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# Center for Smart Agriculture

## Applied Hi-Tech Horticulture



### **Module 1: Introduction to Hi-Tech Horticulture**

### **Sessions 5: Design of Polyhouse**



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# Protected Cultivation

Protected cultivation is the modification of the natural environment to achieve optimum plant growth with high economic return.



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## Types of Polyhouse

1. Low cost or Naturally ventilated polyhouses.
2. Medium cost or Partial climate controlled polyhouses.
3. High cost or Fully climate controlled polyhouses
4. Plastic low tunnels
5. Net houses



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# 1. Low cost or Naturally ventilated polyhouses.

- ❖ Low initial investment
- ❖ Constructed with locally available material such as bamboo, timber etc.
- ❖ No specific control devices for regulating environmental parameters inside the polyhouse. Suitable during cold weather, especially in hilly areas.







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## **Medium cost or Partial climate controlled polyhouses.**

- ❖ The structural frame is made up of galvanized iron pipes.
- ❖ Exhaust fans are used for ventilation, these are thermostatically controlled.
- ❖ Cooling pad is used for humidifying the air entering the polyhouse.
  
- ❖ These are suitable for vegetable cultivation during mild winter and mild summer for the low hills in NW Himalayas.





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## High cost or fully climate controlled polyhouses

- ❖ Consists of sensors.
- ❖ Frame is made up of iron or aluminum.
- ❖ Designs are dome shaped or cone shaped.
- ❖ These are highly durable, 5-6 times costlier.
- ❖ Growing medium used in these type of greenhouses are Peat, Perlite, Vermiculite, Rock wool.
- ❖ In India coco fibres and rice husks are used as growing media as these materials are cheaper.
- ❖ Fertigation and pesticide sprays are done by fogging machine.





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**High cost or fully climate  
controlled polyhouses**



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## Plastic low tunnels

- ❖ Miniature form of polyhouse
- ❖ Protect the plants from rains, winds, low temperature, frost and other vagaries of weather
- ❖ Provide the best way for off season vegetable nursery production by modifying the microclimate around the plants
- ❖ Nursery bed of size 3x1x0.15 m
- ❖ A portable low plastic tunnel of size 3.5x1.20x1.0 m size with polythene sheet of 120 GSM is put on the nursery bed







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## Net houses

- ❖ Simple framed structure or small row like structure.
- ❖ Nets of 40 and higher mesh are effective.
- ❖ Control entry of flying insect.
- ❖ Save crop from viral disease.
- ❖ Netting to maintain an environment which also provide isolation from insect borne pollen.
- ❖ Netting allow controlled sunlight for the hardening of new plants taken out from nursery.





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# THANK YOU