

Protected Cultivation: A Ray of Hope for Small and Marginal Farmers

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ARTICLE ID: 023

The Horticulture production of India in the year, 2019-20 is **320.77 million Tonne**, an increase of about 9.72milliontonnes (increase of **3.12 %**) over 2018-19. Globally, India is the second largest producer of fruits and vegetables. The Export growth of fresh fruits and vegetables in term of value is 14% and of processed fruits and vegetables is 16.27%.The increased the economic significance of horticulture produce had slowly started to draw the attention of farmers towards horticulture. But due to the uncontrolled climate, the impact of biotic and abiotic stress had risen to peaks questioning the sustainability of production. This resulted in the drastic decline in the productivity which pushed the farmers into agonizing losses and also, to meet the future demands of enormously growing population, the horticulture production has to be raised to 540 million tons by 2050 from the current level of 277.35 million tons. But the possibility of increasing the horticultural production by enhancement of area is not a possible solution. In the trend of latest advancements in the agriculture and globalisation of the markets the protected cultivation emerged as a hopeful solution to farmers to overcome the losses and also to meet the requirement by increasing the productivity.

Protected Cultivation Protecting The Farmers:

The cultivation in which microclimate around the plant is modified either partially or fully i.e., to the extent at which the plant can cope up with adversities resulted due to climate changes.

NEED FOR PROTECTED CULTIVATION:

NURSERY RAISING AND HARDENING OF
PLANTS



Table 1: Crops Grown Under Protected Cultivation:

Seedlings and Nurseries	Vegetables, Flowers, Tissue culture saplings.
Vegetables	Tomato, Capsicum, Cucumber, Broccoli, Leafy vegetables, Radish etc.
Flowers	Chrysanthemum, Carnation, Gerbera, Rose, Lilium, Orchid, Gladiolus, etc.
Fruits	Strawberry

Types Of Protected Cultivation Structures:

The modernisation of the agriculture had made available the various type of structures for protected cultivation. These structures had been selected by the farmers based on the factors like cost, agroclimatic zone, kind of crop e.tc. Some of the important kinds of structures are:

Green House:

Greenhouse is a structure which is either framed or inflated with the transparent or translucent material under which the crops are grown in controlled climate. It is most used protected structure. These structures can be equipped with other automatic systems like irrigation and artificial intelligence can be used for several purposes data recording etc. It is the protective structure which is most often used.

Principle Of Greenhouse:

The greenhouse is covered with a transparent material such as plastic, pvc sheet or glass. Based upon its transparency the greenhouse cover transmits most of the sunlight. The crop, floor and other objects inside the greenhouse absorb the sunlight admitted inside the greenhouse. These objects in turn emit long wave thermal radiations for which the greenhouse

covering material has lower transparency and as a result of this the solar energy is trapped thus leading to increased temperature inside the greenhouse. This is known as greenhouse effect.

Classification Of Greenhouse:

The green house was classified based on the below aspects:

- a) based on shape
- b) based on utility
- c) based on construction
- d) based on covering material.

Poly House:

The greenhouse structure covered with specialised polythene sheet to regulate the climate is called polyhouse. Generally, the green houses are constructed with using wooden frames and glass as cladding material. The replacement of glass with plastic material resulted in conversion of greenhouses into polyhouses. Mostly the drip irrigation is used in the polyhouses.

Shade house:

This protective structure usually had a shade cloth over it which is used to protect the plants from excessive heat, light or dryness. The major factors to be taken care while selecting the shade cloth are:

- 1) **Colour:** The colours mostly preferred are black and green because they act like screens and deprive the plant from receiving more sunlight. Even other colours are also available such as white, red, yellow and blue. The lighter shade provides better ventilation by reflecting the more heat from the sun. In case of white shade cloths, the quantity of the light can be reduced but the quality is unaffected.
- 2) **Fabric material:** It is either knitted or woven. Knitted cloth is made of polyethylene blend. It is light weight and also deflects the heat and light. Woven cloth is constructed from polypropylene. It is 30% higher in both cost and weight compared to knitted.
- 3) **Density percentage:** The optimum percentage density will depend upon the crop grown under shade house.

Lath House:

These structures are had straight sides and flat tops. These structures provide protection for plants from high temperatures and light intensities. The frame is similar to shade house but the cover is flexible lath sash.

Hot Beds:

It is a protected structure which is used as artificial aid of providing adequate heat to the soil and plants grown during cold seasons. This results in adequate growth plants ahead of time. Depending upon the availability and financial independence, artificial heating systems like hot air, hot water and electricity are equipped with these structures.

Cold Beds:

It is a structure similar to hot bed. The only difference is that heat is produced from external source in case of hotbed. The sun is the only source of heat in case of cold beds. It is used to roof over the tender perennials.

TABLE 2: Protective Structure And Their Purpose

PURPOSE	TYPE OF PROTECTED STRUCTURE
Raising of seedlings	Polyhouse and Shade house
Growing Shade Loving Plants	Shade House
For Protection	Shade House and Green House

Cost-Effectiveness Of Protected Cultivation:

The monetary gains obtained by the farmers depends upon the investment and returns obtained comparatively with open field condition. The major aspect which results in huge profits is increase in the production. The other aspect is in case of open field conditions, the quality of produce is low i.e., increased levels of chemical residues due to their high usage. The protected cultivation reduces the investment by reducing their usage and also increase the quality by reducing their residues. The high quality of the produce provides all the access to various international markets and exports which fetches higher price to farmers compared to the produce of open field cultivation.

Supporting Initiatives Towards Protected Cultivation:



In order to support the progressive farmers financially, the government of India had initiated many schemes such as Horticulture Mission (NHM), National Horticulture Board (NHB), Rashtriya Krishi Vikas Yojana (RKVY) and Horticulture Mission for North East and Himalayan States (HMNEH) for the promotion and development of protected cultivation. The NHM provides huge assistance by offering a subsidy of 50% for setting up of protected cultivation structures and also provides 50% subsidy for purchase of planting materials, vegetables and flowers under polyhouse or shade house. Due to support provided by the government, area under protected cultivation by NHM in India was 14136 ha during 2005-06 to 2017-18.

Conclusion:

The advancements of the technologies related to the agriculture and supporting initiatives taken up by the government acts as major boost for the farmers resulting in rapid upsurge of area under protected cultivation. But the major challenges faced by the farmers in the path of adopting protected cultivation are cost of methods and lack of awareness about these methods. The government should come up with fruitful solutions to those obstacles which will provide protection to the farmers due augmentation of area under protected cultivation.