Original Research Article

A study on Post-harvest Losses - "Royal Delicious" Variety of Apple in Different Marketing Channels, Seraj Valley, District-Mandi of Himachal Pradesh

Abstract

Aim: To analyse the post-harvest losses occurred in different marketing channels of "Royal delicious" variety of apple.
Study design: The data was collected by using survey method, with the help of questionnaire. The data was collected by interviewing the respondents personally.
Place and Duration of the Study: The present research study was conducted in the year 2022, using a sample of 80 apple growers in the Seraj valley, District – Mandi of Himachal Pradesh.
Methodology: A sample of 80 apple growers (54 marginal, 17 small and 9 semi medium farmers) was taken, and the existing marketing channels (Channel I,II,III) were identified. Channel I (Producer – Primary market retailer – Consumer), Channel II (Producer – Wholesaler – Secondary market retailer – Consumer) and Channel III (Producer – Pre-harvest contractor – Wholesaler – Secondary market retailer – Consumer). A total of 30 market functionaries were selected randomly.
Results: It was revealed that, on an average a total of 12.4% of produce was lost per quintal of produce i.e. 12.4kg/quintal, with Channel III having highest average post-harvest losses 17.4% of produce lost per quintal of produce. In Channel II the average post-harvest losses were found 14.05% loss per quintal of produce. And the Channel I had the minimum post-harvest losses of just 5.75% loss per quintal of produce. In economic terms, an averages loss of Rs. 744/quintal was observed at the price of Rs. 60/kg.
Conclusion: It was concluded that marketing channel III was having highest losses because of more middlemen in the channel and by looking into the channel, at wholesaler level there were having the highest loss. These losses can be minimized by having more cold storage facilities, and quick dispose of produce from producer to consumer.

Keywords: *Malus domestica, Average post-harvest loss, Apple growers, Marketing channels.*

1. INTRODUCTION

Apple (*Malus domestica)* is the 3rd most cultivated fruit in the world, currently China being the leading producer followed by the United state of America, India ranks 5th in the production of the apple. Apple consists of key nutrients in it like fiber, vitamins, minerals and flavonoids which are required in day-to-day life of individuals. Apple is considered good for the heart due to the presence of potassium, quercetin antioxidant provides anti-cancer properties, high fiber content regulates blood sugar.

Apple fruit requires special climatic condition for its production, i.e. it requires chilling period. 'Royal delicious' variety requires normally around 900 hours to 1000 hours of chilling period for a good production, because of these special climatic requirements the apple is mostly grown North Western Indian Himalayan region because of the favourable climatic

conditions. Jammu and Kashmir is the country's leading producer in the apple with alone producing more than 70% of the produce, Himachal Pradesh is second in the production of apple with 26.42% of produce, then followed by Uttarakhand 2.266% production, Arunachal Pradesh with 0.30% and Nagaland with only 0.07% production.

The post-harvest losses of apple are very common because of the high perishable nature and low shelf life. Because of it a portion of produce is lost at different points in the marketing channel i.e. starting from the farm level till it reaches to the ultimate consumers for the consumption. There is always a loss off small portion of produce even if the produce is taken well care off. From the farm level till it reaches to the consumer there are different post-harvest activities that are to be performed like harvesting, handling, storage processing, packaging, transportation and marketing, and to perform these activities different middleman or market functionaries are involved like pre harvest contractor, wholesaler, retailer. And as the produce goes hand to hand from the producer to different market functionaries till it reaches the final consumer, a small portion of it is lost because of high perishable nature. The present study was conducted to analyse the post-harvest losses in different marketing channel of apple, its reasons and to minimise this loss.

2. METHHODOLOGY

Multistage stratified random sampling procedure was adopted for the selection of the sample. In 1st stage, out of the 12 districts in Himachal Pradesh, Mandi district was selected purposely because of its significant contribution with respect to area and production of apple in the state. 2nd stage, out of the 11 blocks, Seraj block was selected purposely on the basis of highest area under apple production, in 3rd stage out of the total 226 villages, 11 villages were selected randomly for the study.

In stage 4th, the respondents were divided into different categories according to their size of the land holding, marginal (less than 1 hectare), small (1-2 hectare), semi medium (2-4 hectares), medium (4-10 hectares), large (mare than 10 hectares). A sample of 10% of apple growers was selected randomly from the selected villages to get a sample of 80 respondents viz. 54 marginal, 17 small and 9 semi medium apple growers respectively, there were no medium and large apple growers in the study area. The district market i.e. Agricultural Produce & Livestock Market Committee (APMC) Mandi was selected in the 5th stage.

In the 6th stage the market functionaries were selected randomly from the selected market, the survey method was adopted for collecting data of post-harvest loss in apple. The data was collected from personal visits interviewing the selected respondents and intermediaries in the marketing of apple.

2.1 Analytical technique

Post-harvest losses were assessed as

1) Average physical post-harvest losses (in kg).

2) Economical post-harvest losses (in Rupees).

3. RESULTS AND DISCUSSION

3.1 Identifying marketing channels

The movement of produce from the producer to the ultimate consumer is marketing and this process is performed by different market intermediaries or market functionaries. The produce passes from one functionary to the other in the form of chain, this chain is defined as marketing channel. The following marketing channels identified in the study area**.**

Channel I: (Producer - Primary market retailer - Consumer).

Channel II: (Producer – Wholesaler - Secondary market retailer - Consumer).

Channel III: (Producer – Pre-harvest contractor – Wholesaler - Secondary market retailer - Consumer).

Table 1. Adopted marketing channels by the sampled apple growers.

S.I No.	Farm category	Marketing Channels			Total
		I	II	III	
1.	Marginal	8	40	6	54
2.	Small	2	12	3	17
3.	Semi medium	1	7	1	9
	Overall	11	59	10	80

Table 1: shows the marketing channels adopted by sampled apple growers in the study area, as shown a majority of 59 apple growers adopted Channel II (Producer-Wholesaler-Secondary market retailer-Consumer), followed by Channel I (11 apple growers), and Channel III (10 apple growers).

3.2 Average post-harvest losses in different marketing channels

Channel I: (Producer – Primary market retailer – Consumer)

Table 2. Average Physical post-harvest losses in Channel I.

S.I. No.	Particulars	Losses in Kg/quintal
(a)	At Producer level	
1.	Immature harvest	0.6
2.	Physiological	0.3
3.	Disease	0.5
4.	Lack of storage	0.25
5.	Harvesting injuries	0.5
	Total losses at farm level	2.15
(b)	At Retailer level	
1.	Physically damage	0.75
2.	Rotten	0.4
3.	Lack of storage	1.6
4.	Transportation loss	0.85
	Total losses at retailer level	3.6
(c)	**Total average post-harvest loss in Channel I**	5.75

Table 2: shows the average physical post-harvest losses of apple in Channel I, an average of 5.75% i.e. 5.75 kg/quintal of produce was lost in Channel I. In channel I average loss at producer level was 2.15 kg/quintal and at retailer level the average loss was 3.6 kg/quintal of produce.

Channel II: (Producer – Wholesaler – Secondary market retailer – Consumer)

Table 3. Average physical post-harvest losses in Channel II.

S.I. No.	Particulars	Losses in Kg/quintal
(a)	At Producer level	
1.	Immature harvest	0.6
2.	Physiological	0.45
3.	Disease	0.5
4.	Lack of storage	0.7
5.	Harvesting injuries	0.5
	Total losses at farm level	2.75
(b)	At Wholesaler level	
1.	Physically damage	4.5
2.	Rotten	0.8
3.	Lack of storage	1.45
4.	Transportation loss	0.75
	Total losses at Wholesaler level	7.5
(c)	At Retailer level	
1.	Physically damage	0.75
2.	Rotten	0.6
3.	Lack of storage	1.6
4.	Transportation loss	0.85
	Total losses at retailer level	3.8
(d)	**Total average post-harvest loss in Channel II**	14.05

Table 3: shows the average post-harvest losses in channel II, an average loss of 14.05% per quintal of produce occurs in channel II i.e. 14.05 kg/quintal loss. In channel II the average loss at producer level was lowest i.e. 2.75 kg/quintal of produce, at wholesaler level it was highest i.e. 7.5 kg/quintal of produce and at retailer level the average post-harvest loss was 3.8 kg/quintal of produce.

Channel III: (Producer – Pre harvest contractor – Wholesaler – Secondary market retailer – Consumer)

Table 4. Average Physical post-harvest losses in Channel III.

S.I. No.	Particulars	Losses in kg/quintal
(a)	At Producer level	
1.	Immature harvest	0.65
2.	Physiological	0.3
3.	Disease	0.5
4.	Lack of storage	0.3
5.	Harvesting injuries	0.5
	Total losses at farm level	2.25
(b)	At pre-harvest contractor level	
1.	Lack of storage	1.5
2.	Physical damage	0.45
3.	Rotten fruits	0.25
4.	Spoilage	0.5
	Total losses at pre harvest contractor level	2.7
(c)	At Wholesaler level	
1.	Physically damage	4.7
2.	Rotten	1.2
3.	Lack of storage	1.6
4.	Transportation loss	0.75
	Total losses at Wholesaler level	8.25

(d)	At Retailer level	
1.	Physically damage	1.4
2.	Rotten	0.5
3.	Lack of storage	1.7
4.	Transportation loss	0.6
	Total losses at retailer level	4.2
(e)	**Total average post-harvest loss in Channel III**	17.4

Table 4: shows the average post-harvest losses in Channel III, an average loss of 17.4% per quintal of produce occurs in channel III i.e. 17.4 kg/quintal loss. In channel III the average loss at producer level was lowest i.e. 2.25 kg/quintal and was highest at wholesaler level i.e. 8.25 kg/quintal of produce was lost. At Pre-harvest contractor level a loss of 2.7 kg/quintal of produce occurred and a loss of 4.2 kg/quintal at retailer level.

3.3 Average post-harvest losses in apple (physical & economical) in different marketing channels.

Table 5. Average post-harvest losses in apple (physical & economical) in different marketing channels.

S.I. No.	Different levels	Marketing Channels			Sample average	Losses in economic terms (At Rs. 60/kg)
		I	II	III		
1.	Producer level	2.15	2.75	2.25	2.38	143
2.	Pre harvest contractor level	-	-	2.7	2.7	160
3.	Wholesaler level	-	7.5	8.25	7.9	474
4.	Retailer level	3.6	3.8	4.2	3.85	231
	Total	5.75	14.05	17.4	12.4	744

Table 5: shows the average post-harvest losses in apple (physical & economical) in different marketing channels, the highest losses occur in Channel III i.e. 17.4 kg/quintal of produce, followed by the Channel II with 14.05 kg/quintal of produce and lowest in Channel I with only 5.75 kg/quintal of produce. On average at wholesaler level was having highest loss i.e. 7.9 kg/quintal of produce and the loss was lowest at producer level i.e. only 2.38 kg/quintal of produce. In economic terms, the average total loss was Rs. 744 per quintal of produce at the rate of Rs. 60/kg, looking at different farm levels the highest loss occurred at wholesaler level with Rs. 474 loss per quintal of produce and was lowest for producer level with Rs. 143/ quintal. And Rs 160/quintal, Rs. 231/quintal for Pre harvest contractor and retailer level.

4. CONCLUSION

The post-harvest losses in different marketing channel in the study area, was found that the average post-harvest loss was about 12.4 kg/quintal of produce which was calculated about Rs. 744 per quintal of produce. Channel III was having highest (17.4kg/quintal) post-harvest losses which, followed by channel II (14.05 kg/quintal) and then lowest in channel I (5.75 kg/quintal). At different farm levels, wholesaler was having highest average post-harvest loss (7.9 kg/quintal) which was about Rs. 474 per quintal of produce, followed by retailer level (3.85kg/quintal, Rs. 231 per quintal of produce), then pre-harvest contractor level (2.7 kg/quintal, Rs. 160 per quintal of produce, and producer level (2.38 kg/quintal, Rs. 143 per quintal of produce).

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