RESEARCH PAPER

Botany_



ABSTRACT The study reveal that the sprouting takes place at both 18 and 24 months Eucalyptus CMA. Further sprouting and rooting percentage at this stage also the same with variation there of 1% for it is suggested that 18 month age group CMA is ideal for clonal propagation.

Introduction

Use of rooted cuttings in propagation of forest trees is an age old technique with species like Populus and Salix. However, Eucalyptus used to be raised from seedlings before it was shifted to clonal propagation through rooted cuttings. The success was marginal in early days due to several operational hindrances such as age of clonal multiplication area (CMA), type of cuttings to root, the best rooting medium, moisture distribution while rooting, required shade, time to sprout, plantation and others. Even today many foresters are suspicious of this "new method" and are reluctant to try; clonal forestry may have been discouraged because they found that each organization, research stations etc. have to develop methodologies to fit their own unique situations and there is no standard Universal best method (Zobel, 1993). Developing roots in stem cuttings is comparatively easy in juvenile plant material than in mature stem cuttings (Hartney, 1980). The rejuvenated rooted cuttings maintain vigour along with genetic superiority of selected trees. This gives better yield in terms of wood volume production, the concept of which has already been utilized for plantation forestry (Compinhos and Ikemori, 1983).

At present, clonal forestry in Eucalyptus is well recognized but yet suffers from some of the operational problems like age of the CMA and likewise. In the present study, age of the Eucalyptus tereticornis CMA is standardized and presented in this paper.

Material and Methods Study Area

The study was carried out in forest research station Mulugu. Hyderabad, Andhra Pradesh. The area lines in latitude of 17° N- 18° N and longitudes of 78° 30 East. The average rainfall of the area is less than 800 mm. Temperature ranges from 18° C to 42° C. Soils are deep at places and varies from loamy stand 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.

This experiment was conducted during 1996 to 1999 in Eucalyptus tereticornis clonal multiplication area of 0.5 ha of (10) different clones, in each clone (500) ramets; supplied by ITC Badhrachalam. This CMA was maintained through intensive management by giving farmyard manure and regular irrigation. Vegetative propagation using the above Eucalyptus CMA was tried in 4 different age groups (6 months, 12, 18 and 24 months) for standardization of the age of CMA to fell and to obtain the coppice shoots. At each stage 100 plants because the coppice will be in proper state to make cuttings during January-February for the first harvest and during February-March for the second harvest as it is the proper time to developed rooted cuttings at planting time (June-July). The coppiced stumps were treated with anti-fungal and anti-termite solutions on the cut portion of the stump. No irrigation was be given up to 5 to 6 days. After 6 days the manure and irrigation was given to get more number of coppice shoots. Irrigation was continuous up to 45 to 60 days support juvenile shoots to should be flexible. Coppice shoots were harvested and kept in water container with polythene sheet. The shoots from base to top were selected and used. The one or two nodal cutting (6 to 8 cm length with slant cut to top and bottom portion) were selected and leaves were trimmed in to half to reduce transpiration loss. These cuttings were treated with fungicide (Ridomil 2 g/l. or Bavistin g/ $\tilde{I})$ for 2 to 3 minute and bottom portion of the cutting was treated with rooting hormone Indole three Butyric acid (IBA) with talcum powder at 6,000 ppm. The treated cuttings were transferred to root trainer (100 cc) containing vermiculite and shifted in to propagation Units. In the propagation units, the temperature of 35° to 40° and humidity between 80 to 90% was maintained. Misting was be done to maintain a thin film of moisture on the leaves of the cuttings. After 10 to 15 days rooting and sprouting starts in the propagation units. Inside the propagation units fungicide is sprayed to avoid the fungal infections at every 7th day. 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 in to hardening chamber after 30 days for acclimatization.

Precautions:

(Table 1)

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

Results and discussion:

(a) In 6 months old Eucalyptus Clonal Multiplication Area The 6 months old stumps recorded girth of 5 cm and no juvenile shoots were grown. All the stumps died at this stage.

(b) In 12 months old Eucalyptus Clonal Multiplication Area

12 months Old stumps attained girth of 11cm. good sprouting was recorded. With overage coppice shoots per stump were 14. The sprouting was started from 6th day onwards. The coppice shoots achieved pencil thickness and were flexible at the age of 45 to 60 days. Sprouting and rooting was started from 10 to 15 days onwards in the propagation units. The rooting and sprouting percentage was 30. (Table 1)

(c) In 18 months old Eucalyptus Clonal Multiplication Area

The 18 months stump showed an average girth 20 cm. and gave good sprouts with 22 coppice for stump on an average. The coppice shoots gained pencil thickness and were flexible in 45 to 60 days period. Rooting and sprouting started from

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10 to 15 days onwards in the propagation units. The average sprouting and rooting percentage was 59%. (Table 1)

24 months old Eucalyptus Clonal Multiplication (d) In Area

At this stage average stump girth was 23 cm. and with good sprouting, sprouting average was 22 coppices for stump. The coppice shoots formed pencil thickness, flexible juvenile shoots in 45 to 60 days period. Rooting and sprouting started from 10 to 15 days onwards in the propagation units. The average sprouting and rooting percentage was 60%. (Table 1)

Results of this study reveal that the sprouting takes place at both 18 and 24 months Eucalyptus CMA. Further sprouting and rooting percentage at this stage also the same with variation there of 1% for it is suggested that 18 month age group CMA is ideal for clonal propagation. It not only reduces the time by six months but also give the benefit of avoiding expenditure for another six months maintenance. Therefore we recommend 18 months old CMA as the ideal stage for selecting CMA.

Table No. 1: Percentage of different age group stump sprouts by using leafy cutting of Eucalyptus teretecornis from Clonal Multiplication Areas (CMA)

S. No.	Age of the CMA in months	No. of Plants felled	Average girth of the stumps in cm.	Average no. of Juvenile shoots per stump.	Average no. of cuttings per stump.	Hormone treatment in ppm	Average no. of leaty cut- tings tried.	Average no. of rooted cuttings	Percentage of the rooted cut- tings. (%)
1	6	100	5	-	-	-	-	-	-
2	12	100	11	14	42	6,000	4,200	1,260	30
3	18	100	20	22	66	6,000	6,600	3,960	59
4	24	100	23	22	66	6,000	6,600	3,960	60



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