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Protected Cultivation of Fruit Crops

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Introduction

Protected fruit cultivation has developed very quickly and widely and now it has become an important branch in fruit cultivation. It enables some control of wind velocity, moisture, temperature, mineral nutrients, light intensity, and atmospheric composition and has contributed and will continue to contribute much to a better understanding of growth factor requirements and inputs for improving crop productivity.

Why Protected Cultivation?

- Crops could be grown under inclement climatic conditions when it is not possible to grow in open field.
- Efficient utilization of precious inputs like water and nutrients.
- Early nursery and early cropping.
- Higher productivity – enhanced crop duration.
- Superior quality of the produce.
- In green houses having complete environmental control certain crops could be grown year round to meet the market demands.
- Off- season production of nursery and crops.
- Effective control against diseases, insect pests.
- Reduced expenditure on weed control.
- Hardening and acclimatization of tissue cultured plants.
- Protection against heavy rains, hails, birds etc.
- Hybrid vegetable seed production.

Various Types of Protected Structure for Fruit Production Green houses.

- These are framed structure covered with UV stabilized plastic film in which crops are grown under partially or fully controlled environments.
- Introduced in India in 1960 but commercial cultivation started in 1988.
- Average dimensions for fruit crops production – 10 m wide, 30 m long, 2.5 m eave height and 3.5- 4.0 m ridge height.
- Shape lean to type, even span, uneven span, Ridge and furrow, Saw tooth and Quonset.
- Covering materials Glass, Plastic film, Rigid panel and Shading net.
- It ensures production at any place at any time.

Polyhouse

- Polyethylene, polyester and polyvinyl chloride.
- 200 gauge plastics covering is very popular.
- Advantage - cost of heating is less as compared to glass greenhouses.
- Disadvantage - short life (four years) of plastic films.
- Quonset design as well as gutter-connected design is suitable for using this covering material.

Nethouse and Shade house

- Net house is naturally ventilated and climate controlled.

- Shade houses are structures enclosed by agro-nets.
- Mostly usable is 70% and 50%.
- These are used to reduce adverse effect of scorching sun and rains.
- Also used in quality drying of various agro products, grapes, citrus etc.
- Studied the plant of 5 cultivars of papaya to evaluate yield and various physico chemical traits under poly net house.
- Red lady786 took least no of days for harvesting.(295 days)

Glasshouse

- Glass as covering material has the advantage of greater interior light intensity.
- These greenhouses have higher air infiltration rate which leads to lower interior humidity and better disease prevention.
- Lean-to type, even span, ridge and furrow type of designs are used for construction of glass greenhouse.

Rigid Panel Greenhouses

- Polyvinyl chloride, fiber glass-reinforced plastic, acrylic and polycarbonate.
- It is employed in the Quonset type frames or ridge and furrow type frame.
- Advantage is more resistant to breakage and the light intensity is uniform throughout the greenhouse when compared to glass or plastic.
- Long life even up to 20 years.
- Disadvantage of using rigid panels is that these panels tend to collect dust, which results in darkening of the panels and subsequent reduction in the light transmission.
- It is significantly danger to fire hazard.

Tunnels

- A long, half cylindrical enclosure used to protect plants.
- Made of clear plastic stretched over hoops.
- Two types of tunnels , low tunnels and high tunnels.

a. Low Tunnels

Small structure (height 1m or less) and provide temporary protection, their use enhances early and total yield.

b. High Tunnels

High tunnels are protective structure tall enough that are used to lenthern the production and marketing season of the crop

Fruit Production Techniques Under Protected Structures

Characters of Fruit Crops for Protected Structure

- Rapid grower; Papaya, Banana, Strawberries.
- Dwarf characters; Pineapples and other dwarf varieties.
- It should have dwarfing rootstocks.
- Plant show good response for training and pruning and chemical regulation.
- Single stem fruit crops; Papaya, Banana.
- Branched species with dwarf characteristics.
- Crop varieties should be regular bearer with high yielder.
- Free from resistance biotic and abiotic stress.
- Short durables and early maturable.

Conclusion

Protected cultivation is developing very quickly and becoming profitable day by day

for the grower.

Single stem nature of fruit crops is technically feasible.

It is beneficial for producing export quality production.

Protected cultivation offers great scope to produce organic fruit, minimize insect pest incidence, avoid fruit cracking , prevent frost injury etc.

Branched species fruit crops are less favored in green house.

There is a need for the further research in other fruit crops regarding protected cultivation.

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