

## Protected Cultivation: An Excellent Environment for Pest

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### Introduction

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.

### Objectives of Protected Cultivation

- Protecting plants from abiotic stress such as excess/deficit water, temperature, hot and cold waves, etc.
- Enhancing productivity of crops per unit of area.
- Efficient use of water and at the same time minimizing weed infestations.
- Reducing the use of pesticides and insecticides in the production of crops.
- Promoting high value, quality horticulture produces.
- Producing flowers, vegetables and fruits throughout the year and also in the off season.
- Producing disease-free and genetically better transplants.

There is different structure of protected cultivation viz.

- green house

- plastic tunnel
- shade net house
- walk in tunnels
- low cost polyhouse and
- plant protection nets.

However, this structure is advance technology but it becomes an excellent environment for pest due to presence of warm, humid conditions and abundant food under protected conditions, which provide an excellent and suitable environment for pest development. Insect predator, which is present outside environment condition, and keeps the insect pest under control are also absent inside the protected cultivation. Therefore, integrated pest management (IPM) is a systematic approach to manage the pests that combines a variety of techniques and strategies to reduce pest populations.

### Management

Since protected cultivation conditions allow fast development of pest populations, successful control of insect pests on greenhouse vegetables and ornamentals depends on several factors. But we can minimize pest population by using some key components i.e. structure, manure, water, and crop protection.

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**Structure:**

Protected cultivation structure should use proper screen size mesh, which can prevent movement of thrips, aphids, leaf miners, whiteflies and assuring adequate airflow. However, selection of screen with particular mesh size is site specific and depends on the prevalent pests of the crop in the area. Sanitation before planting is a basic component of cultural practices. It has been observed that insects can enter the protected structure in following three ways viz. a). Through infested seedlings/planting material; b) Infestation from other plants within the protected structure and c) Infestation from host plants outside but near the protected structures. Therefore, it is extremely important to eliminate pests from the previous crop before introducing a new crop into the protected structure. It is also important to remove all plant debris, weeds from the protected structure and use insect-free planting material. Single crop is suggested under protected cultivation. Before planting the nursery, examine them closely for signs of pest infestation symptoms.

**Manure:**

Fertilization schedules based on balanced use of nutrients should be followed. Nitrogen or bio-fertilizer, FYM should be applied only as needed for optimal growth. Periodic heavy applications set up nitrogen

surpluses that cause excessive growth, which favour the population growth of aphids, and other pests. Application of potassium at desired levels has been found to reduce the incidence of insect-pests problem. Soil health test should done regularly for better management of soil health inside the structure. Apply only properly composted or adequately aged manure.

**Water:**

Water is vital component in agriculture activities so important points to be kept inside and outside the structure of protected cultivation as follows:

- 1) Use of water from clean uncontaminated source.
- 2) Water storage tank should be kept clean and covered.
- 3) Use of water for all foliar applications should be from a disease free.
- 4) Maintain water bodies to prevent surface run-off from contaminating water supply. Run-offs may be managed properly and undesired run off may be diverted away from the structure.
- 5) Water logging should be avoided inside the structure.
- 6) Proper drainage system facilities should be construct outside the structure.

- 7) Adopt minimum energy utilization techniques including zero energy drip irrigation system.

### **Crop Protection:**

Maintenance of crop health is essential for successful farming for both yield and quality of produce. Integrated pest management practice should be followed for eco-friendly management of pest. Pest monitoring measures such as sticky traps should always be in place for timely action. Organic compounds or botanicals such as neem/products and their formulations, mineral oils, oil, talc biopesticide can use for crop protection in structure. Inside the structure colour trap and sticky trap should be installed for monitoring of pest incidence. Always use only registered pesticides and recommended dose for recommended crops. Monitoring or scouting is the regular, systematic inspection of the plants and exteriors to identify and assess pest problems. It includes inspection of foliage and flowers; and the use of insect traps. Many insect infestations begin in isolated spots within the greenhouse. Timely crop monitoring minimizes the expenditure and safe crop. Farming with all above mentioned components can suppress the pest population below the threshold level and set up a pest free environment in protected structure.