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Economic evaluation of greenhouse for cultivation of papaya nursery

S.H. SENGAR AND S. KOTHARI

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See end of the article for authors' affiliations

Correspondence to:

S.H. SENGAR
Department of Electrical and Other Energy Sources, College of Agricultural Engineering and Technology, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli, RATNAGIRI (M.S.) INDIA

ABSTRACT

Raising of papaya nursery is quit difficult due to low temperature in winter season. Looking to the importance and temperature requirement for nursery raising for proper growth in winter, Papaya (*Carica papaya*)were selected for experiment under arch shape greenhouse. The total construction cost of 80 m^2 arch shape greenhouse was Rs.100000/-. Out of total 80 m^2 floor area, 55 m^2 area is used for plant seedling and 25 m^2 areas is left for movement in the greenhouse carrying out agricultural operations. In 55 m^2 area of greenhouse, 9700 seedling could be raised with 0.075 x 0.075 m spacing in 20 pits. Suitability of the economics of greenhouse, four economic indicators such as net present worth, internal rate of return, benefit cost ratio and pay back period were calculated for papaya nursery.

Key words : Net present worth, Internal rate of return, Benefit cost ratio and pay back period.

In India, major problem is the small field size, water scarcity, high temperature and low humidity. More than 58 per cent of operational holdings in the country have size less than 1ha. In such condition farmer adapted high input agriculture practices with minimum yields (1 t ha^{-1}) in rain-fed arable land. Creating awareness amongst farmers about consequences of applying imbalanced doses of farm inputs like irrigation, fertilizers, insecticides and pesticides. There is a scope of implementing precision farming for commercial as well as horticultural crops nursery shows a wider scope for improving the economical condition of farmer.

These conditions make nursery raising and its growth quite difficult. Greenhouse maintains an atmosphere more or less conditioned as regards to temperature, carbon dioxide, humidity and radiation energy so as to encourage crop growth, maturity and sometimes to improve the yield, safeguard the crop and make effective use of water.

METHODOLOGY

For successful plantation programme, cuttings was raised first in nursery bed. These pits were filled with proper mixing of sand and vermicompost. Locally available garden soil, sand and vermicompost (1:1:1) were mixed properly. After two days, Bavastine (fungicide) @ 2 g/l is sprayed over it. The mixture was filled and leveled in dried and clean pits.

Production of healthy plants is important where the planting stock is raised from and maintain for about some months (Thakur and Thakur, 1993). Cultivation of nursery also improves the overall growth of plant substantially in terms of height as compare to outside condition. A study, therefore, undertaken to find out the suitability of greenhouse and their economics for nursery raising, where overall growth of plants is very important.

For the success and commercialization of any new technology, it was essential to know whether the technology was economically viable or not. Therefore, an attempt was made for estimation of economics of the greenhouse. Different economic indicators were used for economic analysis of arch shape greenhouse under this study (Kothari and Panwar, 2004).

Net present worth (NPW):

The NPW is defined as the difference between present worth of savings and cost of investment. The mathematical statement for net present worth can be written as:

$$NPW = \sum_{t=1}^{t=n} \frac{B1 - C1}{(1+i)} = 0$$ (Kothari *et al.*, 2001)

where,

Ct = Cost in each year, Bt = Benefit in each year, t = 1, 2, 3...n, i = discount rate

Internal rate of return:

The internal rate of return is threshold rate at which the NPW is zero. Internal rate of return is the discount rate i such that

$$\sum_{t=1}^{t=n} \frac{B1 - C1}{(1+i)} = 0$$

Benefit cost ratio:

This ratio was obtained when the present worth of the benefit stream was divided by the present worth of