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Interaction between *Dalbergia sissoo* boundary Plantation and Food-fodder Crop Sequence under Rainfed Agro-ecosystem

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Abstract

An investigation was carried out to study the impact of *Dalbergia sissoo* boundary plantation on the soil properties and productivity of sorghum (fodder) - barley (grain) crop sequence under rainfed condition in semi-arid region of India. The soil moisture content up to 60 cm soil depth in *rabi* (dry & winter) season was found to increase with the increase in distance from the tree-line and it was greater on the northern side than on southern side. A decreasing trend was observed for organic carbon and available N, P and K content in the surface soil (01–15 cm) with increasing distance from the tree base. The green fodder yield of sorghum in *Kharif* (rainy) season was significantly reduced up to 5 m and 3m distances on the northern and southern sides of the boundary plantation, respectively. Average reduction in fodder production in association with *Dalbergia sissoo* trees was 23.0% on northern side and 15.6% on southern side of the tree line. Tree shading was responsible for reduction in yield of sorghum. Intercropping of barley with trees in *rabi* season caused 23.2% and 18.5% decrease in average grain yield in the northern and southern directions, respectively. Competition for growth resources like water and sunlight between trees and barley resulted in decreased grain yield up to 6m on northern and 4m on the southern side of the boundary plantation.

Top

Key words

Dalbergia sissoo boundary plantation, sorghum, barley, tree competition, shade, soil fertility, soil moisture, distance from trees and directions.