RAMA UNIVERSITY, KANPUR, UTTAR PRADESH

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Course: Hi- tech Horticulture (UGE-321)

Lecture-5

Protected Cultivation: Advantages of Controlled Conditions,

The impact of abiotic and biotic stresses under the present changing climate dictates the crop production and quality. The foremost constraints in horticultural crop production in North Indian condition are the extremes of temperature, sunlight, water, relative humidity, weeds, nutrient deficiency, wind velocity, carbon dioxide concentration and diseases and insect pest incidence. Protected cultivation means to grow with improved quality out of season under protected structures, thereby increasing the profitability for the farmer especially in hostile climatic conditions. This technology has a potential to cater for supply of high quality vegetables, flowers and fruits in the peri-urban areas by reducing the transportation time and delivering fresh produce. Greenhouses are structures covered with transparent material such as polythene or glass. The covering acts like a selective radiation filter and allows short wave length solar radiation to pass but traps the long wave length radiation. The long wave radiations emitted by the plants and objects in the greenhouse cannot pass through the covering material owing to its lesser transparency for it. This results into rising of the temperature inside the greenhouse due to trapped solar energy inside the greenhouse (greenhouse effect). The increased temperature inside the green house affects the leaf temperature, which in turn influences the leaf transpiration, stomatal aperture and also the photosynthetic rate of the plants. The climatic control in the green house can be used for altering the physiological conditions of the plants. Closing of the greenhouse during the night the rises the CO2 level resulting from respiration by the plants that in turn is used for photosynthesis by the plants during the early morning hours of the following day. The rise in temperature, relative humidity, CO2 level and enriched nutrition under protected conditions of the greenhouse is accountable for fast growth and increased production. The temperature in greenhouse can be brought down by providing cooling through ventilation, fogging or operating the fan pad system. This facilitates round the year production of desired vegetable crops and exploits their maximum yield potential. Higher plant density by closer planting and higher number of fruiting branches per unit area under protected cultivation increases the yield tremendously.

Advantages

- Provides favorable micro climate conditions for the plants.
- Cultivation in all seasons even underλ extreme conditions is possible.
- High yield with better quality per unit area.
- Longer production cycle Needs less irrigation due to moisture conservation.
- More suitable for off season/ high value crops.
- Hygienic production due to less sprays of toxic pesticides Better disease and pest control.

- Helps in early raising of nursery.
- Round the year propagation of elite planting material.
- Protection from wind, rain, snow, birds, hail etc.
- Generates self employment for educated youth.