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Protected Agriculture in India

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INTRODUCTION

Protected agriculture

Use of technology to modify the natural environment that surrounds a crop in order to harvest a higher yield, greater quality, during an extended season.

Concept

Perpetual demand of vegetables and shrinking land holding drastically, protected cultivation is the alternative and drudgery-less approach for using land and other resources more efficiently. It ensures high productivity per unit area with the genetic potentially of the crop being fully exploited, off season vegetables can be grown which fetch high prices in the market, off season healthy nursery can be raised, good quality produce free from any blemishes and finally it is easy to protect the crops against pests. The greenhouses are usually covered structures of plastic film which allow the solar radiation to pass through it but traps the thermal radiation emitted by the plants inside. The CO_2 released by the plants at night also trapped inside, which increases the rate of photosynthesis at day time. The evaporation from the soil and plant also raise the humidity inside.

Prerequisites for protected cultivation

Fully climate controlled, Partially climate controlled, Purely naturally ventilated greenhouse, Walk in tunnels, Insect proof net houses, Plastic low tunnels.

Low cost greenhouse/ polyhouse

Zero energy chamber made of polythene sheet of 700 gauge supported on bamboos with sutli and nails. Its size depends on the purpose of its utilization and availability of space. Like the greenhouse it has one opening kept azar for 1-2 hours during the day, especially in the morning to reduce the level of humidity inside. The structure depends on sun for energy. The temperature within polyhouse increases by 6-10^{o}C more than outside. The solar radiations entering the polyhouse is 30-40% lower than that reaching the soil surface outside.

Medium cost greenhouse/ polyhouse

Slighly higher cost, a Quonset shaped polyhouse (green house) can be framed with GI pipe (class B) of 15 mm bore. This polyhouse has single layer covering UV stabilized polythene of 800 gauge. The exhaust fans are used for ventilation those are thermostatically controlled. Cooling pad is used for humidifying the air entering the polyhouse. The polyhouse frame and glazing material have a life span of about 20 years and 2 years respectively.

Hi tech greenhouse/ Polyhouse

Consist of a sensor, a comparator and an operator. The temperature, humidity and light are automatically controlled. These are indicated through sensor or signal receiver. Sensor measures the variables, compare the measurement to a standard value and finally recommend to run the corresponding device. This modern structure is highly expensive, requiring qualified operators, maintenance, care and precautions.

PHOTOSELECTIVE NETTING

Photoselective nets were designed to selectively filter different spectral bands of solar radiation, and/or transform direct light into scattered light. The spectral manipulation intends to specifically promote desired physiological responses, while the scattering improves the penetration of the spectrally-modified light into the inner plant canopy. Thus, the replacing of the traditional black shade net by either a Red, Yellow or Pearl nets (ChromatiNets™) of similar shading factors, resulted in 15-40% higher fruit production in different cultivars. The major response to the photoselective filtration was producing more fruits per plant, with essentially no reduction of fruit size or quality. Additional benefits relate to photoselective improvement of pest control.

Protected agriculture with or without soil gives profitable results.

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