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RESPONSE OF *EUCALYPTUS CAMALDULENSIS* SEED TO DIFFERENT SOWING MEDIA AND WATER REGIME

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Abstract

Study on response of Eucalyptus camaldulensis seeds to different sowing media and water regime was assessed at the Screenhouse of Crop Production Technology Department, Oyo State College of Agriculture and Technology Igboora, Nigeria. The design was a 4 x 5 factorial experiment fitted into Completely Randomized Design involving four sowing media (Topsoil, Sawdust, River sand and Clay soil) as the main plot and Five water regimes (daily, 3, 7, 14 and 30 days) as the sub-plot. Data collected on Days to first germination, Germination count and Percentage germination for 16 weeks were subjected to analysis of variance (ANOVA) and the means were separated using Least significant difference (LSD) at 5%. The result revealed that Eucalyptus camaldulensis seeds significantly responded well to top soil when compared to the rest of the sowing media as well as daily watering when compared to other water regimes. There was no significant difference in the treatment combination of sowing media and water regime. It was therefore concluded and recommended that top soil with daily watering should be considered for fast germination of Eucalyptus camaldulensis.

Keywords: Sowing media, Water Regime, *Eucalyptus camaldulensis*.

Introduction

Eucalyptus camaldulensis is the most widely distributed of all eucalypts. Globally, *Eucalyptus camaldulensis* is perhaps the most widely used tree for planting in arid and semi-arid lands (Eldridge *et al.*, 1993). *E. camaldulensis* is a riverine species and it occurs occasionally in open forest or woodland formations on floodplains.

E. camaldulensis is planted extensively for shade, shelter and serenity purposes. It is commonly used in shelter belts adjacent to crops where it offers protection from desiccating winds (Onyewotu and Stiger, 1995). It is useful for reclaiming degraded land, especially mine spoils and salt-affected land subject to seasonal waterlogging, and particularly when the salinity is moderate or low (Farrel *et al.*, 1996).

The timber has a handsome red color, fine texture and interlocking wavy grain. It is hard, durable, and resistant to termites and has many uses (Kaeting and Bolza, 1992). Correctly handled, the wood is useful in the production of specialty furniture, construction timber, pulpwood, round wood and fuel wood (Ponyton, 1979). It burns well and can be used for making charcoal for iron and steel industries as used in Brazil (Eldridge *et al.*, 1993).

In summary, the contribution of *Eucalyptus camaldulensis* cannot be over emphasized when considering the role it plays in any nation and the world at large. Like many other ornamental trees, *Eucalyptus camaldulensis* is important in controlling wind erosion, desertification, provision of shade and other ecological purposes. Looking at the vast importance of *Eucalyptus camaldulensis* which is beyond what other ornamental trees can do, studies should be done to make sure it can survive on any soil condition at different water level, it should be raised globally.

Materials and methods

The experiment was carried out at the screen house of the Department of Crop Production Technology, Oyo State College of Agriculture and Technology Igboora (Latitude 7° 15'N Longitude 3° 03'E), Nigeria between July, 2019 and December, 2019. The seeds of *E. camaldulensis* sourced from the Department of Forestry Technology, Oyo

State College of Agriculture and Technology, Igboora were soaked overnight to hasten the germination process before broadcasting into four (4) germination boxes filled with different sowing media (Topsoil, Saw dust, River sand and clay soil) as main plot, to be watered at five (5) different water regimes to field capacity (daily, 3 days interval, 7 days interval, 14 days interval and 30 days interval) as sub plot and stored under room temperature to speed up the germination of the seeds.

The experimental design was 4 x 5 factorial experiments in Completely Randomized Design (CRD). Data collected on Days to first germination, Germination count and Percentage germination for 16 weeks were subjected to analysis of variance (ANOVA) using Gensat discovery edition 4 and the separation of means were done with the use of Least significant difference (LSD) at 5%.

Results and discussion

E. camaldulensis seeds planted on top soil significantly ($P>0.05$) had the fastest days to germination (7.3) when compared to *E. camaldulensis* planted on sawdust (16.0), River sand (18.3) and clay soil (27.1). *E. camaldulensis* seeds planted on top soil also significantly ($P>0.05$) had the highest germination rate and percentage {2.93 (14.67%)} when compared to *E. camaldulensis* planted on sawdust {1.13 (5.67%)}, River sand {1.07 (5.33%)} and clay soil which gave the least germination rate {0.73 (3.67%)} irrespective of the water regime.

Watering improves the days to first germination positively where seedlings watered daily and 3 days had significantly ($P>0.05$) fastest days to germination value (14.8) when compared to seeds watered at 7 days interval (17.8), 14 days interval (18.2) and 30 days interval (20.4) which had the slowest days to germination value irrespective of the soil type. Watering plays a positive role in the germination of *E. camaldulensis* where seedlings watered daily has the highest germination rate and percentage {1.75 (8.75%)} when compared to those watered at 3 days {1.42 (7.08%)}, 7 days {1.42 (7.08%)}, 14 days {1.33 (6.67%)} and 30 days interval {1.33 (6.67%)} irrespective of the soil type.

The above findings had strong agreement with the statement by Fatima and Muna (2013) that survival of seedling is strongly affected by water availability and soil type, it is evident that *Eucalyptus camaldulensis* seed will not germinate at optimum without adequate watering and soil type. Daily watering was effective in the germination of *E. camaldulensis* which had been said to be a water loving plant. This research showed that not just the seedlings or matured *E. camaldulensis* require high moisture but as well as seed. This result corroborated the result of Henderson (2001) which stated that *E. camaldulensis* is a riverine species and a water loving plant. *E. camaldulensis* seeds responded best to top soil therefore revealing that it requires a medium with optimum water holding capacity and temperature. This is in support with the research by Orwa *et al.* (2009) who got similar result.

Table 1: Days to First Germination (DFG), Growth Rate (GR) and Percentage Germination (%G) response of *Eucalyptus camaldulensis* seed

TREATMENT	DFG	GR	%G
SOWING MEDIA (SM)			
Top soil	7.3	2.93	14.67
River sand	18.3	1.07	5.33
Sawdust	16.0	1.13	5.67
Clay soil	27.1	0.73	3.67
LSD (0.05)	10.17	1.127	5.637
WATER REGIME (WR)			
Daily	14.8	1.75	8.75

3 Days	14.8	1.42	7.08
7 Days	17.2	1.42	7.08
14 Days	18.7	1.33	6.67
30 Days	20.4	1.33	6.67
LSD	1.932	NS	NS
INTERACTION			
SM x WR	NS	NS	NS

NS: Not Significant

Conclusion and recommendation

The result of the study had shown that top soil is the best soil type for the germination of *Eucalyptus camaldulensis* irrespective of the draught stress while watering daily of *Eucalyptus camaldulensis* had the best watering regime. It is therefore recommended that daily watering and top soil should be employed in the raising of *Eucalyptus camaldulensis* seedlings as it is best treatment with the fastest germination rate.

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