

ECONOMICS OF STORAGE OF ONION IN SIKAR DISTRICT OF RAJASTHAN

SWATI SHARMA¹ & RUCHIRA SHUKLA²

¹Assistant Professor, ASPEE Agribusiness Management Institute, Navsari Agricultural University, Navsari, Gujarat, India

²Associate Professor, ASPEE Agribusiness Management Institute, Navsari Agricultural University, Navsari, Gujarat, India

ABSTRACT

A study was undertaken to examine the economics of storage in onion supply chain in the Sikar district which is one of the major onion growing district of Rajasthan. A total sample size of 75 onion growers was taken from Sikar district. In Sikar district generally farmer's store onion in storage (under ambient conditions) in the months April to September every year after harvesting the onion crop. The out of the total quantity of marketed surplus (11595.20q), 3556.25q onion produce was stored by the onion growers (30.67 per cent) in onion storage at farm level by the sample farmers during April to September, 2011 period at different locations in Sikar district. 15.96% of onion is lost during storage period owing to post harvest losses. Maximum return from onion marketing was received during September month (36.01%) due to shortage of produce in market. An overall average profit of 12.82% was obtained by onion growers during six months storage period. The major reasons for storing onion by farmers were for home consumption (95.7%) and to reap benefits of higher prices (91.3%). Majority of farmers (65.2%) adopted improved methods of storage. About 91.3% farmers reported that lack of knowledge about proper scientific methods for storage of onion was the major problem faced by farmers.

KEYWORDS: Storage, Onion, Economics

INTRODUCTION

An onion, today being compared with diamonds indicates its value for a normal household budget. A global review states that China is the first in area and production while India occupies second position in the production and exports to Dubai, Kuwait, Saudi Arabia, Middle East, Malaysia, Singapore, Bangladesh, Sri Lanka etc. Onion is an important commercial vegetable crop. About 82.02 million tonnes onion is produced in the world from 8217 thousand hectares of area. India is one of the major onions producing country with a production of 14.84 million tonnes from an area of 1.01 million hectares.

Onion is one of the most important commercial vegetable crops grown in Rajasthan. It occupies about 25 -30% area of the total vegetable crops in the state. It is predominantly a rabi season crop but in kharif season it accounts for about 10 -15% of the total production. Rajasthan has a comparative advantage in onion production. In the total area and production in the country, Rajasthan stands 7th position in area and production and productivity in India and contributes about 57.46('000 ha) in area and 704.96 (in '000 MT) in production (NHB, 2013-14).

Storage is one of the important aspects for post harvest handling of onion. The storage condition extends the period of availability of fresh onion by arresting the metabolic breakdown and decay. In India, currently about 35- 40 % of the onion is estimated to be lost as postharvest losses during various post- harvest operations including handling and

storage, V. Anbukkarasi et al.(2013). Despite the achievement in production technology and availability of good varieties of onion, the post harvest losses during storage is still an ailing cause which leads to significant qualitative and quantitative losses during storage up to 25-30 %. The onion postharvest losses estimated worth Rs 600 crores were found to be due to desiccation, decay and sprouting (Kukanoor, 2005). The rationale behind such post-harvest losses till today is the unavailability of good storage facilities during post-harvest storage phase. Their seems a big gap between the storage facility and the storage capacity which is ultimately leading to the unforeseeable post- harvest decay and deterioration of onion bulbs. The cold store capacity for fruits and vegetables in India is over 300 lakh million tonnes, out of which most of the cold storage facilities are used for storage of onion and potato. Post harvest losses in onion are approximately Rs 1000 crores annually due to desiccation, decay, and sprouting etc. (ASSOCHAM, 2012) V. Anbukkarasi et al. (2013) reported that during off-season the efficient storage facility for onion plays an important role for the consumers as well as for the producers which ultimately prevents serious losses due to rotting and sprouting.

A study was undertaken in Sikar district to know the pattern of storage adopted by onion farmers. The study also aimed to carryout economic analysis of costs and returns to onion farmers from storage. Also it aimed to throw light on reasons for storage and problem faced by onion farmers in storage.

RESEARCH METHODOLOGY

The study was carried out in the Sikar district of Rajasthan. The methodology for collection of primary data involved structured interview schedule using personal interview method. A structured schedule was prepared for collection of data from 75 onion farmers from district for the fulfillment of objectives. Multistage stage sampling was adopted: At first stage, only highest onion producing 3 tehsils were selected in district. At second stage 3-4 villages were randomly selected for the purpose of primary data collection in district. At third stage the list of the onion growers along with their operational holdings in each of the randomly selected village was prepared with the help of villagers. From this prepared list of onion growers, 7-8 onion growers were randomly selected from each village for the present study. A total sample of seventy five onion growers from ten villages was selected from district. Data obtained from the survey was analyzed through tabular analysis including appropriate statistical tools.

RESULTS AND DISCUSSIONS

An Economic Analysis of Storage of Onion in Sikar District

Results of study of economics of the storage of onion in Sikar district depicted that out of the total quantity of marketed surplus (11595.20q), 3556.25q onion produce was stored by the onion growers (30.67 per cent) in onion storage at farm level by the sample farmers during April to September, 2011 period at different locations (Table 1).

Table 1: Average Production, Marketable and Marketed Surplus and Stored Quantity of Onion

Total Onion Production by Selected Farmers (Q)	Losses in Total Production at Farm Level (q)	Total Marketable Bulbs (q)	Onion Kept for Own Used (q)	Total Marketed Surplus (q)	Quantity of Produce Sold Within One Month (q)	Share of Farmer's Sold Produce Within One Month Period (%)	Total Quantity Stored for Storage (q)	Share of Farmer's Stored Produce in Onion Storage (%)
13584.72	1423.52	12161.20	566.00	11595.20	8038.95	69.33	3556.25	30.67

From the Table 2 the results of the study further revealed that out of the total stored quantity in onion storage (3556.25q), 21.74, 39.13, 17.39, 13.04 and 8.70 per cent stored onion in storage was sold in May, June, July, August and September months, respectively by the farmers. Also it could be inferred from the Table 2 that during storage period, 8.0,

12, 21, 25.0 and 30.0 per cent post harvest losses were observed in May, June, July, August, and September months, respectively. During storage of onion for different periods, marketable yield 92.0, 88, 79.0, 75.0 and 70.0 per cent was recorded for marketing in May, June, July, August and September, months, respectively. It can be seen from the Table 2 that overall average of the stored onion in the storage, in total 15.96 per cent post harvest losses (weight loss, sprouting and rotting) was obtained during 6 months storage period and 84.04 percent produce (2988.79) was only recover after storage of onion for marketing purpose.

Table 2: Pattern of Onion Storage, Sale and Post Harvest Losses during Storage at Farm Level in Sikar

Storage Period of Onion At Farm Level	Sikar#		
	Quantity of Stored (q)	Quantity Sold After Storage (q)	Quantity in Post Harvest Losses (q)
Total quantity of onion produce stored by the selected farmers at farm level	3556.25# (100.00)	-	-
Store for 1 month (April-May)	773.13 (21.74)	711.28 (0.92)	61.85 (8.00)
Store for 2 month (May-June)	1391.56 (39.13)	1224.57 (0.88)	166.83 (12.00)
Store for 3 months (May-July)	618.43 (17.39)	488.56 (0.79)	129.87 (21.00)
Store for 4 months (May-Aug)	463.74 (13.04)	347.81 (0.75)	115.93 (25.00)
Store for 5 months (May-Sep)	309.39 (8.70)	216.57 (0.70)	92.82 (30.00)
Store for 6 months (May-Oct)	-	-	-
Quantity sale out after storage by the selected farmers	-	2988.79 (84.04)	-
Quantity of onion in post harvest losses (Decay, Sprouting and Weight loss) during storage	-	-	567.46 (15.96)

Figures within the Parentheses are the Percentages. # in Sikar Farmers Stored Onion from April to Sept

Results further exhibited that all of the onion producers in the Sikar districts sold their maximum percentage of the stored onion after the completion of storage period of two months (39.13%) and minimum percentage of stored onion was sold after six month storage period (8.70%). Sikar onion producers not stored onion beyond six months period (September month) due to heavy post harvest losses after that period. It is depicted from the results that onion growers preferred to sell maximum quantity of stored onion (91.30%) up to the August month in Sikar district. Borole *et al* 2013 also reported similar trend in Maharashtra.

Analysis of economics of onion storage on the basis of per quintal storage of onion was worked out on the basis of the information's received by the farmers during survey (Table 3). Results revealed that expenditure cost for storage of onion in Sikar district ranged from Rs.21.43/q (May) to Rs.46.35/q (September), which includes amount paid for laboures for sorting and grading, depreciation cost of storage and annual simple interest on basic value. Also, the analysis of economics of onion storage on the basis of per quintal storage of onion also showed that after two months storage of onion (April-may), net profit per quintal from marketing of onion was received Rs. 24.57 (5.34%).

However, in subsequent months June, July, August and September months', net profit was received Rs.47.14 (10.24%), Rs. 89.86 (19.23%), Rs. 131.23 (28.53%) and Rs. 165.65 (36.01%), respectively (Table. 3). Results showed that a maximum return from onion marketing was recorded in September month (36.01%). In September month in Sikar district, there was shortage of arrival of onion in the market from within and outside of the states, which create a significant gap in demand and supply of onion in the Sikar market. Therefore, marketing of stored onion from the onion growers in this period earned maximum return in Sikar district.

Table 3: Cost and Returns from Storage of Onion in Sikar District (Rs. /q)

Period of Storage	Cost (Rs.)			Storage Losses (%)	Net sale Quantity (q)	Sale Price (Rs./q)	Gross Income (Rs.)	Profit (Rs.)	Net Profit Realized (%)
	Labour Charges	Interest	Total						
April	0.00	0.00	0.00	0	1.00	460	460.00	0.00	0.00
Apr-May	9.60	3.83	21.43#	8	0.92	550	506.00	24.57	5.34
Apr-June	9.60	7.66	25.26	12	0.88	605	532.40	47.14	10.24
Apr-July	19.20*	11.49	38.69	21	0.79	745	588.55	89.86	19.23
Apr-Aug	19.20	15.32	42.52	25	0.75	845	633.75	131.23	28.53
Apr-Sep	19.20	19.15	46.35	30	0.70	960	672.00	165.65	36.01

*Two sorting are required for storage beyond July; # includes storage cost of Rs. 8.0/q; Storage losses: Quantity of drying + sprouting + storage rots of bulbs.

Study further revealed that net profit earned from the onion growers ranged from 10 to 46.08 per cent (Table 4). Average higher returns 10, 15.74, 27.95, 37.78 and 46.08 per cent were earned by 21.74, 39.13, 17.39, 13.04 and 8.70 per cent of the onion growers, respectively from the storage of onion from June to October months. Study also showed that on an average 12.82 per cent net profit was received by the onion growers from the storage of produce during six months storage period. Analysis also revealed that each onion grower on an average earned Rs. 7112.84, Rs. 11194.14, Rs. 19874.85, Rs. 26859.68 and Rs. 32793.90 by the sale of stored produce in June, July, August, September and October month, respectively. However, overall average net profit of each onion grower for the six months storage was estimated as Rs. **9117.51** in Sikar.

Table 4: Net Profit from the Storage of Onion in Sikar

Storage Period of Onion at Farm Level	Sikar#		
	Sample Farmers Benefited (%)	Net Profit (%)	Net Profit Per Sample Farmer (Rs.)
One month (May- June)	-	-	-
Two month (May-June)	21.74	10.00	7112.84
Three months (May-July)	39.13	15.74	11194.14
Four months (May-Aug)	17.39	27.95	19874.85
Five months (May-Sep)	13.04	37.78	26859.68
Six months (May-Oct)	8.70	46.08	32793.90
Overall Average	23 (100.00)	12.82	9117.51

#Sikar district farmers stored onion from April to September months.

From the Table 5 it could be concluded that overall average per quintal profit of sample farmers during six months storage period was maximum in the period May-September (36.01%) followed by May-August (28.53%) and lowest in months of May (5.34%) in the study area.

Table 5: Overall Average per Quintal Profit of Sample Farmers (%) During Six Months Storage Period in Sikar

Total Number of Sample Farmers Not Adopted Storage Practice	Total Number of Sample Farmers Adopted Storage Practice	Profit in Storage of Onion (Rs./q)						
		May	May-June	May-July	May-Aug	May-Sep	May-Oct	June-Nov
52 (69.33)	23 (30.67)	24.57 (5.34)	47.14 (10.24)	89.86 (19.23)	131.23 (28.53)	165.65 (36.01)	-	-

Note: Figures within the parenthesis are the percentage of total.

Further from the Table 6 it could be concluded that 30.67% sample farmers adopted storage of onion in Sikar district and per quintal average profit from storage of onion during six months period was observed Rs. 76.41 (16.61%). Overall average profit of each sample farmer from onion storage was found to be Rs. 91117.51 (12.82%).

Table 6: Overall Average Profit of Onion Farmer from Sale of Stored Onion

Total Sample Farmers Storage Onion (%)	Per Quintal Average Profit From Storage of Onion During Six Months Period (Rs.)	Per Quintal Average Profit From Storage of Onion During Six Months Period (%)	Overall Average Profit of Each Sample Farmer From Onion Storage (Rs.)	Overall Average Profit of Sample Farmer From Onion Storage (%)
30.67	76.41	16.61	91117.51	12.82

It can be seen from Table 7 that the major reason for storing onion by farmers were for home consumption(95.7%) to reap benefits of higher prices (91.3%), followed by seed production(60.9%) and (30.4%) reported the non-availability of time to dispose of produce after harvest as one of the reason for onion storage in Sikar district. Regarding advantages of storing onion, 86.9% farmers stated higher price realized in off season selling and 8.7% told that it protects against decline in prices. About 13% farmers reported that they spread onion on kuccha floor for storing, 34.8% farmers spread onion on pucca floor and rest 52.2% farmers spread onion on bamboo or wooden mats.

Table 7: Reasons for Storing Onion by the Farmers

S. No	Particulars	Sikar
		Proportions of Sample Farmers (N=23)
A.	Reasons for storing onion	
1.	Top reap benefits of higher prices	91.3
2.	For home consumption	95.7
3.	For seed production	60.9
3.	Non-availability of time to dispose of produce after harvest	30.4
B.	Advantage of storing onion	
1.	Higher price realized	86.9
2.	Protection against decline in prices	8.7
C.	Storage pattern	
1.	Spreading on Kuccha floor	13.0
2.	Spreading on pucca floor	34.8
3.	Spreading on bamboo / wooden mats	52.2
	Method of storage	
a.	Traditional	34.8
1..	Keep bulbs in storage by heap method	37.5
2.	Keep bulbs on bamboo structure for proper wreaths & storage of long duration	62.5
b.	Improved	65.2
1.	Local technology developed by farmers	86.7
2.	Technology developed by DOGR, Pune / NHRDF, Nashik	13.3
D	Causes of storage losses	
1.	Losses of the onion from wreaths	47.8
2.	Decaying in storage	30.4
3.	Sprouting of onion bulbs	21.7
4.	Inadequate space for storing of onion	43.5
5.	Lack of knowledge about proper scientific methods for storage of onion	91.3

In Sikar district traditional method of storage was adopted by 34.8% farmers among which 37.5% kept bulbs by heap method and rest 62.5% kept bulbs on bamboo structure to store onion for long duration. While 65.2% farmers adopted improved method of onion storage out of which 86.7% adopted local technology developed at farm level and rest 13.3% adopted the technology developed by DOGR, Pune/ NHRDF, Nashik. In Sikar district 91.3% farmers reported that lack of knowledge about proper scientific methods for onion storage one of the key problems resulting in high losses at farm level storage. 47.8% sample farmer reported losses of onion from wreaths as major cause of storage losses. The 43.5% farmers considered inadequate space for onion storing as key hindrance, about 21.7% farmers considered sprouting and 30.4% farmers reported decay as major problems causing storage losses.

CONCLUSIONS

The study concludes that onion storage at farm level on an average gives 12.82% profit to onion growers during six month storage. Highest returns can be obtained by storing up to the month of September. Also, the major reasons for storing onion by farmers were for the home consumption and to reap benefits of higher prices. However lack of knowledge about proper scientific methods for onion storage is one of the key problems leading to high losses at farm level storage. Therefore, there is an urgent need of training the onion growers on scientific techniques for storing onion at farm level, if the vegetable production is to be sustained on a profitable basis in the region. Appropriate farm level storage needs to be given due attention for reducing post harvest losses.

REFERENCES

1. Anbukkarasi V., Paramaguru P., Pugalandhi L., Ragupathi N. and Jeyakumar P., 2013, Studies on pre and post-harvest treatments for extending shelf life in onion A review, Agricultural research communication centre., 34 (4) : 256-268.
2. ASSOCHAM database- 2012
3. Borole Seema T., Burbade Rajesh, Shinde Anil, 2013 Comparative Losses and Economic Feasibility of the Improved Onion Storage with Low Cost of Onion Storage Structure, International Journal of Modern Engineering Research (IJMER), Vol. 3, Issue. 5, Sep - Oct. 2013 pp-2656-2661
4. Kukanoor, 2005, Post harvest studies in onion Cv.N-53. PhD. University of Agriculture sciences, Dhawan
5. National Horticulture Board database- 2013-14
6. Pandey, U.B., 1989, Problems in post- harvest handling of onion and current status of research work done by AADF in the field of post-harvest technology. AADF News Letter, 9(3 & 4): 12-15.
7. Ranpise, S.A., R.M. Birade, B.T. Patil and S.V. Swant., 2001, Factors affecting the storage of onion: A review. Orissa Journal of Horticulture, 29(1): 1-12