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Research Article

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Study on Continuous Harvesting of Eucalyptus Tereticornis in Clonal Multiplication area for Routing of Leafy Cuttings

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ABSTRACT

Clonal Multiplication of Eucalyptus tereticonis through continuous harvest for rooting of leafy cuttings were standardized in this experiment. Maximum number of rooted and sprouted cuttings was obtained in 2nd harvest. The rooting and sprouting was better up to 5th harvest and therefore it is recommended that to take rooting of leafy cuttings up to 5th harvest.

Keywords: *Clonal Multiplication, Eucalyptus tereticonis, leafy cuttings.*

INTRODUCTION

Macro-propagation from stem cuttings and micro-propagation from aseptically germinated seedlings offer several advantages over traditional nursery propagation from seed under favorable conditions (for suitable species). It is a valuable shortcut to genetic gain in breeding programmes and plantations can increases the productivity homogenetically using of clonal plants is also having an advantage when seed is difficult to handle or short lived.

Clonal selection and vegetative propagation through rooting of leafy cuttings in eucalyptus offer a means of great potential for commercial plantings in India. This is already well developed in countries like Brazil Portugal and South Africa. The rooting responses or easy rootability is one of the important characters which determine the final selection of plant material for large scale multiplication programme. Developing roots in stem cuttings is comparatively easy in juvenile plant material than in mature stem cuttings[4]. A good rooting ability of stem cuttings derived from the basal zone has been attributed to an accumulation of natural auxins or other growth promoters[3]. Basal cuttings (up to 30 cm dia.) from 1 year old *Eucalyptus comaldulensis* showed more than 60% success in rooting[2]. Bhatnagar and Joshi[1] reported 60% success in developing roots from 2 year old basal cuttings of *E. tereticornis* (Mysore gum) after hormone treatment. Higher frequency of rooting has been achieved in hygienic environment and absence of water stress by misting[6].

At present clonal forestry in Eucalyptus is well recognized but yet suffers from some of the operational problems like harvesting rotation of the Clonal Multiplication Areas (CMA) and likewise. In the present study the number of harvests of juvenile coppice shoots from *E. tereticornis* Clonal Multiplication Areas is standardized and presented in this paper.

MATERIALS AND METHODS

Study area: The study was carried out at forest research station Mulugu of Hyderabad Andhra Pradesh. The area lies in latitude of 17^0N to 42^0C. Soils are deep at places and from loamy sand to loam and red soils. The vegetation type is dry deciduous miscellaneous scrub forest. The naturally existing species are attaining standard growth in these soils.

Identification of best suited 10 clones from currently available list based on the test results of Research station Mulugu and plantations of APFDC and ITC Badhrachalam are taken up. The Clonal Multiplication Areas of 20. No remets was established in three phases with the espacement of 1 X 1 Mt.

in 2 Ha. area. The area was cleaned, ripped and deeply ploughed repeatedly to eliminate unwanted growth, and leveled, the ground and made the sectors for clear identification of clones and demarcation and planted the clonal seedlings with sufficient care and fertilizer application. Regular watering has been carried out to obtain speedy and healthy multiplication area.

After sufficient establishment of stock plants, the clone number 10 plants were made into stumps for the first time at 10 to 12 cm above the ground level. Sprouting started after 6 to 8 days and the flexible juvenile shoots were taken at the age of 45 to 60 days. Harvested the young mature coppice shoots for rooting of leafy cuttings and removed the balance coppice shoots by clearing the whole stump with and keeping the reading short. If the leading shoot is allowed to grow, it will reduces the production the healthy coppice shoots which are useful for the next Harvest, the coppice shoots here regularly and continuously harvested by maintaining a gap of 45 days between the harvests. The harvested juvenile shoots consisting one or two nodal cuttings (6 to 8 cm length with slant cut at top and bottom) were selected and leaves were trimmed in to half to reduce transpiration loss. These cuttings were treated with fungicide (Ridonil 2 g/ L) for 2 to 3 minutes, and bottom portion of the cutting was treated with rooting harmone indole 3 Butyric Acid (IBA) with talcum powder at 4,000 ppm. The treated cuttings were transferred to root trainers (100cc) containing Vermiculate and shifted to propagation units. In the propagation units (Mist Chambers and polyglobules). The temperature of 35^0C to 40^0C and humidity between 80 to 90 was maintained. Misting was done as and where requires to maintain a thin film of moisture on the leaves of the cuttings. After 10 to 15 days rooting and sprouting started in the propagation units. Inside the propagation units fungicide is sprayed to avoid the fungal infections for every 7^{th} days. Exhaust will be on every morning (about 15 to 20 minutes) to flush out the gases formed inside the propagation units. Complete rooted and sprouted cuttings were shifted into hardening chamber after 30 days for acclimatization.

Precautions:

The plants should be kept under double net for 7 days if the temperature is more. Subsequently they were transferred to single net for 7 days before shifting into open nursery. One granule of DAP (or) diluted Hoagland solution was given to the plants for better growth of nursery.

RESULTS AND DISCUSSION

The table-1 shows 90% rooting percentage in the first three harvest while it was declined from the fourth harvest onwards. The rooting percentage reduced to 66% and 59% in the 4^{th} and 5^{th} harvests respectively. Percentage fall in rooting reached to 50% of the First harvest by 6^{th} harvest. The maximum number of cuttings per plant was recorded in the 2^{nd} harvest. However there is no significant difference in number of cuttings per plant in first three harvest which was reduced from harvest to harvest subsequently (Table-1) similar trend was observed with leafy cuttings also. From 6^{th} harvest also the number of plants tried for vegetative propagation was reduced from 210 to 200, 184 and 175. It clearly shows that due to continuous harvest some of the stumps were dried.

Table 1: Percentage of roots and sprouts at different harvestings

S. No.	No. of Harvest	Percentage of roots & sprouts
1.	Toping	-
2.	First harvest	86
3.	2^{nd} harvest	90
4.	3^{rd} harvest	90
5.	4^{th} harvest	49
6.	5^{th} harvest	45
7.	6^{th} harvest	42
8.	7^{th} harvest	37
9.	8^{th} harvest	32

Maximum number of rooted and sprouted cuttings was observed from 2nd harvest indicating the send harvest as the bet for all the parameters. Good percentage of rooting and sprouting was observed in the 2nd harvest.

As the rooting and sprouting percentage was good and the stumps resistance was better up to 5th harvest. We can obtain 142 leafy cuttings.

Therefore, based on the results of this study we conclude that continuous harvest upto 5th harvest is advisable and same. This method has an added advantage when compared to the general practice of harvesting coppice shoots from only the first harvest as it reduces the maintenance cost of the Clonal Multiplication Areas and getting more number of coppice from the stump.

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