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Research Note

Economics of Production to Marketing of Aromatic Crops in Uttar Pradesh: A Case Study§

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Abstract

The economics of production of three medicinal and aromatic plants, viz. menthol mint, tulsi and vetiver has been worked out using farm-level data from the districts of Barabanki, Sitapur and Raebaerli in Uttar Pradesh. The cultivation of these plant species has been found to be highly profitable, and farmers of these districts need to be made aware about this fact. The net returns over total cost have been found higher for vetiver (₹ 1, 53,933 /ha), followed by menthol mint (₹ 53,250 / ha) and tulsi (₹40,094 /ha). The benefit–cost ratio however has been observed to be highest for menthol mint (3.27), followed by tulsi (3.21) and vetiver (3.04). The employment generation potential of these three crops has also been found quite high. The education of farmers has been found to be influencing the cultivation of aromatic crops. The study has drawn attention to the following aspects: (i) development of a package of improved cultivation practices, (ii) availability of good quality planting material of high-yielding, short-duration varieties, (iii) more demonstration / extension efforts, (iv) better access to timely and adequate credit, (v) access to timely market information, (vi) establishment of regulated market, (vii) introduction of minimum support price. (viii) contract farming. (ix) establishment of testing facilities, and (x) linkage with pharmaceutical and perfumery industries so as to boost cultivation of aromatic crops in the study area.

Key words: Medicinal & aromatic plants, menthol, tulsi mint, vetiver

JEL Classification: Q12, Q 13

Introduction

Medicinal and aromatic plants (MAPs) are receiving considerable attention across the world because they offer a wide range of safe and cost–effective, preventive and curative therapies, which are useful in achieving the goal of 'health for all'. Though there are a number of important medicinal and aromatic plants, this study is limited to three common plants, viz. menthol mint (*Mentha arivensis*), tulsi (*Ocimum basilicum*) and vetiver (*Vetiveria zizanioides*). Menthol mint is an important essential oil-bearing plant, and the *l*-menthol crystallized from the essential oil, de-mentholated oil and specific terpene fractions thereof are widely used in food, flavour, pharmaceuticals and cosmetics. The natural menthol is extensively used in food and confectionery and for providing cooling effect to the skin and mucous membranes of other organs of the body. The menthol mint occupies a prominent place among all the aromatic plants in the country both in terms of production and trade (Singh *et al*., 2007).

Tulsi it is also widely used in soap, pharmaceutical and cosmetic industries, and in aromatherapy, herbal

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tea, toiletry, respiratory syndrome, cold fever, bronchitis and cough. Tulsi is very effective against indigestion, headache, hysteria, insomnia and cholera. The plant has vast potential for cultivation as a short-duration economically-viable aromatic crop and fits well in the existing cropping pattern (Ajjan *et al*., 2009).

Vetiver it is an important tropical grass used widely for environment protection, flavours and fragrances, handicrafts, soaps, cosmetics, perfumery, agarbattis, soft drinks, and as flavouring agent. It is carminative, stimulant, diaphoretic, refrigerant, and used for lumbago, rheumatism, sprains, etc. Since vetiver has a strong root system and is perennial in nature, it is considered useful for soil conservation against erosion of top soil. This plant can be economically exploited for enhancement of rural livelihoods. The cultivation of this crop is picking up due to the conscientious efforts of various research and development organisations, including CSIR-CIMAP.

The present study was conducted to examine the economics of production to marketing of three medicinal and aromatic plants, viz. menthol mint, tulsi and vetiver in Uttar Pradesh.

Methodology

The study was conducted during 2010-11 in the districts of Barabanki, Sitapur and Raebaerli in Uttar Pradesh. At the first stage of sampling, two blocks from each district and then two villages from each block were selected using the information received from the farm office of the Central Institute of Medicinal and Aromatic Plants (CIMAP). Thus, the sample consisted of 100 farmers of menthol mint, tulsi and vetiver. The primary data were collected through personal interview using a pre-tested questionnaire. To study the economics of menthol mint, tulsi and vetiver, simple cost accounting method was followed. The prices used in the analysis were the average for the crop harvesting period 2010-11.

Results and Discussion

Socio-economic Profile and Resource Structure of Sample Farmers

The family size is one of the important factors influencing the cultivation of medicinal and aromatic plants. It was found quite large for the sample households (Table 1). It was also observed that the majority of growers of these plants were literates, that means education generates awareness and induces them to cultivation of medicinal and aromatic plants. The average size of operational holding was very small. Sample farmers grow paddy, wheat and sugarcane on 60 per cent of the total cultivable land and the aromatic crops cover rest of the land. The role of investment pattern being significant in the productivity of a crop enterprise, per farm investment on fixed assets like farm building, irrigation structures, tractor / equipment and distillation units was worked out and are given in Table 1. It was found that investment was highest for vetiver (₹ 1,93,797), followed by menthol mint (₹ 75,830) and tulsi (₹ 72,541).

Table 1. Socio–economic and resource structures of mint, vetiver and tulsi farmers in the study area

Particulars	Menthol mint	Tulsi	Vetiver
Average size of landholding (ha)	1.57	1.06	1.80
Average family size (No.)	8.50	6.50	6.80
Literacy level (%)	89.06	90.98	93.38
Occupation (%)			
Dairy, services and others (%)	28.20	33.33	5.00
Agriculture	71.80	66.67	95.00
Cropping pattern (%)			
Agriculture crops (paddy, wheat, sugarcane, etc.)	60.32	77.48	68.42
Aromatic crops (mentha, tulsi, vetiver, etc.)	39.68	22.52	31.58
Average farm assets (farm building, irrigation structure, tractor/equipment, distillation units) (₹)	75830	72541	193797

Table 2. Cost structure in cultivation of menthol mint, tulsi and vetiver

(₹/ ha)

Particulars	Menthol mint	Tulsi	Vetiver
	Variable cost		
Human labour	4095	3617	10536
	(17.43)	(19.97)	(13.95)
Machine/Tractor	1463	1544	12704
	(6.23)	(8.53)	(16.82)
Suckers/ slips/seeds	1255	1034	11443
	(5.34)	(5.71)	(15.15)
FYM	1034	1000	871
	(4.40)	(5.52)	(1.15)
Fertilizers	1267	1239	1709
	(5.40)	(6.84)	(2.26)
Irrigation	2067	1333	6610
	(8.80)	(7.36)	(8.75)
Interculture	3088	1759	469
	(13.15)	(9.71)	(0.62)
Distillation charges	2087	2269	3918
	(8.89)	(12.23)	(5.19)
Interest on working capital	981	552	8687
	(4.18)	(3.05)	(11.50)
Total variable cost	17338	14346	56948
	(73.82)	(79.23)	(75.41)
	Fixed cost		
Interest on fixed capital	1150	1260	3569
	(4.90)	(6.96)	(4.73)
Rental value of land	5000	2500	15000
	(21.28)	(13.81)	(19.86)
Total fixed cost	6150	3760	18569
	(26.18)	(20.77)	(24.59)
Total cost	23489	18106	75517
	(100.00)	(100.00)	(100.00)

Note: Figures within the parentheses are percentages of respective plants.

Cost Structure of Aromatic Crops

The per hectare cost and return from cultivation of these three crops were calculated at current prices and have been presented in Table 2. The total variable cost was found to be highest for vetiver (₹ 75,517 / ha), followed by menthol mint (₹ 23,489 / ha) and tulsi (₹ 18,106 / ha). The share of variable cost ranged between 74 and 79 per cent of the gross cultivation cost of these aromatic crops. The input-utilization pattern in cultivation of these crops showed that for vetiver the major cost was on machine (16.82%), slips (15.15%), human labour (13.95%) and irrigation (8.75%). In both tulsi and menthol mint, the major costs were on human labour, interculture, distillation and irrigation.

Economics of Aromatic Crops

The economics of cultivation of the selected three plants, presented in Table 3 revealed that the total return per hectare was maximum from vetiver (₹ 2,29,450), followed by menthol mint (₹ 76,739) and tulsi (₹ 58,200). The net return over cost was also highest for vetiver (₹ 1, 53,933 /ha), followed by menthol mint (₹ 53,250 /ha), and tulsi (₹ 40,094 /ha). However, the benefit–cost ratio was highest in the case of menthol mint (3.27), followed by tulsi (3.21) and vetiver (3.04). Therefore, it could be concluded that cultivation of all these three aromatic crops was highly profitable and farmers in these areas should be encouraged to diversify their existing cropping pattern towards these aromatic plants to enhance their farm income.

Table 3. Economics of production of menthol mint, tulsi and vetiver : 2010-11

Particulars	Menthol mint	Tulsi	Vetiver
Yield of oil (kg/ha)	118.06	97.00	17.65
Price (₹/kg)	650	600	13000
Gross return (₹ /ha)	76739	58200	229450
Gross cost (₹ /ha)	23489	18106	75517
Net return (₹/ha)	53250	40094	153933
Cost of oil production (₹/kg)	199	187	4278
Net return (₹/kg)	451	413	8721
B-C ratio	3.27	3.21	3.04

Marketing of Selected Aromatic Crops

The important marketing channels involved in the disposal of these aromatic plants were:

Channel-I:

Producer - Local trader - Industry (company) and

Channel-II:

Producer - Processor - Industry (company).

It was found that about 75 per cent of these aromatic plants growers used Channel-I and only 25 per cent used Channel-II to sell their produce.

Constraints in Production and Marketing of Selected Aromatic Crops

The constraints in production of these aromatic crops, faced by 85 per cent growers, were lack of improved production techniques, non-availability of quality planting material, absence of input subsidies and poor access to credit. About 45 per cent growers reported shortage of labour during harvesting season. The problems in marketing of these aromatic crops, highlighted by 80 per cent growers, were lack of minimum support price, less number of buyers, lower price, absence of legal market information, lack of regulated market, lack of storage facilities, ignorance about quality of produce, lack of testing facilities and delays in payment.

Conclusions

The study has observed that cultivation of menthol mint, tulsi and vetiver is highly remunerative and farmers should be made aware about this fact. However, it is imperative to incorporate suitable cropping pattern to further augment the per unit area return and make the cultivation of these aromatic crop a preferred option in the study area without affecting the production of food crops. There is an urgent need to give attention to the following aspects: (i) Development of a package of improved practices for cultivation of these aromatic crops, (ii) making availability of good quality planting material of high-yielding, short-duration (in case of menthol mint with less water need) varieties, (iii) more demonstration / extension efforts, (iv) better access to timely and adequate credit, (v) access to timely market information, (vi) establishment of regulated market (vii) introduction of minimum support price, (viii) contract farming, (ix) establishment of testing facilities and (x) linkage with pharmaceutical and perfumery industries so as to boost the cultivation of aromatic crops in the study area.

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