

Protected Cultivation Technologies: Boon for Flower Growers

Raveena¹, Arvind malik², Divya² and Neha²

¹Department of Horticulture, Maharana Pratap Horticulture University, Karnal-132001

²Department of Horticulture, CCS Haryana agricultural university, Hisar-125004

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Abstract

India has been identified as one of the major forces in the world floriculture scenario. We are compelled to use modern crop production methods like protected cultivation as a result of factors including population growth, climate change, shrinking land holdings, increased demand for high-quality products, and increased pressure on land and water resources. In protected agriculture, the surrounding microclimate is partially or completely controlled depending on the plant's needs. The optimal circumstances for light, temperature, humidity, CO₂, and air circulation are provided for the best growth of plants to attain the most yield and best quality produce, rather than to protect plants from unfavorable climatic conditions. Unemployed educated teenagers who are not drawn to or interested in conventional agriculture are also shown a strong interest in these contemporary agricultural technologies and may be further encouraged to do so. There are many different types of protected structures, including greenhouses, net houses, shade houses, hotbeds, and cold frames. The most feasible method for attaining the goal of protected cultivation is greenhouse technology. Protected agriculture also provides growers with advantages such as higher returns per acre, earlier harvests, longer harvest periods, less fertiliser leaching, and environmentally friendly insect, weed, and disease control. Protected agriculture raises both the standard of living and the sustainability of agricultural produce.

Keywords: Favourable climatic, insect, protected structures, weed, yield,

Introduction

In addition to addressing the rising demand in the domestic market, there is a huge potential market for the export of high value horticulture crops from India as a result of trade globalization and economic liberalization in India. In order to satisfy the demands of quality-conscious consumers, it is imperative that productivity and produce quality be increased. It is

necessary to make strides in production technologies that not only guarantee vertical productivity development but also integrate market-driven quality metrics into the production system. Protected cultivation, sometimes known as greenhouse technology, is one such approach. The three main elements that affect ornamental productivity and quality are quality raw materials, the growing environment, and cultural practices. Whereas control over quality of planting material and cultural practices can be fully exercised under open field cultivation, environment control is possible only under protected condition. The floriculture industry has annual growth potential of 25-30% and is capable of earning foreign exchange 20-25 times more than cereals or other agricultural crops. Protected cultivation is used to provide consistency in quality and quantity needed to reduce the risk associated with weather hazards, insect pest incidence, and a subsequent drop in production quality, particularly in open field circumstances. Only through protected cultivation technology may greater product quality (bigger diameter, larger stalk, colour stability), as well as better maintaining quality, be attained. So, the only method for attaining year-round production is protected cultivation. There are many different types of shielded buildings that can be used in particular agro climatic zones. For the cultivation of ornamentals, the green house, net house, shade house, hot beds, and cold frames are crucial.

Need For Protected Cultivation

Protected cultivation is practiced to ensure consistency in quality and quantity required to limit the risk due to weather hazardous, insect pest incidence, leading to reduction in quality production especially in open field conditions Other benefits include:-

- Early maturity and better quality of produce (more diameter, larger stalk, stability of color) and better keeping quality
- Higher production per unit area
- Round the year cultivation through high tech green houses
- Protection of valuable plant germplasm
- Hardening and acclimatization of tissue cultured plants.
- Protection from biotic and a biotic stresses
- Barren and uncultivable land may be brought under use
- Employment generation
- Increased yield (4-5 times then traditional planting)

Site Selection for green house:

- The selection site should be free from pollution.
- Water should be available regularly
- Supply of electricity should be regular
- Soil should be properly leveled and drained
- Polyhouse should be near to road side means proper approachable road must be there to go to poly house
- Some space should be there nearby for further extension
- Expertise and labors should be available when required.

Protected structures for protected cultivation of ornamentals

1. Green house
2. Shade net house
3. Insect net proof house
4. Walk in tunnel
5. Mist chamber
6. Lath house
7. Cold frames
8. Hot beds

Greenhouse

It is a framed or covered structure with a transparent or translucent material which permits ample sunlight for crop production and has provisions for at least partial control of plant environment. The natural temperature rise in the greenhouse is utilised during winters to grow crops with or without supplementary heat. During summers, the greenhouses are cooled as per the crop requirement. In general, crops in greenhouses are either grown on beds or in pots irrigated by micro-irrigation systems. Off-season flowers and ornamental/grow-bags, plants and nursery raising are fairly remunerative practices in protected cultivation.

Shade net house

A shade net house commonly known as conservatory or fernery, is used for keeping shade loving or partial shade loving ornamental plants e.g. ferns, orchids, anthurium, alocasia, cacti, succulents and foliage plants. The material used for shading a shade house split bamboo

matting, coconut leaves or coir fibers having open inter spaces to allow partial sunlight to enter.

Insect-proof Net House

These nets are installed in order to protect the crops from the harmful insects and virus transmitted diseases. Insect-proof net house can be fabricated as a temporary or permanent structure in different designs. It can be in a walking tunnel design and shape, with double door facility at one end of the structure. It is covered with UV-stabilised insect-proof net of 40–50 mesh for effective control of pests and diseases.

Walk-in tunnel

It is a temporary structure made by using GI pipes or bamboo, and is covered with different cladding material depending upon the season in which the cultivation is proposed. Walk-in tunnels are used for off-season cultivation of vegetables and flower seedlings. Clean plastic films or nets are stretched over low wire hoops to protect plants against frost, wind, insects and pests.. Plastic mulches and drip irrigation may be used in conjunction with low tunnels.

Mist Chamber

The main purpose of such a structure is to create high humidity and droplet-free presence of water for propagating delicate soft wood cuttings, and shrubs, etc. Cuttings are misted intermittently in place of continuous water application or drenching. The intermittent water misting is done using a high pressure pump, pipeline system and a timer switch.

Plastic Tunnels

These are miniature structures producing greenhouse like effect. Facilitates the entrapment of carbon dioxide thereby enhancing the photosynthetic activity. It protects plants from harsh climatic conditions such as rain, wind, hail snow etc. These are mainly used for raising nursery.

Lath house

Lath house are used to provide partial shade to plants like azaleas, hydrangeas during summer month in many localities. The frame is similar to that of shade houses, but the cover is movable. Lath houses are usually used to protect high light sensitive ornamental plants.

Cold frame

The cold frame is made with frame and the glass cover. Cold frames are used to protect plants from frosts heavy rains and heavy winds. These are used in winter for raising herbaceous Annuals, biennials and cut flowers and nursery of other perennial plants.

Hot beds

The main objective of hot bed is to raise seedlings earlier and protect them from weather hazards. A hot bed is one where heat is generated by decomposition of fresh manure. The heat generated is utilized for seed germination, which results in early nursery raising and protect them from weather hazards, especially during winters. The frame generally made of wood is filled in such a way that from back side it extends up to 30-35 cm and from front side 20-25 cm above the ground.



Advantages of protected cultivation

- Protection from excess rainfall, wind current, scorching sunlight and extreme cold conditions
- Under minimum space one can have maximum production of crop plants
- Humidity is maintained
- Efficient use of CO₂
- Minimum use of water and fertilizers
- A single person can have control over thousands of plants
- Diseases and pests can be controlled easily
- Production of crop throughout the year
- Protection from birds, animals and human activities
- Labor cost is reduced



Flowers grown under Protected cultivation	Rose, Liliium, Gladiolus, Gerbera, Carnation, <i>African violets</i> , Anthurium, Chrysanthemum, Orchids etc.,
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Insect-pest management practices under protected cultivation

Ornamentals are more prone to insect-pest as compared to other particularly under protected cultivation due to congenial environment condition.

Constraints of protected cultivation

- Agro-climatic constraints
- Lack of high yielding varieties
- Hurdles in transfer of technology
- Lack of technical know how
- Lack of adequate power supply
- Lack of quality planting materials
- Insufficient technical manpower
- Lack of post-harvest technology
- Lack of location specific polyhouse designs.
- Non availability of quality polyethylene sheet.

Future Strategies

- Encouragement of environmentally degradable material in floriculture.
- Development of need based polyhouse designs for different areas.
- Ensuring easy availability of U.V. stabilized plastic sheet and nets.
- Development of suitable varieties specifically for polyhouse cultivation.
- Work on eco-friendly nutrient and pest management to be taken up.

- Use of new hi-tech techniques under protected condition.

Conclusion

High value crops that are grown under protected conditions are now irreplaceable from both an economic and environmental standpoint. Growing high-value crops with better quality even in unfavourable and marginal conditions has a number of benefits. Protected cultivation technology is still in its infancy in India, and all relevant organizations must work together to bring it up to pace with international standards. The intended outcomes can be attained by economic liberalization and globalization together. A major factor in maintaining the pace of precision farming in Indian agriculture is greenhouse technology. Protected agriculture raises both the standard of living and the sustainability of agricultural produce. In ornamentals it is essential to develop appropriate cost effective greenhouse technology and organize special training programmes and demonstrations for enhancing the protected cultivation of ornamentals

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