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Vegetative propagation of *Eucalyptus* species through polyglobule

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Abstract
Macro-propagation of *Eucalypyus* species is possible on large scale through relatively cheaper technique with polyglobule than automatic and low cost chambers. Further it also gives an added advantage in controlling diseases and their spread as it is confined to the specific polyglobule. The spread of the humidity and temperature in the polyglobule are uniform unlike other large mist chambers.

Keywords: Vegetative propagation, polyglobule, *Eucalypyus* sp.

INTRODUCTION

Vegetative propagation is widely used in agriculture and horticulture. Of late there has been a growing interest in the use of this method for establishing forests and research programs connected with the tree improvement (Compinhos and Ikemori, 1983). Currently the research activity in forest regeneration is cantered on vegetative propagation (Zobel, 1983) of *Eucalyptus* plantation were mostly raised through seeds of unknown origin which exhibited a considerable variability for morphological and growth characters. It is mostly attributed to the genetic segregation owing to here heterozygosity of the seed plants (Jamblale and Patil, (1996). Compinhos (1984) rightly recommended cloning which has major advantage of transferring whole genetic potential. So that, the original display, the same behaviour of the original tree (+tree). Unlike half-sibs (seedlings of open pollinated seeds) using mist chambers (low cost and automatic mist chamber technique) for vegetative propagation of *Eucalyptus* well understood. However it requires heavy initial investments for equipment, electricity nozzles, cooling pads etc. Thus the increasing cost of production of the clonal plant. Further it is also not possible to operate those systems in the interior areas of our forests. Not only from expenditure point of view but also management and protection are problematic.

In view of the above; we have developed a propagation chamber model called polyglobule; to overcome the problems of mist chambers in vegetative propagation of *Eucalyptus,* other tree plants, in horticulture and in research labs. In this paper we describe the technique and its advantages over the earlier methods.

MATERIALS AND METHODS

This study was undertaken at the forest development centre, Mulugu, Medak district nearby Hyderabad, Telangana State, India.

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Description of the polyglobule

The present propagation chamber is referred as polyglobule as it covers and allows a number of cutting to sprout. The polyglobule is essentially consists of two regions (A and B). The top triangular metal chamber and the bottom sink area as shown in the figure. The frame of the polyglobule (Part A) fabricated by using iron rods (0.6 cm) with following dimensions: 1.5 m length, 1 m width, 1 m height and the top portion will be slope.

The sink area (Part B) forms the bottom of the polyglobule a pit is dug on compact soil up to 30 cm (12inches) depth and 1.5 m length and 1 m width; and the bottom is covered with polythene cover (400 gauge). The bottom of the pit is filled with 6 to 8 cm metal. The next layer is filled with 3 to 4 cm metal. The top layer consists of two sub-layer. The lower one is filled with coarse sand while the top layer is filled with fine sieved sand. The hormone treated cuttings were placed in the vermiculate filled root trainers which were placed on the sand bed and the frame of the polyglobule is firmly placed into the sink bed.

The bottom polythene sheet of the bed prevents and seepage of water and hence it results in development of humidity. In the ground structure in summer it requires two time watering but in winter it requires water for every two days. These arrangements give an added advantage to the polyglobule in providing high humidity for sprouting.

Cutting of single/double nodes with one pair of leaves from clonal multiplication areas (CMAs), the leaves are cut in to also have to avoid the transpiration. The cuttings are treated with fungicide (Rhidomil 2.5 g/1 lit. of water of Bavistin 1gm/1 lit. of water). Further the fungicide treated cutting will be dipped in rooting hormone IBA (Indole 3 butyric acid) diluted with talcum powder before transferring to vermiculate field root trainers. After planting operation the polyglobule frame is fixed and covered with silpauline sheet. Silpauline cover should be white so to pass the sunlight and excess humidity water droplets passes through the slop of the cover from the top portion without damaging the hormone treated cuttings.

Maintenance in the polyglobule

The manual misting through foot sprayer gives to maintain the

film of water on the cuttings to reduce water loss from the leaves. The temperature should be maintained at 35 to 40°C, if the temperature is more than 40°C open the window cover for 2 to 3 min then the temperature will come down 35°C. The humidity should be 70 to 80 ± 5%. The root initiation starts form the hormone embedded end of the cutting form 10 to 15 days. The shoot length reaches up to 3-5 cm in the length in polyglobule. The fungicides like Rhidomil, tilt, bavistin are sprayed at weekly intervals up to 40 days to avoid the fungal infections. These rooted and sprouted root trainers will be shifted into root trainers stand for acclimatization and placed in hardening chamber up to 10-15 days. These stands can be shifted after 2 weeks into open nursery. In the open nursery the plants 15 to 20cm excluding the height the root trainer is achieved from 60 to 70 days growth. The fungicide sprays are continued outside nursery also at weekly intervals. The dead and decay leaves should remove everyday in the polyglobule and outside nursery.

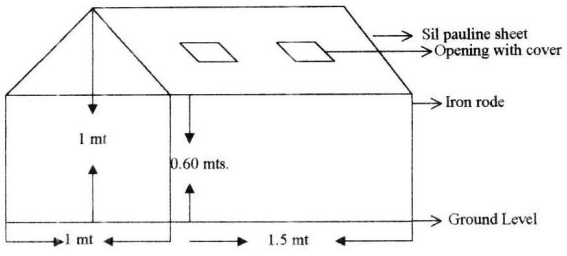
RESULTS AND DISCUSSION

Table 1. Effect of different propagation chambers on rooting percentage of *Eucalyptus*

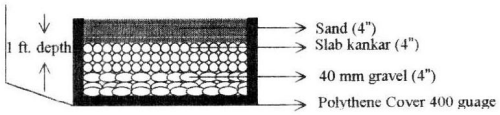
Types of chambers	Hormone con. in ppm	Rooted/survival percentage
Automatic mist chamber	4000	90
Low cost mist chamber	4000	90
Polyglobule	4000	90

Data presented in the table-1 shows that, the percentage of survival and rooting in polyglobule developed by us is similar with the other two propagation chambers. Further the polyglobule has the advantage of creating high humidity without any sophisticated humidifying system with nozzles, pads are humidifiers.

Structure of the Polyglobule:



Below the ground Level Part A



Part B

The total cost of the polyglobule is Rs. 1500=00 (Fifteen hundred Rupees) and accommodates of 750 to 800 number of 100cc root trainers.

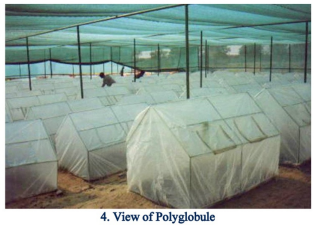
1. Cost of the fabrication charges Rs. 400=00
2. Cost of silpauline sheet Rs. 400=00
3. Cost of digging pit, filling material cost and ground cover charges etc. Rs. 800=00

Total Rs. 1600=00

1. Arranging of root trainers in the Polyglobule

2. Planting of leafy cuttings in nthe root trainers

3. Covering the Polyglobule with stiched silpauline sheet



4. View of Polyglobule

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