

## Protected cultivation in vegetable crops

**Pooja**

Ph.D Scholar, CCSHAU, Hisar

**ARTICLE ID: 038**

### **What is protected cultivation?**

Protected cultivation practices can be defined as cropping techniques wherein the micro climate surrounding the plant body is partially or fully controlled during their growth period as per the requirement of the plant species grown. It is also known as Controlled Environment Agriculture (CEA). It is conservative of land and water, very productive and protective to the environment.

### **Why protected cultivation is necessary?**

Protected cultivation offered a new dimension to produce more crops in a limited area of land as rapid urbanization, small land holdings, declining crop production and biodiversity, increasing population, demand for food especially vegetables are some constraints in agricultural production. It involves the cultivation of vegetables to attain maximum production in a controlled environment where temperature, humidity, light, soil, water, fertilizers etc. are manipulated even during off season.

### **Advantages of protected cultivation**

- Higher yield
- Year round cultivation
- Off season production
- Controlled pollination
- Better quality
- Weed free cultivation
- Least pesticide residues
- Vagaries of weather
- Assured production
- Self-employment for the youth
- Easier plant protection

- High water productivity
- Saving significant amounts of water
- Allowing farmers to take advantage of market seasonality and higher prices.

**Disadvantages:**

- High labour requirement.
- Higher cost of production.
- Initial capital investment is high.
- Skilful knowledge is required.
- Different production system under protected cultivation:

**Green house and polyhouse**

Greenhouse technology is suited to vegetable crops such as tomato, capsicum, cucumber, french bean, cabbage, chillies, spinach, cauliflower etc. The reason to grow vegetables in green house is to have crops when they can't be grown out side. Out of season tomatoes, cucumbers, peppers, lettuce and other vegetables command high prices in markets.

Depending on location, greenhouse design varies. Minimal climatic control is provided by simpler greenhouses and provide economic yield of vegetables crops. In the temperate regions, the highly controlled greenhouses i.e. glass houses are used to grow vegetables as the freezing temperature outside cause problems in growing the crops.

**Advantages**

- It minimizes environmental threats to the crops.
- It helps in growing different type and variety of crops.
- It helps to produce disease free and genetically superior transplants.
- Hydroponics, aeroponics and nutrient film techniques are possible only under greenhouse gardening.

**Disadvantages**

- It requires high operating expenses.
- Poor pollination takes place under greenhouse cultivation.
- It requires regular periodic inspection.
- Lack of awareness among farmers.

**Soil less culture**

Growing of vegetables in media other than soil is called as soil less culture. It is an artificial mean of providing plants with support and reservoir for water and nutrient. Media used are- coco pit, vermiculite, perlite, saw dust, rock wool, peanut hulls, rice hulls or the mixtures. As compare to soil based culture, soil less culture of plants involves a restricted root system and a reduced root zone.

### Hydroponics

It is a type of horticulture and a subset of hydro culture. It is a method of growing plants in nutrient solution in water, without soil. The plants may be grown with their roots in the mineral solution only, or in an inert medium, such as perlite and gravel. As hydroponically grown plants dip their roots directly into nutrient rich solutions, they get all the nutrients they need. They have smaller root system so more plants can be grown in less area and get more yield.



### Advantages

- Crops can be grown where the soil is not suitable for growing plants.
- Maximum yield is possible.
- Cost of labor is mostly eliminated.
- Conservation of water and nutrients.
- Environment can be manipulated according to our choice.

### Disadvantages

1. Construction cost is high.
2. Trained person must be required.
3. Consumption of electricity is high.

### Aeroponics

It is an advance form of hydroponics. It involves growing plants in a trough or container in which the roots are suspended and sprayed with a nutrient mist. The rooted plants are placed in a special type of box with computer controlled humid atmosphere. This method results in healthier plants, more growth and higher yield in few resources. In this system, oxygen is surrounding the roots at all time.



### Advantages

1. Unrestricted and natural growth
2. Reduces the incidence of disease
3. Disease free environment
4. Plants grow with higher density
5. Propagation from a single stem is possible

### Disadvantages

1. It requires constant monitoring
2. It is highly susceptible to power outages
3. Requires technical knowledge