

Eco-Friendly Tunnel for Small and Marginal Vegetable Growers

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SUMMARY

Vegetables are an important constituent of Indian agriculture and nutritional security. Less seed germination percentage, less vigour, non-uniform growth finally do not achieve potential yield in the main field keeping in this view low tunnels with locally available ecofriendly/user friendly shading material will be alternative to overcome biotic and abiotic stress among small and marginal vegetable growers. The technology developed by using “U” shaped tunnel covered with coarse and loosely woven jute bag equipped with micro jet were used for raising vegetable seedling and leafy vegetables.

INTRODUCTION

In the Konkan region of Maharashtra State, leafy and solanaceous vegetables namely brinjal and chilli are common in rice based cropping system and are commercially grown during rabi-summer season after harvesting of paddy. However, under changing climatic conditions brinjal and chilli nursery get suffered from prolong low temperature, sudden increase in high temperature range, reducing in atmospheric humidity. Ultimately it results in non-uniform seedling growth, loss of vigour and remarkably less field establishment, which finally affects the potential yield. Nursery raised beds sized low tunnels with locally available ecofriendly/user friendly shading material will be an alternative to overcome abiotic stress among small- marginal vegetable growers. Under such conditions, intensive care during juvenile/nursery stage is pre-requisite for quality production. Economical and user-friendly protective covering during nursery stage will be solution for small and marginal farmers to protect vegetable nursery against biotic and abiotic stresses.

Principle:

Development of micro environment under the technology developed by using ‘U’ shaped tunnel covered with coarse and loosely woven jute bag equipped micro jet is not only protecting vegetable seedlings and leafy vegetables from biotic and abiotic stresses including vigour and yield.

Construction of Low Tunnel:

‘U’ shaped tunnels of 3 m x 1 m size were prepared from black mild steel (6 mm) which was fitted to the nursery raised bed size of 3 m x 1 m with the height 45 cm at the center. Three micro jets were arranged at the distance of 35 cm along the length of the raised bed.

Types of Covering Materials:

We can use simple, economical and user-friendly protective coverings vary from, dried coconut leaves, coarse and loosely woven jute bag, shade netting (25, 50, 75 %) and simple film plastics (passive protected cultivation) on inverted ‘U’ shaped structures well fitted with optimum size of nursery raised beds. It is movable shade, applied only during sunny periods, is less deleterious than constant shade (Adams *et al.*, 2001). Shade netting not only decreases

light quantity but also alters light quality to a varying extent and might also change other environmental conditions (Shahak *et al.*, 2004), (Kittas *et al.*, 2009).

Effect of Coarse and Loosely Woven Jute Bag Tunnel on Growth of Chilli and Brinjal Seedlings and Leafy Vegetables:

The overall growth performance of brinjal and chilli seedling was found best in “U” shaped tunnel covered with coarse and loosely woven jute bag *i.e.* minimum weeks required to attain transplanting stage, plant height, number of leaves, number of roots, leaf area, length of root, diameter at collar region, plant spread, fresh and dry weight of seedlings. While, considering the leafy vegetables namely amaranth, radish, fenugreek and mustard they required minimum days for germination as compared to open field condition. With regards to weather parameters, including atmospheric humidity, atmospheric temperature and soil temperature was observed during experimental period. The lowest soil and atmospheric temperature was observed in “U” shaped tunnel covered with coarse and loosely woven jute bag. The highest soil and atmospheric temperature was recorded in “U” shaped tunnel covered with low density polyethylene paper. Further, the highest atmospheric humidity was noticed in “U” shaped tunnel covered with 75 per cent shade net. The lowest atmospheric humidity was in control *i.e.* without coverings.



Experimental view of plot



“U” shaped tunnel coarse and loosely woven jute bag



Growth of brinjal chili seedlings at transplanting stage

CONCLUSION

From above investigation it is concluded that growth performance of chilli and brinjal seedlings and leafy vegetables was found best in “U” shaped tunnel coarse and loosely woven jute bag with minimum weeks required to attain the stage of transplanting and minimum period for production of leafy vegetables increasing more cycles in a year.

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