Mysore J. Agric. Sci., 51 (4) : 877-882, 2017

Production and Marketing of Sweet Lime *vis-a-vis* Labour Contracts in Ananthapur District

H. S. Manjunatha and C. P. Gracy
Department of Agricultural Marketing, Co-operation and Business Management,
College of Agriculture, UAS, GKVK, Bengaluru - 560 065
E-mail : gracycp@gmail.com

Abstract

The costs and returns in sweet lime production, contractual labour arrangements in sweet lime production and marketing and price spread in different channels of sweet lime marketing were computed from a random sample of sixty sweet lime cultivators and twenty labour contractors of Ananthapur district. Ten market intermediaries each from Ananthapur, Hyderabad and Bengaluru markets were drawn for marketing efficiency analysis. The data through personal survey of farmers for the 2015-16 crop season revealed that the investment on one acre of sweet lime orchard for first the year was ₹ 1,54,100, while during the three years of gestation period (from 2nd through 4th year) was ₹ 1,01,255. The cost of cultivation was ₹ 38,727 per acre during bearing period yielding about 5 tonne of produce annually contributing a gross return of ₹ 1,58,355. The pruning and harvesting activities of sweet lime were performed through contractual labour arrangements. More than 4/5th (83 %) of the farmers sold through Channel-II (Producer → Pre-harvest contractor → Distant wholesaler → Distant retailer → Distant consumers) compared to channel-I (Producer → Commission agent cum wholesaler → Local retailers → Local consumers). Price spread was higher in Channel-II (₹ 28,275) compared to Channel-I (₹ 10,720). While, marketing efficiency was higher in Channel-I compared to Channel-II.

Keywords : Sweet lime, marketing channel, contract labour, cost of cultivation

Sweet lime is native to South and South-East Asia and also cultivated in the Mediterranean. Globally, the leading producers of sweet lime are China, Brazil, USA followed by India and Mexico. Citrus is the second most important tropical fruit crops of India after Mango with an area of 93.50 thousand hectares and 11,515 thousand metric tonne of production during 2015-16. The prominent citrus growing states in India are Andhra Pradesh, Maharashtra, Telangana, Orissa, Gujarat and Uttarakhand.Sweet lime is grown in an area of 275 thousand hectares with a production of 4229 thousand tonne and productivity of 15.40 MT/ ha. Andhra Pradesh ranks second in production of sweet lime with 1217 thousand tonne and second in area accounting to 72.90 thousand hectares and ranks second in productivity with 16.70 MT/ha; Ananthapur district accounts for 50 thousand hectares of sweet lime acreage. The objectives of the study were :

1) To analyse costs and returns structure of sweet lime cultivation.
2) To examine the contractual labour arrangements in sweet lime products and marketing, and
3) To analyse price spread in different channel of sweet lime marketing.

Material and Methods

Ananthapur consists of 63 mandals, of which five mandals *viz.,* Garladinne, Gooti, Pamidi, Ananthapur and Tadipatri were purposively selected based on highest area under sweet lime cultivation. Sixty sweet lime farmers representing 12 from each mandal were selected randomly. Three wholesale markets (APMCs) for sweet lime trade were selected from Andhra Pradesh (Ananthapur), Telangana (Hyderabad) and Karnataka (Bengaluru) for computing price spread in local and distant markets of sweet lime using a sample of ten market intermediaries from each market. Hence, the total sample size of market intermediaries was 30. The data on contractual labour arrangements in sweet lime production and marketing was obtained from 20 labour contractors covering all the five mandals.

The costs incurred in sweet lime orchards up to the bearing stage were classified into initial investment, costs during gestation period and for bearing period. Similar methologies were adopted for kinnow production and marketing (Bhat *et al.,* 2011; Geetha Verma *et al.,* 2015; Manpreet Kaur and Naresh Singla, 2016). Marketing efficiency pertains to the outcome of marketing efforts, which can be viewed as a ratio between value of output and cost of performing marketing functions. There are two methods of computation, *viz.,* Shepherd's method and Acharya's modified measure. Shepherd suggested that the ratio of total value of goods sold (retail price) in the market and the gross price spread (marketing cost and margin) as a measure for marketing efficiency, while, Acharya's modified measure is the ratio of net price received by farmers to gross price spread (Acharya and Agarwal, 2011).

Results and Discussion

The land holding and size-wise classification of sweet lime orchards of sample cultivators reveals that the average size of land holding was 9.91 acres (Table I). Among these, average rain-fed area was 2.23 acres and the irrigated area was 7.68 acres.The size-wise classifications of sweet lime orchards revealed that about 1/3rd constituted below 2.5 acres group. Similarly, 2.5-10 acres constituted 58.34 per cent. However, very few orchards (5) were in more than 10 acres category.

Table I

Land holding pattern and size-wise classification of sweet lime orchards of sample cultivators (n=60)

Particulars	Values	Percentage to total
Land holding (Acres/farmer)		
Rainfed	2.23	22.50
Irrigated	7.68	77.50
Total	**9.91**	**100.00**
Size-wise classification of sweet lime orchards (number of respondents)		
Up to 2.5 acre	20	(33.33)
> 2.5 to 5 acres	16	(26.67)
> 5 to 10 acres	19	(31.67)
Above 10acres	05	(8.33)
Total	**60**	**(100.00)**

The details on costs and returns of sweet lime cultivation were gathered from respondents to compute profitability of the crop. The gestation period of sweet lime is four years. Therefore, the expenditure incurred in raising orchard up to four years after planting is considered for computing establishment cost. Expenditure on land levelling, digging of pits and planting, planting material, plant protection, irrigation and input costs were considered.

The investment cost of sweet lime cultivation is presented in Table II. It may be observed that material cost was the highest amounting to ₹ 1,01,829 (66.08 %) compared to labour cost which amounted to ₹ 24,322 (15.78 %) per acre. Thus, the total cost of investment in the first year amounted to ₹ 1,54,100 per acre. The per acre cost incurred by the sweet lime growers during the second through fourth years of gestation period was ₹ 1,01,255 of which, the total variable cost amounted to ₹ 53,031 with a share of 52.37 per cent of total cost. In the total variable cost, the share of material input was found to be 28.69 per cent, followed by labour (18.93 %) and management cost (4.76 %).

The maintenance cost during bearing period included expenditure on labour, material cost and fixed costs such as land revenue and depreciation on machinery etc. (Table III). The annual average total maintenance cost was ₹ 49,660 per acre. Among the various items of expenditure, the total fixed cost (₹ 27,465) constituted the highest proportion (55.31%), while the variable cost constituted 44.69 per cent (₹ 22,195). Among the variable costs, expenditure on material and labour input cost constituted 26.56 and 14.07 per cent, respectively. A major portion of the material cost was towards manure (₹ 7,467) which accounted for 15.04 per cent of the total maintenance cost, followed by fertilizers and PPC with a share of about 5.90 and 5.16 per cent, respectively. The average labour cost was ₹ 6,985 per acre, of which irrigation, watch and ward (5.79 %), followed by pruning (2.08 %) were the major activities. The overall average gross returns accounted to ₹ 1,58,355 per acre for

TABLE II

Establishment cost of sweet lime orchard

(per acre)

Particulars	First year		2nd through 4th year total	
	Value (Rs.)	Per cent	Value (Rs.)	Per cent
A. Labour cost				
Land levelling/ loosening of soil around plants	13,882	9.01	1,500	1.48
Opening of pits	4050	2.63	-	-
Planting/ gap filling	550	0.36	420	0.41
Application of fertilizer and FYM	990	0.65	3010	2.97
Application of PPC	1,150	0.75	1,720	1.70
Weeding and land cleaning	1,200	0.78	2,110	2.08
Irrigation, watch and ward	2,500	1.62	6,170	6.09
Inter-cultivation	-	-	2285	2.26
Pruning	-	-	1950	1.93
Total labour cost	24,322	15.78	19,165	18.93
B. Material cost				
Manures /FYM	4,500	2.92	9,400	9.28
Fertilizers	3,648	2.37	9,500	9.38
PPC	3,080	2.00	8,950	8.84
Planting material	8,801	5.71	1,195	1.18
Fencing	75,300	48.86	-	-
Sprayer	6,500	4.22	-	-
Total material cost	1,01,829	66.08	29,045	28.69
Variable cost (VC) = (A+B)	1,26,151	81.86	48,210	47.61
C. Managerial cost (10% of VC)	12,615	8.19	4,821	4.76
Total-I = (A+B+C)	1,38,766	90.05	53,031	52.37
D. Rental value of land	13,944	9.05	43,840	43.30
E. Depreciation	1,390	0.90	4,384	4.33
Total - II= (D+E)	15,335	9.95	48,224	47.63
Total cost (I+II)	1,54,100	100.00	1,01,255	100.00

TABLE III

Cost of cultivation of sweet lime during bearing period

(per acre)

Particulars	Values	Percentage to total
I. Variable cost		
A. Labour cost		
Loosening of soil around the plant and formation of basin	858	1.73
Application of fertilizers and FYM	707	1.42
Application of PPC	589	1.19
Weeding and land cleaning	356	0.72
Inter-cultivation	495	1.00
Gap filling	74	0.15
Pruning	1,032	2.08
Irrigation, watch and ward	2,874	5.79
Total Labour Cost	6,985	14.07
B. Material cost		
FYM	7,467	15.04
Fertilizers	2,932	5.90
PPC	2,562	5.16
Planting material (Gap filling)	231	0.47
Total Material Cost	13,192	26.56
Variable cost (VC) = (A+B)	20,177	40.63
Managerial cost (10% of VC)	2018	4.06
Total Variable Cost	22,195	44.69
II. Fixed cost		
Rental value of land	15,029	30.26
Amortized establishment	10,933	22.02
Depreciation	1,503	3.03
Total fixed cost	27,465	55.31
Total cost (I+II)	49,660	100.00
Gross return (Rs.)	**158,355**	
Net return (Rs.)	**108,695**	

2015-16 season. The total production cost was ₹ 49,660 per acre resulting in an annual average net return of ₹ 1,08,695 per acre.

Sweet lime production is predominant in Ananthapur district and to meet the skilled labour requirement of regular pruning and harvesting operations, informal labour arrangements are prevailing. In villages, a group of labourers from different households work with a labour contractor who is responsible to obtain work orders from sweet lime cultivators. Data from 10 pruning and 10 labour contractors were obtained for detailed analysis.

The average operational area of the labour contractors extended to 1.60 and 1.30 mandals for harvesting and pruning activities, respectively and the average years of experience in this business was 18.00 and 18.90 years for harvesting and pruning operators, respectively. The harvesting labour constituted 36 labours from 22 families in a group while, in the case of pruning, about 9 labours from 8 families. Number of orchards contracted for harvesting operations was about 98 per contractor providing employment for 135 days per year for 36 workers and the contractors for pruning managed about 80 orchards with 9 labours for 126 days per year (Table IV).

TABLE IV

Profile of harvesting and pruning labour contractors

Particulars	Harvesting	Pruning
Loosening of soil around the	858	1.73
Operational area (No. of Mandals)	1.60	1.30
Experience (Years)	18.00	18.90
Labours per group (Number)	36.00	9.30
Families involved in a group (Number)	22.00	7.70
Working hours per day	7.00	7.70
Orchards contracted per group (Number/annum)	98.20	79.70
Days engaged in sweet lime orchards (Number/annum)	135.00	126.00

It could be observed from Table V that 50 per cent (5 labour contractors) of the harvesting contractors made labour payments daily while the remaining 50 per cent settled the payments on a weekly basis to workers engaged by them. It may be mentioned here that, irrespective of the hours of work, wages are determined on per day basis for both pruning and harvesting operations. In the case of pruning operations, 70 per cent of the labour contractors settled the payments daily and the remaining 30 per cent (3 labour contractors) of them on weekly basis. Regarding terms of contract, eight of the harvesting contractors had short term contracts with labours while the remaining 2 groups had long term contracts with the harvesting labours. While that of pruning, all the 10 labour contractors were involved in long term contract with labours. Short term contract may extend from one day to several days during the season. While long term contract refers to several days to a few months duration. Pruning labours are sourced from the same village who arrive at the designated orchard using own conveyance, while harvesting labour from different locations are transported in trucks/canters to orchard premises by contractors and are dropped off at the nearby location convenient to labours. Similarly, harvesting labourers are supplied with meals and refreshments on job, while pruning labourers make their

TABLE V

Terms of labour contractual arrangement

(=10 each/activity)

Activity	Frequency of payments (number)			Nature of contract (number)			Food and refreshments	Transport arrangement for workers
	Daily	Weekly	Total	Daily	Weekly	Total		
Harvesting	5	5	10	8	2	10	Provided	Provided
Pruning	7	3	10	0	10	10	Not provided	Not provided

own arrangements. Pruning wages for male workers is slightly lower than harvesting wages of their counterparts.

In Ananthapur district, two predominant types of marketing channels were identified for dispatching sweet lime from producers to consumers. In channel-I, the producers sold to local commission agent-cum-wholesalers and who in turn sold to local retailers and ultimately to consumers within Ananthapur district. About 16.67 per cent of the farmers traded through channel-I, who sold 282 tonnes accounting for 15.94 per cent.

Channel-I : Producer → Commission agent–cum-wholesalers → Local Retailers → Local Consumers

In channel-II, pre-harvest contractors bought sweet lime at a certain pre-agreed price from farmers at the farm gate itself on weighment basis and sold the same to wholesalers in distant markets who in turn moved it to the hands of retailers. A majority of the respondent farmers (83.33 %) participated in channel-II amounting to total sale of1488 tonne or about 84.06 per cent of total produce.

Channel-II: Producer → Pre-harvest contractor → Distant wholesale traders → Distant Retailers → Distant Consumers.

The price spread, net producers share in consumer's rupee and margins of market intermediaries are presented in Table VI. It was observed that the net producer's share in consumer's rupee was found to be more in channel- I of marketing (79.95 %) compared to channel-II (56.91 %). Correspondingly the net price received by the producer per tonne of sweet lime was the highest in channel-I (₹ 42,750 / ton) compared to channel-II (₹ 37,346 / ton). The price spread was substantially higher in channel-II (₹ 28,275 / ton) compared to channel-I (₹ 10,720 / ton). In channel-II, the margin of pre-harvest contractor was ₹ 6,500, whereas, for distant traders it was ₹ 4,327 and for distant retailers it accounted to ₹ 6,150 per ton. Similarly, in channel-I, the margin of local retailers was higher (₹ 4,400 / ton) than that of commission agent-cum-wholesaler (₹ 3,800 / ton).

TABLE VI

Price spread of sweet lime marketing under different marketing channels

(Rs. / tonne)

Particulars	Channel - I Local market	Channel - II Distant market
1. Producers		
a. Gross price received	47,294	-
b. Marketing costs	4,544	-
c. Net price received	42,750	37,346
2. Commission agent–cum-wholesalers		
a. Purchase price	42,750	-
b. Costs		933 -
c. Margins	3,800	-
d. Sale price	47,483	-
3. Pre -harvest contractor		
a. Purchase price	-	37,346
b. Costs	-	7,450
c. Margins	-	6,500
d. Sale price	-	51,296
4. Distant wholesale traders		
a. Purchase price	-	51,296
b. Costs	-	1,413
c. Margins	-	4,327
d. Sale price	-	57,036
5. Retailers		
a. Purchase price	47,483	-
b. Costs		1,587 -
c. Margins	4,400	-
d. Sale price or consumers purchase price	53,470	-
6. Distant Retailers		
a. Purchase price	-	57,036
b. Costs	-	2,435
c. Margins	-	6,150
d. Sale price or consumers purchase price	-	65,621
Price spread	10,720	28,275
Producer's share in consumer's rupee (%)	79.95	56.91
Acharya's Method of Marketing Efficiency	2.8	1.32
Shepherd's method of Marketing Efficiency	3.51	2.32

Marketing efficiency refers to the relationship between output and input while performing marketing function. According to Acharya's method of marketing efficiency, the efficiency in channel-I (2.80) was more efficient than channel-II (1.32). Shepherd's method of marketing efficiency also showed that the marketing efficiency in channel-I (3.51) is greater than channel-II (2.32) which reiterates that channel-I was more efficient than channel-II (Table VI).

The analysis reveals that sweet lime cultivation is economically viable. The informal labour contracts have evolved as an institutional mechanizm to manage pruning and harvesting operations who need to have formal arrangements for long term job security. As a sizeable percentage of the produce is spoilt due to poor handling methods, there is a need to provide infrastructural facilities and capacity building of farmers. Farmers may be encouraged to participate in direct marketing rather than selling through pre-harvest contractors. Networking of farmers would improve their bargaining powers.

References

Acharya, S. S. and Agarwal, N. L., 2011, Agricultural Marketing in India. Oxford and IBH, New Delhi.

Bhat Anil, Jyoti Kachrooa and Dileep Kachroob, 2011, Economic appraisal of kinnow production and its marketing under North-Western Himalayan region of Jammu. *Agric. Econ. Res. Rev.*, **24** (2) : 283 - 290.

Bhat Anil, Jyoti Kachrooa and Singh, S. P., 2014, A study on behaviour of arrivals and prices of citrus in narwal market of Jammu, India. *Indian J. Agric. Res.*, **48** (1) : 23 - 28.

Geeta Verma, P. K., Mahajan and Bharti, 2015, Economic appraisal of kinnow production and its marketing in lower hills of Himachal Pradesh. *Int. J. Farm Sci.*, **5** (1) : 177 - 187.

Manpreet Kaur and Naresh Singla, 2016, An economic analysis of kinnow cultivation and marketing in Fazilka district of Punjab. *Indian J. Econ. Dev.,* **12** (4) : 711 - 718.

(*Received :* Aug., 2017 *Accepted :* Oct., 2017)