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Economics of Henna in Semi-arid Rajasthan

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Abstract: Henna is a perennial shrub grown on a commercial scale in semi-arid Rajasthan for its dye-rich leaves. This paper provides information on the economic aspects of henna production in Pali district of Rajasthan, which is the main henna growing belt and accounts for 96% area under its plantation in the state. The analysis revealed that cost of establishing this crop in initial year was Rs. 15890 ha^{-1}, with labor, seedlings and ploughing accounting for 55, 30 and 15% of the expenditure, respectively. Subsequently, at a recurring cost of Rs. 8464 ha^{-1}, the crop on an average fetched a net annual return and family labor income of Rs. 6192 and Rs. 11853, respectively. As labor accounted for major share of both establishment cost and recurring cost (about 94%), mechanization of weeding, intercultural and harvesting can further increase the profitability further. A separate regulated market for trading of dry henna leaves is functioning in Sojat city of Pali district. Henna producers generally sell their produce in this market and get remunerative prices. Dry henna leaves after processing at Sojat and Faridabad (Haryana) are marketed not only within country but exported to other countries.

Key words: Henna, arable crops, cultivation practices, cost and returns.

Henna (*Lawsonia* sp.) is a white or pink flowered perennial shrub belonging to family Lythraceae and popularly known as mehndi. It is widely used to dye hands and hair to improve its luster. The essential oils extracted from henna flowers are used by perfume industry in some parts of the country. The demand of henna is growing in the world in general and the Middle-east and western world in particular due to growing fear of carcinogenic effects of synthetic dyes (Korwar and Pratibha, 1998).

Henna is cultivated on commercial scale in semi-arid Rajasthan particularly in Pali district, which is the main henna growing belt covering around 96% of henna area in the state. It is also cultivated in few other parts of the country as a hedge or for production of flowers for extracting oil. Very little information is available on the economic aspects of commercial henna production. An attempt has been made in the present paper to analyze the economics of henna versus other arable crops in Pali district of Rajasthan.

Methodology

Pali district alone has around 96% of henna area in the state. The annual compound growth rate of henna (7.17%) was the highest compared to arable crops grown in the district (Table 1). Sojat tehsil in Pali district, which has around 66% of the district's henna area (Table 2), was selected for the present study. A total of 60 farmers were selected from village Sojat II and Bilawas for the purpose of primary data collection. Relevant data for the year

Table 1. Annual compound growth rate of area under henna and arable crops in Pali district of Rajasthan (1991-92 to 2000-01)

Crop	CGR (%)
Henna	7.17
Sorghum	2.85
Pearl millet	-2.52
Sesame	-9.62
Wheat	0.22
Mustard	-9.21

1999 were collected for henna and arable crops using personal interview method. The simple tabular analysis was used for analyzing the collected data. For computing annual Compound Growth Rate (CGR) exponential function in the following form was fitted:

$$Y_t = b_0 \quad (b_1)^t$$

where,
Y is crop area in ha, and t is time in years.

Annual compound growth rate, r, was computed as:

$$r = [\text{Anti log } (b_1) - 1] \times 100$$

Table 2. Tehsil wise area under henna in Pali district (2000-01)

Tehsil	Area (ha)	% of district
Pali	196	0.69
Bali	4	0.01
Desuri	63	0.22
Marwar Jn.	7598	26.85
Sojat	18793	66.40
Raipur	1095	3.87
Jaitaran	437	1.54
Rohat	112	0.40
Sumerpur	5	0.02
Total	28303	100.00

Source: District Land Record Office, Pali.

Results and Discussion

Socio-economic profile of cultivators

In Sojat tehsil of Pali district, 36% of the 60 henna cultivators interviewed were small size farmers, while 32% each were medium and large farmers (Table 3). The average family size in the respective category was 6.36, 9.00 and 8.26. In addition to cultivating their own land, around 37% of the large farmers also cultivated land on lease basis. The average operational holding size in Sojat was 4 ha with 1.37, 3.08 and 7.89 ha area on the small, medium and large farms, respectively.

Investment pattern

The fixed investment of a cultivator includes expenditure on farm machinery and implements, well, engine/pumpset, irrigation channel and shed for machinery, etc. The fixed investment on an average farm was Rs. 37,158, out of which farm machinery and implements alone accounted for about 76% (Table 4). The investment on well, engine/pumpset, irrigation channels and shed for machinery was 15, 4, 3, and 2%, respectively.

Cropping pattern

Kharif: Out of total area cultivated in kharif season 68% was under henna plantation (Table 5). In arable crops highest area was under pearl millet (12%), followed by sesame and sorghum (8% each) and maize (2%). Major area under henna cultivation was rainfed. The area under henna plantation is increasing every year because it gives some assured returns as compared to arable crops under erratic rainfall conditions of arid Rajasthan.

Table 3. Socio-economic profile of henna cultivators

Category	Sample size	Age (Yr)	Schooling (Yr)	Family members			Operational holding (ha)		
				Male	Female	Total	Irrig.	Unirrig.	Total
Small	22	45.41	3.95	3.55	2.82	6.36	0.57	0.80	1.37
				(56)	(44)	(100)	(41)	(59)	(100)
Medium	19	47.32	4.11	4.74	4.26	9.0	0.92	2.16	3.08
				(53)	(47)	(100)	(30)	(70)	(100)
Large	19	42.05	4.84	4.32	3.95	8.26	2.46	5.42	7.89
				(52)	(48)	(100)	(31)	(69)	(100)
Overall	60	44.95	4.28	4.17	3.63	7.80	1.28	2.69	3.97
				(53)	(47)	(100)	(32)	(68)	(100)

Irrig. = Irrigated, Unirrig. = Unirrigated, Note = Figures in parentheses indicates per cent to total.

Rabi: In rabi season wheat alone occupied 39% of the total cropped area (Table 6). Fennel and mustard were other important crops occupying 24 and 11% area, respectively. The area under mustard crop is decreasing in the study area due to low profit in this crop. The reason may be more import of edible oils in domestic market resulting in stagnation or decline in mustard prices. The area under fennel is increasing due to comparatively high profit associated with this crop.

Cultivation practices

Cultivation practices henna crop are indigenously developed over the past five decades. Seeds are sown in the month of March in nursery and the seedlings are transplanted in the field during July to August coinciding with monsoon rains. Skilled labor, trained in henna transplanting, is employed at higher wages. Generally, no manure, fertilizer, and plant protection measures are used, and a single cutting of leaf crop is taken every year under the rainfed conditions. The crop is highly susceptible to rainfall during its harvest stage and areas receiving good rainfall during October-November months are not suitable for its cultivation.

Cost and returns

Establishment cost: The overall establishment cost of henna was Rs. 15,890 ha^{-1} (Table 7), and ranged from Rs. 15,707 (small farmers) to Rs. 16,532 ha^{-1} (medium farmers). The labor cost alone accounted for 55% of the total establishment cost, since

Table 4. Investment pattern (Rs./farm)

Item	Farm size				% of total
	Small	Medium	Large	Overall	
Farm machinery and implements	13059	25656	48019	28119	76
Well	4663	5379	6888	5594	15
Engine/pumpset	1759	1422	1495	1569	4
Irrigation channel	1717	838	1204	1276	3
Shed for machinery	182	421	1263	600	2
Total	21380	33715	58870	37158	100

Table 5. Cropping pattern (kharif 1999)

Crop	Irrigated area (ha)	Un-irrigated area (ha)	Total area (ha)	% of total cropped area
Henna	4.25 (4)	113.04 (96)	117.29 (100)	68
Pearl millet	12.56 (62)	7.62 (38)	20.18 (100)	12
Sesame	3.29 (25)	10.04 (75)	13.33 (100)	8
Sorghum	5.17 (40)	7.76 (60)	12.93 (100)	8
Maize	1.81 (51)	1.77 (49)	3.58 (100)	2
Others	4.65 (100)	0.00 (0)	4.65 (100)	3
Total	31.73 (18)	140.23 (82)	171.96 (100)	100

Note: Figures in parentheses indicate per cent of total area under individual crop.

especially skilled labor is required for its transplanting. The expenditure on transplanting of seedlings and ploughing was 30 and 15%, respectively.

Recurring cost: Once henna is established in the field only hoeing, weeding and harvesting operations have to be done every year. The overall recurring cost worked out was Rs. 8,464 ha^{-1} with labor accounting for 94% of the total cost (Table 8). The labor was mainly used for hoeing and weeding, cutting, beating, packing operations, etc. The wage rates were high during cutting operations, since especially skilled labor is required for the same. The threat of quality deterioration of the leaf due to rains at harvest time also forces the farmers to complete this operation within short period, which further pushes up the wage rate. Attempts to use combine harvester for the cutting operations to reduce labor cost tried by some farmers, however, was not successful in this crop.

Labor: It is the major cost component of henna production accounting for 94% of the total cost. A total of 52 man-days were required for cultivation of one hectare of henna crop, in which share of family and hired labor was 71 and 29%, respectively (Table 9). Further, compared to arable crops henna has the capacity to give assured employment to family labor under unfavorable environmental conditions.

Returns: A separate regulated market for trading of dry henna leaves is in operation at Sojat city. Henna producers generally sell their produce in this market and get remunerative prices. Dry henna leaves after processing at Sojat and Faridabad (Haryana) are marketed not only in whole country,

Table 6. Cropping pattern (rabi 1999)

Crop	Irrigated area (ha)	Un-irrigated area (ha)	Total area (ha)	% of total cropped area
Wheat	11.69	0.00	11.69	39
Mustard	2.72	0.40	3.12	11
Fennel	7.02	0.00	7.02	24
Others	7.76	0.00	7.76	26
Total	29.19	0.40	29.59	100

Table 7. Establishment cost of henna (Rs. ha^{-1})

Particular	Farm size				% of total establishment cost
	Small	Medium	Large	Overall	
Labor	9138	9195	8500	8823	55
Ploughing	2229	2510	2366	2361	15
Seedling	4340	4827	4766	4706	30
Total cost	15707	16532	15632	15890	100

but exported to other countries too. The average dry leaf production and price observed in henna was 7.52 q ha^{-1} and Rs 1949 q^{-1}, respectively. The average net and gross returns per hectare of henna crop during 1999, a drought year, worked out an average gross return of Rs. 19,086 ha^{-1} during 1995-97 from wasteland plantations of henna in Jodhpur. However, the net profit of Rs. 36,300 ha^{-1} worked out by Kavia and Verma (2001) at the production level of 32 q dry leaves under rainfed

Table 8. Recurring cost of henna (Rs. ha^{-1})

Particulars	Farm size				% of total recurring cost
	Small	Medium	Large	Overall	
Labor	7395	8160	8370	7956	94
Transport	130	82	103	102	1
Packing	168	171	149	159	2
Interest	231	252	259	247	3
Total cost	7924	8665	8881	8464	100

were Rs 6,192 and Rs 14,656 (Table 10), respectively. The family labor income per hectare varied from Rs. 10,645 on large farms to Rs. 12,891 on small farms. The higher returns observed on small farms may be due to more personal care of crop, as use of family labor is higher in this category. Since the crop on an average can produce 10 q leaves per ha, the returns could be higher in this region. Compared to these findings Singh and Gupta (1998) reported condition in Pali district appeared to be exaggerated since such yield levels are possible only under irrigated conditions.

Arable crops versus henna

The major arable crops taken in kharif and rabi seasons are pearl millet, sorghum, sesame, wheat, mustard, fennel, etc. The area under fennel is increasing recently since it is a cash crop and generates more profit compared to other arable crops. The

Table 9. labor employed in henna (man-days ha^{-1})

Type of labor	Farm size				% of total labor man days
	Small	Medium	Large	Overall	
Family	40	36	34	37	71
Hired	11	15	20	15	29
Total	51	51	54	52	100

Table 10. Net returns from henna (Rs. ha^{-1})

Particulars	Farm size			Overall
	Small	Medium	Large	
Production (q ha^{-1})	7.8	7.5	7.2	7.52
Price (Rs. q^{-1})	1925	1945	1980	1949
Gross return	15015	14588	14256	14656
Net return	7091	5923	5375	6192
Family labor income	12891	11683	10645	11853

net returns per hectare worked out were Rs 1472, -198, 510, 25035 and 6141 in pearl millet, sesame, wheat, fennel and mustard, respectively (Table 11). Comparatively, henna recorded higher net return and family labor income except with regard to fennel. Better returns and the capacity to give assured income under unfavorable climatic conditions are the major reasons for enhancement of area under henna plantation in the district.

Constraints

Henna: In general, two-third of the farmers experienced problem in henna production due to high man-power requirement and cost of labor, and damaging rains at harvest. Similarly, non-availability of skilled labor, high fluctuations in market price and lack of proper storage facility were other major constraints reported by 62 to 66% of the henna farmers.

Arable crops: Sixty farmers were interviewed in Sojat tehsil of Pali district on the constraints experienced by them in arable cropping. Highest proportion of the farmers, 82% each, expressed lack of knowledge about improved cultural practices of arable crops and their low risk bearing capacity. Among other constraints, about 75% farmers each, reported high cost and non-availability of farm inputs in time, and their ignorance about various development programs. Similarly, 68 to 71% of the farmers perceived the vagaries of monsoon and the traditional attitude combined with lack of initiation or motivation among the farmers in the area as impediment for successful cropping.

Conclusion

The study indicated 7.17% annual compound growth rate under henna plantation in Pali district from 1991-92 to

Table 11. Cost and returns in arable crops (Rs. ha^{-1})

Particulars	Crop				
	Pearl millet	Sesame	Wheat	Fennel	Mustard
Cost	8400	4950	19110	23805	6018
Production (q ha^{-1})	13.83	2.16	22.5	13.2	11.58
Gross return	9872	4752	19620	48840	12159
Net return	1472	-198	510	25035	6141
Family labor income	4353	1612	6615	33915	8132

2000-01. Farmers are allocating even their good quality land for its plantation because, as compared to arable crops, it has the capacity to give assured returns under erratic rainfall or drought conditions. The analysis revealed that returns were higher in henna as compared to other arable crops like pearl millet, sesame, wheat and mustard. The net and gross returns per hectare worked out were Rs. 6,192 and Rs 14,656, respectively. Henna cultivation also provided sufficient employment to family labor as 71% of man-days used in this crop belonged to this category. In addition to economic returns henna may be helpful in controlling the desertification process in the state.

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