/ season/ crop stage. \*Plant to Plant \*Row to Row

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