Types of polyhouses

1) Based on environmental control system

a) ***Naturally ventilated polyhouse***: This type of polyhouse does not have any environmental control system except for sufficient ventilation and fogger system to save the crops from bad weather conditions and natural pests and diseases.

b) ***Environmental controlled polyhouse***: They are constructed primarily to extend the growing period of crops or to increase the off-season yield by controlling the light, temperature, humidity etc.

2) Based on shape

a) Lean-to

b) Even span

c) Un even span

d) Ridge and furrow

e) Saw tooth

f) Quonset

3) Based on suitability and cost

a) Low cost

b) Medium cost

c) High cost

Components and features of a polyhouse

1) Polyethylene- Polyhouses are made of transparent, tight, cheap and flexible polythene. Temperature and humidity can easily be controlled in polyhouses as they prevent thermal radiations from escaping which increases the temperature and energy and thus helps in the process of photosynthesis. It is well established that for the production of energy vegetables the polyhouses are constructed with the help of ultraviolet plastic sheets, so that they may last for more than 5 years.

2) Heating systems- Heating is usually required in cool season. Generally the solar energy is sufficient to maintain inner temperature of polyhouse but when this is insufficient, covering the northern wall of polyhouse with jute clothing, covering the whole of polyhouse with jute clothing during day and night, installing solar heating systems etc. can be considered.

3) Cooling systems-In summer season when ambient temperature rises during day time, cooling of polyhouse is done by providing adequate ventilation and removing the internal air of polyhouse out of it in a natural manner or by installing high power fans. Water misting mechanism can also be installed

4) Shading Systems-Certain plants are damaged due to very high light intensity during summer. Shade paints, agro-shade nets or retractable thermal screens are generally used.

5) Watering Systems-Water quality is very important and is often overlooked. The water sources should be tested before a polyhouse is established. Micro irrigation systems like drip irrigation or sprinklers can be used. Equipments required for drip irrigation includes

- A pump unit to generate 2.8kg/cm.sq.pressure
- Water filtration system-sand/silica/screen filters
- PVC tubing with dripper or emitters

6) Fertigation-It varies from single broadcasting of fertilisers to the use of soluble grade fertilisers over different operating systems.

General problems of fertigation-Nitrogen tends to accumulate at the peripheral zone of wetted soil volume. Hence roots at the peripheral wetted zone will have more access to nitrogen. Nitrogen is lost by leaching and denitrification. Phosphorous accumulates at the emitter and the phosphorus fixing capacity determines the efficiency. Potassium moves both laterally and downward and does not accumulate near the emitter.

7) Environmental control

a) ***Temperature***: A thermostat can be coupled to water circulating pump or exhaust fan for controlling the temperature inside the polyhouse.

b) ***Light***: In certain areas where natural illumination is very low, illumination can be provided artificially by incandescent bulbs, fluorescent tubes.

c)***Relative humidity***-A humidistat coupled to water circulating pump or exhaust fan is used to control the relative humidity inside a fan and pad polyhouse. The relative humidity in non-ventilated polyhouses can be increased by providing foggers.

8)Media preparation-The media used in polyhouses have chemical and physical properties which are distinct from field soils.

- The medium should be well drained
- A desirable medium should have a good balance between physical properties like water holding capacity and porosity
- pH of 5.0-7.0 and soluble salt (EC)of 0.4dS/m is optimum for most of the polyhouse crops
- Low pH can be raised by using amendments like lime and dolomite, high pH can be reduced by amendments like gypsum, Epsom salts, urea, ammonium nitrate etc
- Polyhouse growing media may contain harmful pathogenic organisms, nematode, weed seeds so it should be decontaminated by heat treatment. It can also be achieved by fungicides and pesticides.

Fumigation in polyhouse- Physical propagation facilities such as containers, knives, benches, working area etc are to be disinfected. Care should be taken to disinfect the seed or planting materials before they are moved to polyhouse.