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Cost of cultivation of *Ziziphus mauritiana*

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Abstract
Ber orchard growers in the Bikaner district was selected as the sample unit. It was consisted of 100 respondents for the selection of grower convenience sampling was used firstly, selection of villages was done on the basis of list provided by state horticulture department, KVK, CIAH and mandi traders. Then researcher visits the villages from the list provided and on referral basis. The result showed that the total variable cost 60,600 (₹), total fixed cost 92,900 (₹) was spend as accumulated it was 1, 53,500(₹) as the total cost of cultivation for Ber.

Keywords: *Ziziphus mauritiana*, cost of cultivation, ber orchard

Introduction

Ziziphus mauritiana (Zm) is cultivated to some extent throughout its natural range but mostly in India where it is grown commercially and has received much horticultural attention and refinement despite the fact that it frequently escapes and becomes a pest. It was introduced into Guam about 1850 but is not often planted there or in Hawaii except as an ornamental. Specimens are scattered about the drier parts of the West Indies, the Bahamas, Colombia and Venezuela, Guatemala, Belize, and southern Florida.

In Barbados, Jamaica and Puerto Rico the tree is naturalized and forms thickets in uncultivated areas. In 1939, 6 trees from Malaysia were introduced into Israel and flourished there. They bore very light crops of fruit heavily infested with fruit flies and were therefore destroyed to protect other fruit trees. Badari in Sanskrit, many Hindu epic stories e.g Ramayana, tree fails to secure the dress of Sita and after confessing to Rama droops in shame. Biological Source: It consists of dried ripe fruits, leaves, roots and seeds of *Ziziphus mauritiana.*

Methodology

Study the cost of cultivation of *Ziziphus mauritiana*

Primary data was collected from the farmers about their demographic details and their cost of cultivation details regarding ber cultivation were assessed by calculating percentage and frequencies.

$r = (\text{Antilog } \beta_1\text{-}1)100$

Costs structure

Estimation of cost: The cost of cultivation of crop per hectare was computed on the basis of the following cost items.

1. Value human labour
2. Value of fertilizers and pesticides
3. Irrigation charges
4. Plant protection charges
5. Cost of plantation
6. Interest on fixed capital
7. Depreciation
8. Machinery
9. Rental value of owned land

Interest on working capital:

Interest on working capital was worked out on the basis of items like planting material (t budded and normal plant), fertilizers, chemicals, hired human labour, repair and maintenance of machinery and machines hired for operations. The actual prices paid out by the farmers for these items were taken in to account. The interest on variable costs was calculated at the rate of 7 per cent per annum as per the rate charged by the financial institution for short term credit. The interest was calculated for half of the length of crop production period (*i.e.*, for 3 months).

Depreciation

It is a decline in the value of a given assets due to the use, wear and tear and time obsolescence. Straight-line method is most commonly used method for computing the depreciation.

Depreciation on farm buildings and machineries excluding tractor and its accessories was calculated with the help of following formula:

$$\text{Depreciation} = \frac{\text{Purchase price of an asset - Junk value}}{\text{Expected life of the asset in years (expected life)}}$$

After calculating total annual depreciation of the farm, the depreciation for a particular crop was worked out by using the following formula:

$$\text{Depreciation For crop of 'X'} = \frac{\text{Total annual depreciation}}{\text{Total cropped area (in ha)}} \times \text{Area under crop 'X'}$$

(Where 'X'= ber crop)

Depreciation on tractor and its accessories and human labour was not calculated as these were evaluated on the basis of prevalent hire charges in cost computation. Minor agricultural implements were assumed to be depreciated in one year.

Interest on fixed capital

Interest on present value of fixed assets (excluding land) such as implements, machinery and buildings were calculated at the rate of 12 per cent per annum as per the rate charged by the financial institution for term loans.

Rental value of owned land

Rental value of owned land was assessed on the basis of rent paid for the similar category of land in the sample villages. It was obtained on the basis of discussion with the sample farmers in the selected villages.

Results

Table 1: Utilization of inputs in Ber cultivation

Input	Category	Rupees
Variable cost		
Human labour	Male Female	200*15= 3000 200*21= 4200
Plantation	T budded plant Normal plant	27000 7200
Fertilizers	Nitrogen (80 kg/ha) Phosphorus (62 kg/ha) Potassium (49 kg/ha)	1750 1400 650
Irrigation	Surface / flood Drip	1000 4500
Plant protection charges	Fencing Weeding Pesticide & Insecticide	5600 1800 2500
Total variable cost		60,600
Fixed cost		
Machinery	Hired labour Owned labour	400 3500
Implements		1500
Farm buildings		500
Interest on fixed capital		1000
Rental value of owned land		86000
Total fixed cost		92,900
Total cost (variable cost + fixed cost)		60,600+92,900 = 1, 53, 500

Above the study we find the result about the investment on human labor per hectare in which majority of amount 4200 (₹) were invested on female labor and 3000 (₹) is invested on male labor. The findings of this study have a close connection with the findings of the study Khai (2021) [1] and Tiwari (2018) [2] and that the investment on machine labor per hectare in which 3500 (₹) was invested on owned labor and 400 (₹) was invested on hired labor. The findings of this study have a close connection with the findings of the study Tiwari (2018) [2] and R Sharma (2017) [3].

The cost of plantation of ber in which 27000 (₹) was invested on T budded plant and 7200 (₹) on normal plant. An average life time of one plant is for 5 years so the average cost of plantation will be 6840 (₹) per ha per year. The findings of this study have a close connection with the findings of the study Tiwari (2018) [2], Bajaj (2013) [4] and Mirani Zaheeruddin (2013) [5].

It was clearly evident from the table 1 that the majority of the farmers spent 14000 (₹) per hectare for phosphorus fertilizers, followed by 1250 (₹) was invested per hectare on Nitrogen fertilizers and 650 (₹) per hectare on Potassium fertilizers we consider the quantity of fertilizers applied per hectare the order changes in descending to ascending as Nitrogen (80 kg/ha), Phosphorous (62 kg/ha) and Potassium (49 kg/ha). The findings of this study have a close connection with the findings of the study Nidhi Dalal (2018) [6].

Table 1 reveals about the irrigation cost per hectare in which1000 (₹) was invested on flood/surface irrigation and 4500 (₹) on Drip irrigation.

Table 1 reveals about the plant protection charges per hectare in which 5600 (₹) was invested on fencing followed by 2500 (₹) invested on Pesticides and Insecticides and 1800 (₹) invested on Weeding. The findings of this study have a close connection with the findings of the study Tiwari (2018) [2] and R Sharma (2017) [3].

Table 1 reveals about the depreciation on farm equipment in which 1500 (₹) was depreciated on implements and 500 (₹) on farm buildings. Straight line method was used to calculate depreciation and total farm equipment cost was

9500(₹) and the scrap value is 2000(₹). The life span of the implements is 5 years. So, the depreciation would be hence, the amount of depreciation on implements would be 1500(₹).

The cost of farm buildings is 1,75,000(₹) and the scrap value is 30,000(₹). The useful life is 25 years. Then, the depreciation cost will be 500(₹)

Table 1 reveals about the interest on fixed capital in which 1000 (₹) was invested on Interest on fixed capital in a year. This shows that the amount spend on fixed capital was so minimum in ber cultivation. The variable cost decides the cost of cultivation whereas the fixed capital plays a side role in ber cultivation.

Table 1 reveals about the rental value of land in which 86000 (₹) was invested in a year on rent of land owned for the ber cultivation purpose.

Calculation of Total Cost of Cultivation/Hectare/Year

It was clearly evident from the table 1 that 92900 (₹) was the total fixed cost and about 60,600 (₹) was spend as the total variable cost and accumulated it was 1,53,500 (₹) as the total cost of cultivation for Ber. Out of this cultivation costs plantation cost along charged 6,840 (₹), which was the highest spend amount by the ber farmers, the cost of spend on fertilizers per hectare was minimum in amount (3,300 ₹). The findings of this study have a close connection with the findings of the study Tiwari (2018) [2] and R Sharma (2017) [3].

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