

Importance and scope of protected cultivation of vegetable crops



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What is protected cultivation?

Protected cultivation is a process of growing crops in a controlled environment. This means that the temperature, humidity, light and such other factors can be regulated as per requirement of the crop.

What is greenhouse ?

“A greenhouse is a covered structure which protects plants from wind, precipitation, excess solar radiation, temperature extremes and considerable for pests & diseases.”

Concept of greenhouse farming

- Green house farming is a total concept of modifying the natural environment for optimum plant growth.
- It incorporates the manipulation of air and root zone temperatures, relative humidity, radiant energy (light), air velocity, atmospheric concentration of carbon dioxide, root zone oxygen concentration and nutrient and moisture supply to control crop growth.

ATTRIBUTES OF GREEN HOUSE

- **It is framed or inflated structure**
- **It is covered by a transparent or translucent material to maintain optimum light levels.**
- **Crop micro – climate can be at least partially controlled.**
- **It is large enough to permit a person to work inside**

Scope and importance of protected cultivation in India

- **Agriculture is highly dependent on environment, and it's very difficult to get favourable climatic conditions for crop growth and development as per crop need.**
- **Agriculture is basically climate/season based, a hot and humid climatic conditions characterized in rainy and post rainy season is most favourable for both crop and crop enemies.**
- **To raise a healthy disease free crop, spring-summer seasons was counted as most suitable. But, fast climatic changes happening across the globe has changed climatic characteristics of a season, which has resulted in untimely rains and other fluctuations in the spring-summer season, raising the challenge to develop climate resilient technologies.**

- **Not even that, with time extreme, hot and cold temperature stresses have been noticed in geographically varied locations where it was not supposed to be earlier based on various geographical factors deciding the climatic conditions of that area.**
- **Therefore, there is need to develop suitable varieties and technologies to sustain these challenges which may come up in form of various biotic and abiotic factors.**
- **Vegetable cultivation is an awesome business in India, but under open field conditions by following traditional cultivation practices it is difficult to manage various abiotic and biotic stresses. These stresses not only reduce productivity levels but they are also responsible for poor quality specifically during rainy and post rainy season.**
- **Mostly to manage biotic stresses farmers spray large amount of different chemicals, this not only enhances the cost of cultivation but it also increases residual toxicity in the freshly produced vegetables, which is ultimately hazardous to human being.**

How to address these issues, can we manipulate the climatic conditions or can we provide protection to the crops against climatic fluctuations and various other related stresses???????



PROTECTED CULTIVATION

ADVANTAGES

- Crops can be raised successfully under adverse agro-climatic conditions.
- Protection of plants from abiotic stress (physical or by non-living organism) such as temperature, excess/deficit water, hot and cold waves.
- Crops can be grown throughout the year in a particular area.
- Off season nursery can be raised which advances the harvesting period.
- It provides an excellent opportunity to produce high quality yield.
- Productivity and financial return per unit area is higher.
- High quality seed production attributes can be undertaken.
- Greenhouses are ideally suited for farmers having small holdings.
- Insect pests and diseases can be controlled easily.
- Minimised agricultural inputs.
- Production of disease-free and genetically better transplants.
- Propagation of planting material to improve germination percentage; healthy, uniform, disease free planting material and better hardening.

Protected cultivation is a tricky technology highly dependent on intelligent implementation of protected structure for vegetable cultivation.

Must have a knowhow-

WHAT, WHEN, WHERE & WHY????

Limitations

- (i) High cost of initial infrastructure (capital cost).**
- (ii) Non-availability of skilled human power and their replacement locally.**
- (iii) Lack of technical knowledge of growing crops under protected structures.**
- (iv) All the operations are very intensive and require constant effort.**
- (v) Requires close supervision and monitoring.**
- (vi) A few pests and soil-borne pathogens are difficult to manage.**
- (vii) Repair and maintenance are major hurdles.**
- (viii) Requires assured marketing, since the investment of resources like time, effort and finances, is expected to be very high.**



Future

Scope

- **Vegetable farming in agri-entrepreneurial models targeting various niche markets of the big cities is inviting regular attention of the vegetable growers for diversification from traditional ways of vegetable cultivation to the modern methods.**
- **Under the new era of FDI (Foreign Direct Investment) in retail, these kinds of models possess high potential for enhancing the income of farmers opting for quality and offseason vegetable cultivation through protected cultivation.**

- **Production of vegetable crops under protected conditions provides high water and nutrient use efficiency under varied agro climatic conditions of the country. This technology has very good potential especially in peri-urban areas adjoining to the major cities which is a fast growing markets of the country, since it can be profitably used for growing high value vegetable crops like, tomato, cheery tomato, coloured peppers, parthenocarpic cucumber, healthy and virus free seedlings in agri-entrepreneurial models.**



**Points to
remember**

- **Protected cultivation technology requires careful planning, attention and details about timing of production and moreover, harvest time to coincide with high market prices, choice of varieties adopted to the off season environments and able to produce economical yields of high quality produce, etc.**
- **All kind of protected technologies may not be suitable and economical to all group of Indian farmers, because of their very high initial basic cost of fabrication, running and maintenance cost, but some protected technologies are not only low cost and simple but they are energy efficient and are highly profitable under different Indian conditions and more specifically for peri-urban areas, which can be adopted by Indian farmers for production of diverse high value vegetable crops and nursery raising in profitable agri-business models.**

- **Some of the technologies like low-pressure drip irrigation and low cost nursery raising technology are highly suitable for livelihood security even in tribal areas of the country.**
- **These two technologies have already been demonstrated successfully and have proved their suitability, efficiency and profitability in tribal area of Jharkhand, Madhya Pradesh, Gujarat and other states of the country.**
- **Similarly these technologies can also be replicated in other parts of the country among the small and marginal farmers. Protected vegetable cultivation technology is highly relevant under the era of changing climatic conditions and can be well adopted in big way under model vegetable farm concept or in cluster approach in peri-urban areas of big cities for not only supplying high quality vegetables in the niche markets of these cities but also stabilizing the huge fluctuations in market prices of fresh vegetables in these cities almost every year in India.**

Thank you...