



Growth Performance of Different Clones of *Eucalyptus tereticornis* under Dryland Conditions in Vidarbha Region, Maharashtra

VM Ilorkar, PH Kausadikar, YR Khobragade

AICRP on Agroforestry, PDKV College of Agriculture, Nagpur
Email : ilorkar@yahoo.co.in

ABSTRACT

Eucalyptus tereticornis clones cultivated on shallow medium soil under dry land conditions were evaluated for five years and compared with the seedling growth. Among the clones ITC – 413 attained maximum and significant height (6.62 m) followed by ITC – 71 (6.33 m) and ITC – 316 (6.32 m). ITC -413 and ITC – 71 were at par while the lowest height was recorded by ITC – 136 (5.26 m). Maximum mean annual height increment (MAI) was observed in ITC - 413 (1.324 m). With reference to diameter at breast height (DBH) maximum DBH was attained by ITC – 413 (20.13 cm) followed by ITC - 316 (16.32 cm) and ITC – 71 (15.23 cm). The lowest DBH was attained in ITC – 286 (7.12 cm). Maximum mean annual DBH (MAI) was produced by ITC – 413 (4.026 cm). *Eucalyptus* clones ITC – 413, ITC – 316 and ITC – 71 suggest their suitability for cultivation under local dry land conditions.

Keywords:

Diameter, height, Eucalyptus tereticornis, increment

INTRODUCTION

Demand of wood from forest or commercial plantations for timber, fuelwood, pulp and paper production is increasing each year in a rapid way. Productivity of our forests is even much lower at less than 1 m³ per ha / year due to low quality planting material, and hence India is a wood deficit and need import huge volume of timber and wood based products every year to bridge the demand supply gap. Our country pays extremely high price because of such neglect of quality of seedlings and resultant loss of productivity and poor quality of timber. (Dhyani and Handa 2014; Tumbull 1999)

Eucalyptus is a medium sized to tall fast growing tree and reaches about 25 meters to 50

meters in height and up to 2 meter in diameter. This tree belongs to the family of “*Myrtaceae*” with about 325 species of the genus. *Eucalyptus* is native to Australia, Tasmania and nearby islands. This tree is also called as “gum tree”, “re iron tree”, “safeda or nilgiri”. *Eucalyptus grandis* and *E. tereticornis* are the main commercial species (Dwivedi 2004)

Vegetative propagated saplings developed from a single superior tree with most desirable qualities along with the ortet constitute a clone (Kulkarni 2014; Gomes and Corria 1995). Therefore, clonal saplings of each clone are uniform and true to type with all the genetic qualities of the mother tree. Each clone represents a particular genotype and the genetic

traits differ from clone to clone. All tree species amenable to cost effective vegetative propagation can be cloned for development and deployment of genetically superior clonal planting stock for reforestation and agroforestry projects (Lal 2005). Genetically superior clonal planting stock offers many distinct advantages compared to seedlings obtained from normal seed such as it has all desirable genetic qualities of the mother plant, immediate capture of genetic gains to exploit natural variation or hybrid vigour through cloning is possible, very high productivity and far better quality of timber and pulpwood from clonal plantations compared to normal seed based plantations. Hence the research was undertaken to evaluate different clones of eucalyptus under dry land conditions.

MATERIAL AND METHODS

The present experiment was conducted to access the growth of different clones of eucalyptus under dry land conditions at Agroforestry Research Farm (Futala farm), College of Agriculture, Nagpur during year 2011 to 2015. Nagpur lies between 21.145 N latitude and 79.09 E longitudes. Nagpur has tropical wet and dry climate (Köppen climate classification) with dry conditions prevailing for most of the year. It receives an annual rainfall of 1205 mm (47.44 inches) from monsoon rains during June to September. The experiment consists of 10 clones of *Eucalyptus tereticornis* which were replicated thrice. The treatments consist of nine clones viz., ITC -7, ITC -413, ITC -316, ITC-71, ITC-526, ITC-288, ITC-136, ITC-286 and ITC-3 which were compared with seedling as check. Each treatment consists of 9 trees. The seedlings were planted at 2m X 2m spacing. Protective irrigation was provided during first year only. Intercultural operations weeding and soil working were carried out to keep the experimental plot clean. Measurements were recorded following standard mensuration practices (Chaturvedi and Khanna 1982)

RESULTS AND DISCUSSION

Height of eucalyptus clones varied significantly among different Eucalyptus clones.

The maximum height during 2011-12 and 2012-13 was observed in ITC – 71 (0.58 m and 2.16 m), while ITC – 413 recorded maximum height (5.62 m and 6.62 n) during 2014-15. Large variation was observed in the height of all clones per year. In terms of annual increase in height of clones ITC – 413 and ITC – 71 performed well by attaining maximum during experimental period. Lowest height was observed in seedling treatment in the beginning of experiment while ITC – 3 recorded lowest height in the final year 2014-15 (3.27 m). Mean annual increment in height was also significantly higher ITC -413 followed by ITC – 71. (Table 1)

Table 1. Height (meter) of different eucalyptus clones

Sr. No	Clone	2012	2013	2014	2015	MAI
1	ITC - 7	0.43	1.35	4.80	5.87	1.17
2	ITC - 413	0.50	2.10	5.62	6.62	1.32
3	ITC - 316	0.56	1.91	5.41	6.32	1.26
4	ITC - 71	0.58	2.16	5.21	6.33	1.2
5	ITC - 526	0.43	1.49	4.94	5.98	1.20
6	ITC - 288	0.40	1.12	3.78	4.67	0.93
7	ITC - 136	0.41	0.87	4.16	5.26	1.05
8	ITC - 286	0.42	0.80	2.36	3.27	0.65
9	ITC - 286	0.59	1.16	3.53	4.54	0.9
10	Seedling	0.35	1.03	2.47	3.52	0.70
	SE	0.04	0.12	0.59	0.61	
	CD (0.05)	0.14	0.36	1.75	0.18	

The data regarding diameter at breast height reveal that clones had shown significant variation in the diameter (Table 2). Among all the treatments clone ITC – 413 and ITC 316 had shown significant increment in the diameter of a tree during years 2012-13, 2013-14 and 2014-15 respectively followed by ITC – 316. The lowest increase in the diameter of eucalyptus was recorded in ITC – 136 and ITC – 286 for complete study period. Similar results were reported by Patil et al. (2012) while working with different species of eucalyptus under waste land conditions. Mean annual increment in terms of diameter at breast height was significantly higher in ITC -413 (4.03) followed by ITC – 71 (3.26)..

Table 2. Diameter at breast height (centimeter) of different eucalyptus clones

Sr. No	Clone	2012*	2013*	2014	2015	MAI
1	ITC - 7	5.7	9.37	9.61	10.71	2.14
2	ITC - 413	6.4	11.33	15.05	20.13	4.0 3
3	ITC - 316	6.9	11.13	14.00	16.32	3.26
4	ITC - 71	7.1	10.83	13.58	15.23	3.0 5
5	ITC - 526	7.0	10.13	9.63	11.32	2.26
6	ITC - 288	5.9	6.97	8.93	10.25	2.05
7	ITC - 136	5.3	6.90	5.16	7.23	1.4 5
8	ITC - 286	4.9	4.30	5.53	7.12	1.42
9	ITC - 3	5.4	7.00	5.9	7.52	1.50
10	Seedling	5.1	4.67	8.07	10.2	2.04
	SE	0.6	1.37	0.7	0.8	
	CD	NS	4.09	NS	0.24	

*Indicates collar diameter.

Among different eucalyptus clones maximum variation was observed in ITC - 413 followed by ITC - 71 for height and diameter at breast height under this study. Results are in confirmation with Kumar and Bangawa (2006), Chandra and Yadav (1986), Kumar et al. (2010).

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