Impact of pruning intensity of *Dalbergia sissoo* Roxb and turmeric on Monetary return

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**ABSTRACT**

A field experiment was conducted at the Research Farm, of New Dusty Acre Area, Department of Forestry, College of Agriculture, JNKVV, Jabalpur (M.P.) during, 2015-16. The experiment involves four pruning intensities + open condition (only crop) in main plot and three different dates of planting in sub plot under strip plot design with four replications. The results revealed that, 25 per cent pruning recorded higher net monetary return (Rs 94062 ha), as compared to 50 per cent pruning (Rs 82125 ha), over the open condition recorded significantly lowest net monetary return.

**KEYWORDS**

Cost of Cultivation, Gross Monetary Returns, Net Monetary Returns, B: C Ratio

**HOW TO CITE THIS ARTICLE**


Agriculture has been a way of life and continues to be the single most important livelihood of the masses in India. The economic viability of crop production sector, therefore, becomes an essential condition to sustain interests of the farming community. In this context, accurate information on the cost of cultivation (COC) is indispensable. It not only helps the farmers to decide on the allocation of limited resources among alternate crop choices but also enables an assessment of farm profitability, which in turn influences their decision to invest in agriculture. The increased volume of the crop output, which resulted from the intensification of agriculture after the introduction of green revolution during the mid-sixties, has helped to increase the wage rate and generate more employment opportunities in the rural areas particularly for the landless labourers (Saleth, *et al.*, 2003, Narayanamoorthy and Deshpande, 2003). These achievements would not have been possible without the incisive role of Indian farmers (Swaminathan, 2008). Despite these achievements, there is no recent great news from the farm sector since the early 1990s. Farmers’ suicides, indebtedness, crop failures, un-remunerative prices for crops and poor returns over cost of cultivation are the prominent features of India’s agriculture today. Farmers committing suicides were not common before the early 1990s, but it has become a widespread phenomenon today in many states of India. Returns from crop cultivation are essential not only for the survival of the farmers but also to facilitate reinvestment in agriculture. If the flow of income from crop cultivation is not regular and is inadequate, farmers may not be able to repay their debts which would lead to increased indebtedness (NSSO, 2005, Narayanamoorthy and Kalamkar, 2005; Reddy and Mishra, 2009; Deshpande and Arora, 2010).

**Materials and Methods**

A field experiment was conducted at Dusty Acre Area, Department of Forestry, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) during...
2015-16, lies between 22°49’ to 2408’ North Latitude and 78021’ to 80058’ East Longitude with an attitude of 411.78 m MSL. The climate of the region is semi and with hot dry summer and cold dry winter. The soil of the experimental area was medium black, clay loam in texture, neutral in reaction (pH 7.21), medium in organic carbon (0.46%), medium in available nitrogen(207 kg ha⁻¹), medium in available phosphorus (16.26 kg ha⁻¹) and very low in Potash (172 kg ha⁻¹).

The experiment was conducted during rainy season under 16 years old Dalbergia sissoo planted at a distance of (5×5 m²). The experiment involve four pruning intensities viz., no pruning, (25%, 50% and 75%) pruning in Dalbergia sissoo + open condition (only crop) in main plot and three different date of planting 20 June 2015, 27 June 2015 and 03 July 2015 in sub plot under strip plot design with four replications. All the observations were recorded and common package of practices recommended by JNKVV, Jabalpur.

Cost of Cultivation

The cost of cultivation for each treatment was determined on the basis of different inputs used and operations performed for raising the crop in one hectare area under different treatments.

Gross Monetary Returns (GMR)

The values could be realized from the produce obtained under each treatment was computed on the basis of existing market price of the produce. Total values of the produce (rhizomes) were considered as GMR per hectare under different treatments.

Net Monetary Returns (NMR)

After this, NMR per hectare under each treatment was determined by subtracting the cost of cultivation of a particular treatment from the GMR of the same treatments.

Benefit: Cost Ratio (B: C Ratio)

To estimate the benefits obtained from different treatment for each rupee of expenditure incurred. The B: C ratio of each treatment was calculated as below:

\[
B: C \text{ ratio} = \frac{\text{GMR per hectare}}{\text{Cost of cultivation per hectare}}
\]

Results and Discussion

Gross Monetary Return

The gross monetary return of treatment was determined by subtracting the cost of cultivation of particular treatment. Different pruning intensities showed significant effect on monetary return. The 25 per cent pruning recorded significantly gross monetary return (Rs 164062 ha) which was at par with 50 per cent pruning (Rs 152124.66 ha) but significantly superior to 75 per cent pruning (Rs 145624.66 ha) and no pruning (Rs 130937.33 ha). Only crop recorded the lowest gross monetary return (Rs 125312.33 ha).

Different date of sowing showed significant effect Gross monetary return. First date of sowing recorded highest gross monetary return (Rs 173437.2 ha) and second date of sowing recorded (Rs 155399.8 ha) and third date of sowing recorded the lowest gross monetary return (Rs 101999.6 ha). Under Managed agro-forestry system i.e. turmeric with 25 per cent pruning recorded Gross monetary return (Rs ha) as compared to only crop (Rs 55312 ha).

The probable reason of higher return under 25 per cent pruning is due to higher average return from tree biomass and crop biomass as compared to other treatments i.e. in 75 per cent pruning, higher return from crop but low return from tree. Similarly in 50 per cent pruning more return obtained from tree but less return from crop. The probable reason of higher Gross monetary return in managed agro-forestry system, in that sufficient Gross monetary return obtained from both tree and crop component whereas, only crop, return obtained from only one component either only crop.

Net Monetary Return

The net monetary return (NMR) of treatment was determined by subtracting the cost of cultivation from GMR of particular treatment. Different pruning intensities showed significant effect on monetary return. The 25% pruning recorded significantly higher monetary return (Rs 94062 ha) which was at par with 50% pruning (Rs 82125 ha) but significantly superior to 75% pruning (Rs 75625 ha) and no pruning (Rs 60937 ha). Only crop recorded the lowest monetary return (Rs 55612 ha). Different date of sowing showed significant effect Net monetary return. First date of sowing recorded highest net monetary return (Rs 103437 ha) and second date of sowing recorded net monetary return (Rs 85400 ha) and third date of sowing recorded the lowest net monetary return (Rs 32000 ha). Under managed agro-forestry system i.e. turmeric with 25% pruning recorded higher monetary return (Rs 94062 ha) as compared to only crop (Rs 55312 ha). The probable reason of higher return fewer than 25% pruning is due to higher average return from tree biomass and crop biomass as compared to other treatments i.e. in 75% pruning, higher return from crop.
but low return from tree. Similarly in 50% pruning more return obtained from tree but less return from crop. The probable reason of higher return in managed agro-forestry system, in that sufficient return obtained from both tree and crop component whereas, only crop, return obtained from only one component either only crop.

### Table 1. Net monetary return (Rs/ha) as influenced by different pruning intensities in *D. sissoo* at different dates of planting

<table>
<thead>
<tr>
<th>Pruning Intensities</th>
<th>D1 20/6/2015</th>
<th>D2 27/6/2015</th>
<th>D3 3/7/2015</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0 - No pruning</td>
<td>80000</td>
<td>51875</td>
<td>50937</td>
<td>60937</td>
</tr>
<tr>
<td>P1 - 25% pruning</td>
<td>124062</td>
<td>137187</td>
<td>20937</td>
<td>94062</td>
</tr>
<tr>
<td>P2 - 50% pruning</td>
<td>114687</td>
<td>98562</td>
<td>33125</td>
<td>82125</td>
</tr>
<tr>
<td>P3 - 75% pruning</td>
<td>112812</td>
<td>93125</td>
<td>20937</td>
<td>75625</td>
</tr>
<tr>
<td>P4 - only crop</td>
<td>85625</td>
<td>46250</td>
<td>34062</td>
<td>55312</td>
</tr>
</tbody>
</table>

### Table 2. Economics analysis of different treatments on per hectare area basis

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Treatments</th>
<th>Cost of Cultivation (Rs ha)</th>
<th>Gross Monetary Return (Rs ha)</th>
<th>Net Monetary Return (Rs ha)</th>
<th>Benefit: Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No pruning + D1</td>
<td>70000</td>
<td>150000</td>
<td>80000</td>
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</tr>
<tr>
<td>2</td>
<td>No pruning + D2</td>
<td>70000</td>
<td>121875</td>
<td>51875</td>
<td>1.74</td>
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<tr>
<td>3</td>
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<td>70000</td>
<td>120937</td>
<td>50937</td>
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<td>4</td>
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<td>70000</td>
<td>194062</td>
<td>124062</td>
<td>2.77</td>
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<td>5</td>
<td>25% pruning + D2</td>
<td>70000</td>
<td>207187</td>
<td>137187</td>
<td>2.95</td>
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<td>6</td>
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<td>70000</td>
<td>90937</td>
<td>20937</td>
<td>1.29</td>
</tr>
<tr>
<td>7</td>
<td>50% pruning + D1</td>
<td>70000</td>
<td>184687</td>
<td>114687</td>
<td>2.63</td>
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<tr>
<td>8</td>
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<td>70000</td>
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<td>33125</td>
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<td>112812</td>
<td>2.61</td>
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<td>11</td>
<td>75% pruning + D2</td>
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<td>163125</td>
<td>93125</td>
<td>2.33</td>
</tr>
<tr>
<td>12</td>
<td>75% pruning + D3</td>
<td>70000</td>
<td>90937</td>
<td>20937</td>
<td>1.29</td>
</tr>
<tr>
<td>13</td>
<td>Open crop only D1</td>
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<td>155625</td>
<td>85625</td>
<td>2.22</td>
</tr>
<tr>
<td>14</td>
<td>Open crop only D2</td>
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<td>46250</td>
<td>1.66</td>
</tr>
<tr>
<td>15</td>
<td>Open crop only D3</td>
<td>70000</td>
<td>104062</td>
<td>34062</td>
<td>1.48</td>
</tr>
</tbody>
</table>

Sale rate of turmeric @ Rs.20 kg respectively

**Benefit: Cost Ratio (B: C Ratio)**

It refers to the net monetary gain under a particular treatment with each rupee of investment. The benefit cost ratio indices as affected by different treatment. Benefit cost ratio was significantly affected by different pruning treatment. 25% pruning recorded significantly higher B: C ratio (2.33) but at par with 50% pruning (2.16) and 75% pruning (2.07) and no pruning (1.86) and significantly superior to only crop (1.78). Different date of sowing showed significant effect B: C ratio. First date of sowing recorded highest B: C ratio (Rs 12.37) and second date of sowing recorded B: C ratio (11.08) and third date of sowing recorded the lowest B: C ratio (7.25).

**References**


