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RESEARCH ARTICLE

Carbon sequestration potential of subabul (*Leucaena leucocephala*) genotypes for shallow vertisols of northern dry zone of Karnataka

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SUMMARY

A field experiment was carried out at Regional Agricultural Research Station, Bijapur (Karnataka) during 1999 to 2010 to evaluate the carbon sequestration potentials of subabul *(Leucaena leucocephala)* genotypes under shallow vertisols of northern dry zone of Karnataka. Results of the study indicated that, among eight subabul genotypes, the total biomass production was highest in S-10 (59.22 t ha^{-1}, 80.39 t ha^{-1}, 106.08 t ha^{-1} and 125.93 t ha^{-1}, respectively during 8^{th}, 9^{th}, 10^{th} and 11^{th} year of planting with an carbon sequestration potential of (29.61 t ha^{-1}, 40.19 t ha^{-1}, 53.04 t ha^{-1} and 62.97 t ha^{-1}, respectively during 8^{th}, 9^{th}, 10^{th} and 11^{th} year of planting) followed by K-636 and S-24. Hence, considering all these parameters, it may be inferred that Leucaena genotype, S-10, is the most promising to grow in shallow black soils of northern dry zone of Karnataka under rain fed situation (annual rainfall 594 mm) with higher potentials of carbon trading.

Key Words : Carbon sequestration, Subabul genotypes, Vertisols, Biomass

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There are ten agro-climatic zones in Karnataka, out of which five are classified as dry zones. Northern dry zone is the largest of all the zones in the state of Karnataka and second largest zone in the country which occupies an area of 4.19 million hectares (m ha) and out of which only 6.6 per cent is under forests and rest of the area is under arable crops or fallow. The dryland ecosystems of north Karnataka lie in typical semiarid environment with an annual rainfall of 594 mm occurring in 39 rainy days which is highly erratic and ill distributed resulting in frequent droughts. The track consists of vertisols to the tune of 80 per cent which are further classified as deep soils, medium deep and shallow soils. The unscientific management of soil resources and uneven nature of the terrain have lead to conversion of the shallow soils in to denuded soils which have become either unproductive or under productive. The dryland ecosystems are devoid of required cover of perennial vegetation to maintain ecological balance. All these conditions have aggravated the status of land quality in terms of soil, water and vegetation resources of the tract. Hence, there is urgent need of incorporating the perennial vegetation in shallow soil ecosystems to bring sustainability in terms of ecological conservation and economic returns. Trees included in dry land ecosystems not only conserve the ecology but also adds to farmers economic returns in terms of its tangible benefits. With increasing awareness of carbon trading, it is attracting the researchers, planners and farmers as an important economic source to the farmers in the days to come. Looking to the importance of planting tree species in drier areas with

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