

SOCIO-ECONOMIC ASPECTS OF MENTHOL MINT CULTIVATION IN THE DISTRICTS OF UTTAR PRADESH

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ABSTRACT

This study was conducted in the Lucknow and other four main Menthol mint grower districts (Barabanki, Sitapur, Hardoi and Unnao) of Uttar Pradesh on socio-economic analysis of Menthol mint cultivation in the year 2014. The purpose of study was to know about socio economic characteristics of menthol mint growers in this area. In the study, major characters like age group of farmers, level of education, type of family, source of irrigations, annual income and problems associated in mint cultivation were observed. The small farmers of middle age groups were very keen to adopt mint cultivation. This cultivar was also worked out by input costs and output cost at different stages by the conventional/scientific methods. The study has exposed that the major portion of operational cost is shared by hired labour, distillation charges, irrigation and machine/tractor charges. The data shown variables like man labour, machinery, manures and fertilizer and irrigation charges have shown a positive and significant impact on the returns of mentha crop in the study area. The major problems faced by the farmers was high input cost (not easily availability of suckers and its high cost, fluctuated supply of electricity, infrastructural facilities, lack of sufficient cultivation information, low markets cost of the product and costly distillation tank. Majority of menthol mint growers are belonging in joint family systems having more than 6 members in a family. In the districts, bore-well was the main source of irrigation used by the mint growers. The farmers net income was recorded of Rs. 30,000-40,000 per annum.

KEY WORDS: Medicinal and aromatic plants, Menthol mint, *Mentha arvensis*, Koshi, Cash crop

Medicinal and aromatic plants (MAPs) are being paid significant attention throughout the world because of their huge economic potential, mainly in the use of herbal medicines (Kumar et al., 2008 3, 4). *Mentha arvensis* (L) (Commonly known as Menthol mint, corn mint or Japanese mint) is widely used in the food, flavorings, pharmaceutical and cosmetic industries. The menthol Mint oils obtained from *Mentha arvensis* have put India on top of the world map (contribution of U.P. is 56% of the total India production) (In U.P. Barabanki district alone contributing 15% Lucknow 8%, Hardoi 9%, Sitapur 5% and Unnao 7%). A large part of the country's oil production is exported. It meets severe competition in trade with China. A large number of farmers, traders, distillers and exporters are associated with this crop. The investment in the industry is estimated at Rs.400 crores annually.

There are two basic types of menthol mint one is natural and other is synthetic. Synthetic menthol comes in the form of l-menthol crystals that are derived from the plant's essential oil. Industry, however, prefers the natural version because the scent of synthetic menthol is affected by

contaminants that arise during the crystallization process (S. Kumar et al., 2008). Menthol mint (*Mentha arvensis*) is growing in the different cultivar such as Kosi, Saksham, Himalaya, and Kalka. The essential oil content was found to vary from 0.3%-1.2%, 0.42%- 1.1%, 0.38%- 1.0% and 0.26%- 1.2%, respectively. The menthol content was varied from 32.92%- 42.83% in the above mentioned cultivar (Singh et al., 2007). Menthol mint is cultivated in a large area in the Indo-Gangetic plains in the states of Punjab, Haryana, Uttarakhand, Uttar Pradesh and Bihar (Khanuja et al., 2005). The major districts in Uttar Pradesh where this crop is being cultivated are Badaun, Bareilly, Sahajanpur, Pilibhit, Lakhimpur Khiri, Barabanki and Ambedker Nagar (Kumar et al., 2011). Now this crop has been cultivated in all the districts of Uttar Pradesh along with entire north India region.

This study was mainly focused on the subsequent aspects of the menthol mint cultivation: (a) Socio-economic status of the menthol mint growers (b) Problems associated in the menthol mint cultivation, and (c) Production values and appropriate

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recommendations for encouragement of menthol mint cultivation.

METHODOLOGY

The study was conducted during the year 2012-2013, the Barabanki, Sitapur, Lucknow, Hardoi and Unnao districts of Uttar Pradesh were selected for this study. Because, in these areas farmers are being cultivated Menthol mint as a cash crop in the large scale. *The Mentha arvensis* var. Koshi was the main variety which is cultivated in these areas. From the above mentioned districts, 50 farmers (10 from each district) were selected randomly for this study. During the personal interview of farmers only one farmer was selected from a. Indirectly this report contained around 5000 farmer's data in the menthol mint cultivation.

The major data were collected through personal interview using a pre-formatted survey form, while the derivative data were collected from the publication of journals and other government agencies. For the study, the economics of menthol mint, education level, cost of oil and cost of investment the average accounting method was performed.

RESULTS AND DISCUSSIONS

Socio-Economic Status of Farmers and Their Resource Structures

The data from the chosen farmers were composed and analyzed with respect of their average family size, literacy status, occupation, other agriculture crops, MAP crops other than menthol mint and tools used in menthol mint production and are mentioned in the following Table 2. The average family size was about 7.18 persons in the chosen districts. About 83.75 per cent population was observed literate in these districts. The farmers are also cultivating some other MAPs crops such as *Artemisia* and *Ocimum* in these areas.

More than 70% population in the study areas was exclusively dependent on agriculture for living (Only 10% farmers are cultivated medicinal and aromatic crops). The average landholding size was found around 1.08 hectare per family. Menthol mint has taken an important position in the cropping pattern by representing about 34 per cent area during

the year 2011-12. The major investment was made by the farmers on the field preparation i.e. ploughing agriculture equipments, distillation units, irrigation facility, fertilizer and pesticides etc as mentioned in the Table 2.

Cost Investment in Mentha Cultivation

The per hectare costs in the cultivation of Mentha was varied according to geographical conditions of area and on the availability of natural resources. Total cost investment in the Mentha cultivation is tabulated in the table-3. The preparational cost of Mentha cultivation was found slightly higher in the district of Lucknow and Unnao, because of higher expenditure on irrigation, distillation charges and labors charge. During this study it was observed that there is a big investment is needed for the irrigation of the crop in Hardoi district.

Economics (Oil Production) Of Mentha Cultivation

The cost of oil and amount of oil of Mentha cultivation in the mentioned districts are tabulated in the Table 4. It was found, that the farmers had got an average 100 kg of Menthol mint oil from one hectare of land. The average cost of mentha oil was 1300 Rs. per kg during 2012-2013. The highest net gain was observed by the farmers of district of Barabanki, while the farmers of Sitapur and Lucknow had got moderate net gain. The lowest net gain was estimated in the farmers of Hardoi district.

Net Estimation of Income in the Districts

The different variables like labour, machinery, manures and fertilizer and irrigation charges has played a positive and important impact on the returns of menthol mint crop in the study areas. The gross gain was found maximum in the district of Barabanki and lowest gross gain was estimated in the district of Hardoi as showed in the Table 4. The farmers of these areas are earning around 1,15,590 rupees (Table-5) by the cultivating of menthol mint. In this amount after the deduction of land cost and farmers self labour charge, the final gain of the farmers is around 30,000 to 40,000 rupees in one season.

Major Problems Associated In The Menthol Mint Cultivation

The major problems associated by the menthol mint farmers in the study area were specified mainly into following categories- high investment charge, extensive weeds, unsustainable market, expensive distillation unit and lack of financial support etc as showed in the table-6.

Other problems were climate change, unsustainable market information and lack of information about harvesting time. The major problems were lack of awareness about export market, illegal trade and survival of intermediaries between farmers and processors and industry. The menthol mint grower was also facing lack of financial support and poor quality of distillation units.

Table1: Estimated area and production of Menthol mint in India during 1995-2012

Year	Approx cultivated area (ha)	Approx. production of Mentha oil (Tonnes)
1995	80000	7000
1996	120000	9000
1997	170000	14000
1998	133000	12000
1999	125000	11000
2000	150000	14000
2001	155000	14500
2002	150000	14000
2003	150000	15000
2004	150000	15000
2005	160000	16000
2006	160000	16000
2007	170000	17000
2008	180000	18000
2009	160000	16000
2010	170000	18000
2011	160000	19000
2012	180000	20000

Source: Singh and Khanuja (2007), S. Kumar et al. (2011) and www. nhb.gov.in

Table 2:Socio-economic and resource structure

Particulars	Barabanki	Sitapur	Lucknow	Unnao	Hardoi
Average family size (No.)	8.12	6.23	7.78	7.23	6.54
Literacy status of family members (%)					
Literates	83.06	81.12	90.09	88.16	76.32
Occupation of family (%)					
Agriculture	69.61	74.12	61.80	65.25	70.56
Others (Milk production)	34.89	20.78	35.57	25.91	20.53
Pattern of cropping in hectare (%)					
Agricultural crops (rice, wheat, and pulses etc.)	60.57	54.37	51.28	62.38	70.45
Aromatic crop (Mentha/Artemisia)	40.32	43.85	40.86	35.10	10.59
Tractor/cultivator, distillation tank)	50.77	40.23	55.27	20.12	15.89

Table 3: Cost investment of Mentha cultivation (Rs. /hectare) in the districts

Particulars	Barabanki	Sitapur	Lucknow	Unnao	Hardoi
Labours cost	2750	3087	4307	4227	2010
Machine/Tractor ploughing cost	2210	2148	2860	2648	2000
Seed/ suckers cost	1075	1500	1840	1910	1700
Manure cost	1580	1650	1840	1955	1680
Fertilizers cost	2000	2431	2500	1856	2037
Irrigation cost	2200	2500	3100	2500	3450
Distillation charges	2100	2310	1950	2357	2539
Insecticides/pesticides cost	500	650	600	610	580
Total cost (Rs)	14,415	16,276	18,997	18,063	15,996

Table 4: Economics of Mentha cultivation in the districts

Particulars	Barabanki	Sitapur	Lucknow	Unnao	Hardoi
Oil in Kg/ hectare	115	108	105	100	82
Cost of oil/Kg.	1350	1300	1350	1300	1150
Gross gain in Rs./hectare	1,55,250	1,40,400	1,41,750	1,30,00	94,300

Table 5: Net gain estimation in Mentha cultivation (Rs./hectare)

Particulars	Barabanki	Sitapur	Lucknow	Unnao	Hardoi
Gross gain in Rs./hectare	1,55,250	1,40,400	1,41,750	1,30,000	94,300
Total investment Rs./hectare	14,415	16,276	18,997	18,063	15,996
Net gain Rs./ hectare	1,40,835	1,24,124	1,22,753	1,11,937	78,304

Table 6: Problems linked with farmers in Menthol mint cultivation

Sr. No	Problems	Barabanki (%)	Sitapur (%)	Lucknow (%)	Unnao (%)	Hardoi (%)
Problems of production						
1.	Lack of scientific knowledge of mentha cultivation	60	70	56	80	82
2.	Problem of electricity	60	60	75	70	75
3.	High investment cost	85	88	85	82	90
4.	Lack of trade information	85	90	76	80	90
5.	Lack of financial support	90	92	90	94	95
6.	Lack of high quality varieties	30	50	35	40	60
Problems of infrastructural						
6.	Lack of infrastructure (Tractor/bore well)	80	85	65	70	79
7.	Lack of scientific quality distillation tank	70	80	75	78	95
8.	Expensive distillation unit	89	90	85	90	92
Problems related to trade						
9.	Lack of relation between farmers and market	85	88	75	80	90

CONCLUSIONS

The study has exposed that the major source of earning of farmers as a menthol mint after cereal crops. The investments like machines, manures and fertilizers, human labour, irrigation and distillation cost have been observed to directly influence the production as well as profits of the farmers. The major problems being faced by the farmers have been

reported as lack of crucial infrastructure and unregulated marketing system. The study was also paying attention about the need for scientific awareness towards the development of high yielding varieties of Menthol mint and availability of high throughput distillation facility for the development of menthol mint cultivation. The other immediate need is to establish better processing methods for

distillation of oil from the menthol mint for establishing quality assurance. The study is also directed towards the availability of fund to the farmers from national agencies and related industries for the betterment of the menthol mint cultivation.

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