

Protected Cultivation of Parthenocarpic Brinjal (*Solanum melongena* L.)

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Abstract – Brinjal is a warm season vegetable crop and rich source of antioxidants, minerals and vitamins. Due to high insect-pest incidence, it has now become difficult to grow this crop without use of pesticides. Farmers are using pesticides having longer residual effects. It is serious health hazard threat as the pesticides residues are also found in our food chain. With the development of parthenocarpic hybrids in brinjal, now it is possible to grow it under the protected conditions. It will ensure the safer production of brinjal without using harmful chemicals. It will also provide off season supply of quality brinjal with attractive colour and better taste.

Keywords – Brinjal, Insect-Pest, Parthenocarpy, Protected Cultivation.

I. INTRODUCTION

Brinjal, also known as egg-plant or poor man's crop and is popular vegetable grown in almost all over the world. It is perennial but grown commercially as an annual crop. Brinjal is rich source of anthocyanin, calcium, phosphorus, iron and also contain vitamins particularly of B-group. It acts as an excellent remedy for those suffering from liver complaints and also stimulates the intrapeptic metabolism of blood cholesterol. Brinjal is mainly infested by the insect-pests particularly fruit and shoot borer (*Leucinodes orbonalis*). It is difficult to control the insect-pests in the crop. The farmers in Karimganj district of Assam are using a huge quantity of pesticides, herbicide and fungicides for protection of the brinjal crop and better yield [1]. They are being exposed to a large number of health hazards directly and indirectly. These people suffer from various chronic diseases like indigestion, gastric problems, weakness and also low mental development. The existing pattern of pesticide usage, if continued, will result in undesirable effects which include resource degradation, resurgence of pest populations, environment pollution and human health-hazards. Although farmers are interested in cultivation of pest-resistant varieties which are not likely to develop in the immediate future. Therefore, protected cultivation of brinjal crop can be a promising technology and a better option to minimize the use of chemicals along with better quality fruits.

II. SOIL AND CLIMATIC CONDITIONS

Brinjal can be grown practically on all type of soils from light sandy to heavy clay. Silt loam and clay loam soils are generally preferred. Soil should be deep, fertile, well drained and pH should be 5.5-6.8. Brinjal requires a long

and warm growing season with an average temperature range of 21 to 27 °C. It is susceptible to severe frost and temperature below optimum affects yield and quality. But, it can tolerate drought and excessive rainfall. It also remains vegetative under high temperature and humidity. Lack of pollination is the major concern under the protected conditions. Parthenocarpy in brinjal can be utilized to grow a successful crop as the development of parthenocarpic fruits (Seedless fruits) does not require pollination. Being native crop of India, it has wide range of germplasm in our country but still there are very few parthenocarpic hybrids. Sharapova and Fantastic are among the F₁ hybrids which can be grown successfully in protected structures such as walk in tunnels and naturally ventilated polyhouses.

III. NURSERY RAISING

Since in parthenocarpic hybrids, each and every seed is important and need its assured germination. To ensure it, quality seedling can also be produced in protected environment with use of soil less media. It comprises of cocopeat, perlite and vermiculite mixed in 3:1:1 ratio by volume respectively. Cocopeat is prepared from the waste of coconut husk in southern states of India. The medium has good porosity, improved drainage and good air movement activity. Vermiculite is heat expanded mica. It is very light in weight and has minerals (magnesium and potassium) enriching the mix and neutral in reaction (pH). Whereas, Perlite is essentially heat expanded aluminium silicate rocks. Its role in the mix is to improve aeration and drainage. Mixture is filled in pro-trays and seed is placed carefully. One gram of brinjal seed contains 200 seeds. For transplanting in August, seeds should be sown in mid-July. It takes 6-8 days to germinate after sowing. At the stage of 8-18 days after germination, a spray of 2gm/l dose of N:P:K (19:19:19) followed by another spray of Calcium nitrate @2gm/ltr on 15-20 days after germination [2].

IV. CULTURAL PRACTICES

Soil sterilization can be achieved by both physical and chemical means. Physical control measures include treatments with steam and solar energy. Chemical control methods include treatments with fumigants. By physical means soil is ploughed and then left as such for approximate two months (June-July) in the closed poly-net house structures by keeping side rollings down. The incoming solar radiation penetrates in the transparent

polysheet. The radiation is then converted into heat energy, which raises the soil temperature. It kills many weed seeds, nematodes and resting stages of insects and diseases. Chemical treatment can be done with the 2% formalin solution [3]. Drench the beds with solution of Formalin by applying 4-5 litres of solution per square metre. Cover beds with a plastic sheet/tarpaulin. After applying the solution soil is covered with polythene sheet for 4 to 6 weeks. After removal of sheet, turn the soil in beds once a day for 4 to 5 days to eliminate Formalin.

Seedlings at 4 to 5 leaf stage are ideal for transplanting. Transplanting can be done on the both sides of one meter wide raised beds keeping plant to plant spacing at 80-90 cm. Farm yard manure is well mixed before the preparation of beds. After installing the drip system on the beds, plastic mulching sheet of 25 micron having one side black and other silver colour should be used on the bed for conservation of moisture with in the soil and to prevent the weed growth. The sheet should be spread in such a manner that black colour should be downside and silver to upside. Transplanting should be done in the evening time and water should be applied immediately. Daily water requirement of single plant is 0.75 litre at the initial growth stage and 3.25 litre at peak growth stage [4]. This water requirement of brinjal can be met by applying irrigation at alternate day or at 3 days interval with drip as per the package of practice of National committee on Plasticulture in Horticulture. Application of 25 ton/Ha FYM along with each 60 kg/ha P₂O₅ and K₂O has been recommended. Nitrogen is applied @ 100 Kg/Ha in 5 to 6 split doses during the crop growing season through fertigation [4].

Training and pruning are very important cultural operations in protected cultivation as crop needs proper aeration. Brinjal crop should be trained by keeping two main shoots which helps in utilizing vertical space, avoid overshadowing of plants. Leaves at the base that are dried or touching the ground should be removed. It helps in the proper translocation of food material to the upper productive portion of the plant. Fruit harvesting starts in the month of November and it remains productive till May. Fruits should be harvested when they attain a good size, attractive colour and its surface should not loose its bright and glossy appearance. Timely harvesting of tender fruits increases the total growing period and number of pickings alongwith yield. Average yield per plant is 3-4 kg/ha. can be achieved if the practices are followed properly.

V. CONCLUSION

The present article emphasizes the advantage of protected cultivation in brinjal crop for farming community as it is cost effective technique and fruit grown ultimately by this method is safe to consume because use of pesticides is negligible under protected conditions.

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AUTHOR'S PROFILE



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