

A NEW TECHNIQUE FOR THE RAPID MULTIPLICATION OF PEPPER PLANTING MATERIAL

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INTRODUCTION

Investment oriented pepper development programmes of the public sector together with the needs of the large and small scale growers of the private sector, demand large quantities of pepper planting material amounting to hundreds of thousands of rooted cuttings. This enormous demand could never have been met if the traditional methods of propagation of the limited sources of high yielding material were followed. Therefore, to meet the requirements of major development programmes, the research project at Matale of the Department of Minor Export Crops, Govt. of Sri Lanka began in 1976, investigations to develop suitable techniques for the rapid multiplication of pepper planting material. The method reported in this paper is the result of these studies.

INFLUENCE OF NUMBER OF NODES ON ROOTING OF CUTTINGS

Traditional practice in all pepper growing countries has been to use cuttings with several nodes for purposes of propagation, ground runners being popular in India while erect growing vines being used in Malaysia. Since the number of rooted cuttings that can be produced from a given quantity of propagating material is very much dependent on the number of nodes in each cutting, some investigations were carried out on this problem. The results showed that cuttings with even one node can be as successfully used for propagation as cuttings with several nodes. This was especially true of Panniyur-I pepper. This finding was invaluable since it meant that a much larger number of vines can be established from the limited quantities of superior genetic material.

THE TECHNIQUE

A further and major development in pepper propagation was made in 1977 at Matale Research station by using principle of allowing a vine to climb on a column of rooting medium (a mixture of cattle manure and coir dust) instead of on a live or dead wood support. If the vine is kept in contact with the medium by tying, each node puts forth roots into the medium. Thus each node segment is already

rooted and can be severed and planted in polythene bags. In this way there is no loss of time as in traditional methods for rooting to commence and provide nutrition for the developing buds and shoot.

A convenient method of providing a column of rooting medium for the vine to climb is to fill a longitudinally split section of bamboo of suitable length with the mixture and place it in an angled position beside a young growing pepper vine. For this reason this rapid method of pepper propagation has now acquired the name 'Bamboo Method'. The working details of this method are as given below.

Parallel trenches of $1/4$ to $1/3$ metre width and depth and of convenient length are dug at a distance of about $2/3$ metre apart. Each trench is filled with a mixture of equal parts of top soil, organic manure, coir dust and sand. One per cent by weight of superphosphate is added to the above mixture and well mixed into it. It is better that the parallel trenches are aligned in an East-West orientation, rather than North-South. Midway between two parallel trenches and at a height of about half metre above ground a wire is stretched and fixed to the support planted at about 3 metres apart and firmly fixed into the ground.

Bamboo of about 10 cm diameter and 1.5 metre in length are split length-wise into equal halves, leaving the septa in place in each half. The split halves of bamboo are then arranged to rest on the ground in the mixture filled trenches and the curved side of the bamboo to lean against the stretched wire, at an angle of about 45° to the ground (Fig. 1). A bamboo

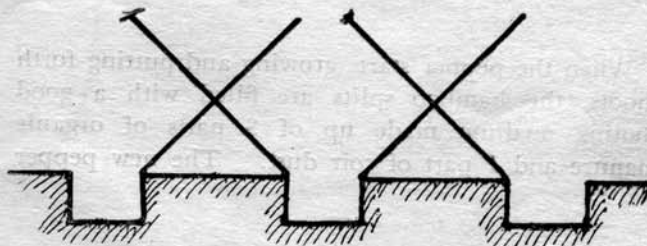


Fig. 1 Arrangement of trenches and bamboo.

resting on one trench should alternate with a bamboo resting on the adjacent parallel trench so that there is a separation of about 10 cm. between bamboos of the same side (Fig. 2). It is advantageous to treat



Fig. 2—Alternate arrangement of bamboo.

the bamboo with some wood preservative prior to setting them up in order to minimize rot and decay.

Rooted pepper cuttings are then planted at the rate of one each at the base of each bamboo. These cuttings are shaded and watered daily. Once in fifteen days about 250 ml. of a nutrient solution (1 kg. Urea, 3/4 kg. Conc. Superphosphate, 1/2 kg. muriate of Potash and 1/4 kg Kiesarite in 250 litres of water) may be applied per vine.

When the pepper starts growing and putting forth shoots, the bamboo splits are filled with a good rooting medium made up of 3 parts of organic manure and 1 part of coir dust. The new pepper

shoots must be carefully tied to the bamboo with twine or strips of banana leaf sheath in such a way that the young adventitious roots of each node rest against the rooting medium in the bamboo split, facilitating the growth and spread of roots into the rooting medium. Only one or two shoots should be allowed to grow depending on the size of the bamboo.

The composition, compaction and moisture level of the rooting medium in the bamboo is important. If it is too loose, it may get washed out, while if too hard and dry, the root penetration will be poor. Incorporation of a little top soil to the rooting medium may be beneficial to keep the same in position in the bamboo.

It takes about four months for the pepper vine to claim up to about 1½ metres, and in this length of vine there will be about 12 to 15 nodes. At this stage the terminal bud should be nipped off, and at a point three nodes from ground level, the vine should be crushed. This is done to activate the axillary buds to put forth new shoots. Adequate watering is continued, for a further two or three weeks, after which the vine is cut at the crushed region and carefully removed with as much of the rooting mixture as possible. The vine is then segmented into single node cuttings (Fig. 3) and each cutting planted in a poly-

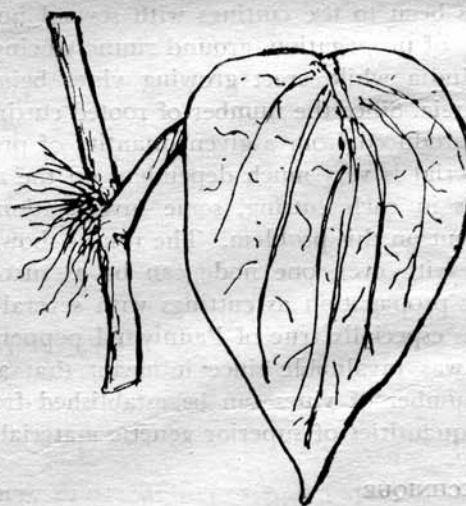


Fig. 3—Pre-rooted pepper cutting.

thene bag filled with potting mixture of the same composition as used for the trenches ensuring that the

leaf axil is above the soil surface (Fig. 4). The cutting so prepared are drenched with 0.1 per cent wett-

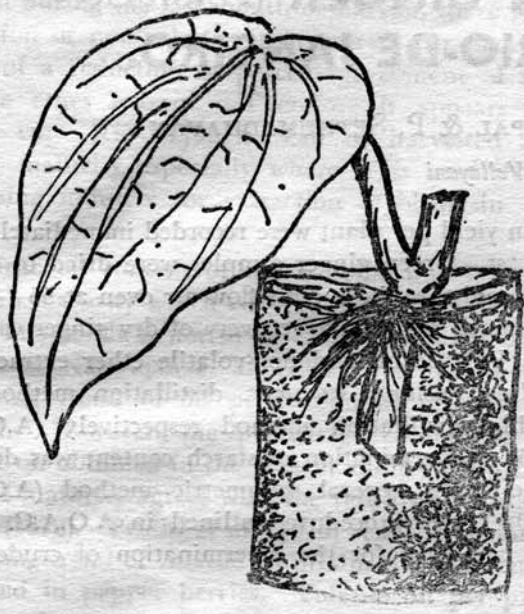


Fig. 4—Pepper cutting potted in polythene bag.

able Ceresan solution. The bags are then neatly arranged in a humid chamber which receives about 50% of full sunlight. For providing a convenient and cheap humid chamber the polythene bags may be arranged in a rectangle of not more than one metre width and of any convenient length. Bamboo strips of about 1½ metre length or metal rods of about 3 milli-metre diameter are then placed in arcs over the bags to form a frame, over which a polythene sheet may be spread to cover all the bags. The edges of the polythene sheet are weighted with soil or bricks to keep it in Place (Fig. 5).

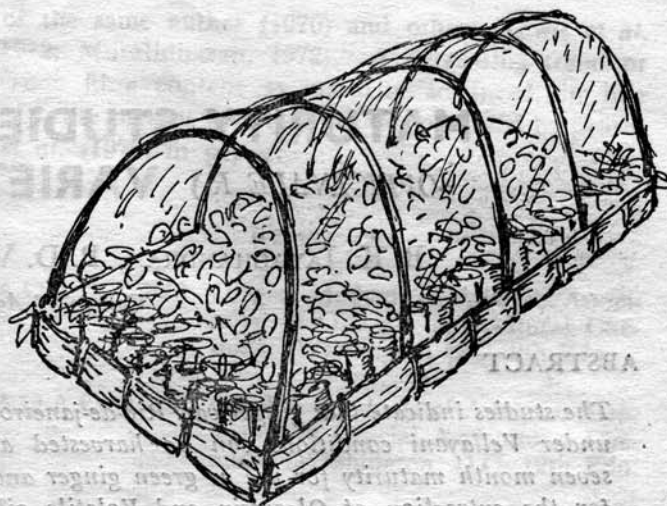


Fig. 5—Potted cuttings in the humid chamber.

The bags are watered daily. About three weeks later the polythene sheet is gradually removed. After a further three or four weeks of hardening the plants are ready for field planting.

The pepper plants that are cut back to three nodes at the base of the bamboo will put forth new shoots. Only one or two shoots should be allowed to grow. Since the pepper plants now have a well established root system, the vine climbs upto the bamboo top in about three months instead of four as earlier. Further extraction of single node cuttings are done as before, and the process repeated as often as desired.

On this system, an individual starting with a single rooted pepper cutting, may multiply it about 120 fold within a year. Alternatively, a nursery man who is issuing out rooted pepper cuttings can get about 40 rooted cuttings from each bamboo per year. If one hectare of land is put under this technique of multiplication, about 2.5 million rooted cuttings can be produced annually.

