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Evaluation of Root Distribution in different Clones of Eucalyptus Tereticornis and Eucalyptus Camaldulensis

Romeet Saha[1] and Santan Barthwal[2]

[1,2]Genetics and Tree Propagation Division, Forest Research Institute, Dehradun

Abstract—*The spatial arrangement of root system determines the plant's ability to counteract localized depletion of nutrients. It is widely accepted that vertical distribution of nutrients according to depth is in the order: P > K > Ca > Mg > Na = Cl = SO4. Nutrients which are rapidly cycled by plants are usually concentrated on top layers of the soil while the rest are leeched down. Root distribution can be linked with the plant's ability to acquire water and nutrients. Eucalypts being a commercially important species was the focus of this study. Four different clones were purchased from Pragati Biotechnologies (Clone no. 01, 72, 288, and 411) of Eucalyptus tereticornis and E. camaldulensis. The experiment was conducted in the nursery of Genetics and Tree Propagation Division, FRI, Dehradun. Profile Wall method was used to analyze root distribution of each clone after 6, 12 and 18 months of growth where a trench was dug and root distribution was studied in the exposed soil profile using a grid (1*1 m). Clone 1 and 72 showed highest penetration at 12 and 18 months interval. Clones 01, 72 and 288 showed rapid horizontal growth and clone 411 showed least amount of spread till the first 12 months but it was seen to be significantly higher in all clones after 18 months. Clone 01, 72 having high geotropic penetration can be planted in areas with low rainfall and also be coupled with agricultural crops whose roots dominate the topsoil thereby ensuring less competition for nutrients. After 18 months clone 288 and 411 showed high horizontal spread which might make them useful in areas susceptible to erosion. Further study along this line would shed light on how we can apply the pattern of root distribution to make proper utilization of different clones in different environmental conditions.*