Journal of AgriSearch, 7(2):86-92
An Open Access International Peer Reviewed Quarterly
ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v6i02.18103

Performance Studies on Storage of White Onion for Good Keeping Quality Onion Varieties under Ordinary Condition

RK SINGH[1*], SK SINGH[2] AND AK TAILOR[3]

ARTICLE INFO

Received on	:	05-03-2020
Accepted on	:	28-05-2020
Published online	:	10-06-2020

ABSTRACT

Onion is commercially cultivated and widely consumed as a vegetable and as spices in India. Post-harvest factors like curing, sorting, grading, packing, storage and transportation are, however, the main factors affecting the quality. The experiment conducted at Nashik and Karnal during *Rabi* seasons, revealed that at Nashik the lowest PLW (19.17 %) and total loss (29.69 %) were recorded in advance line-865 and 799, respectively, which was at par with advance lines-784, 810, 827, 885 and 857 in respect of PLW and advance lines-827, 865 and 857 regarding total loss. However, at Karnal the lowest PLW (32.24 %) and total loss (48.40 %) were recorded in advance line-793 and was at par with advance lines-784, 810, 827, 830, 832, 836 and 869 in respect of PLW and advance lines-562, 784, 810, 827, 830, 832 and 836 regarding total loss at five month after storage. It is concluded that the onion genotypes, which has recorded minimum total losses after five months of storage, can be utilized for developing a good keeping quality onion variety for the different agro climatic condition.

KEYWORDS

Onion, genotypes, storage, periodical losses, storability

INTRODUCTION

Onion (*Allium cepa* L.) is an important spices vegetable consumed by all masses throughout the year (Singh and Singh, 2019). It also has high export potential and comes under cash crop apart from vegetables (Pandey, 1989). About 73.23 million tons of onions are produced in the world from 3.65 million ha area. India, being a major onion producing country, produces 20.13 million tons from 1.19 million ha, with very low productivity of 16.24 t/ha. India is the second-largest producer of onion in the world after China. It is used as a salad or cooked in various ways in all curries, fried or baked. The nutritive value of onion varies from varieties to varieties. India is one of the major onion growing countries in the world and exporting good quantities of fresh as well as processed onion to many of the countries (Gupta *et al.*, 2019). Processed onion, highly competitive commodity in the international market should possess certain desirable traits such as high yield retentive attractive colour, high pungency and good drying ratio (Kurade and Mathias, 1972). The main white onion growing states in India are Maharashtra, Gujarat, Karnataka and Madhya Pradesh (Singh and Singh, 2019). Mainly its use in processed form, e.g. flakes powder, paste, crush and pickle, etc. (Singh *et al.*, 2004) and has many medicinal properties. The production of white onion is now becoming popular among farmers, producers and exporter. The exporters export the white onion from Maharashtra and Gujarat and they are demanding an excellent white onion variety which has greater potential for dehydration. The work conducted on white onion variety development is very scanty (Saimbhi *et al.*, 1971 and Sethi *et al.*, 1993). So, it is essential to develop high yield potential, processing and good storage quality varieties. In storage, a substantial loss noted due to sprouting and decay and these losses vary from 5-85% depending upon the variety and weather conditions (Warade *et al.*, 1998). The effect of various cultural practices though is not very clear but some of the operations like soil, irrigation, nitrogen, potash application, and chemical application, time of harvesting and stage of maturity while harvesting does affect post-harvest losses. Onion is semi-perishable and subjected to deterioration during storage, transportation and marketing. Therefore, for an increase in self-life of the bulb without degradations of their quality, the efforts were made to develop white onion cultivar, especially for good horticultural traits, yield, processing and good keeping quality.

MATERIALS AND METHODS

The present experiment was carried out at National Horticultural Research and Development Foundation Nashik (20^0 N latitude and 73^0 E longitudes and altitude of 492.0 meter above mean sea level), Maharashtra and Karnal Haryana during *Rabi*, 2017-18. The soil of the experimental block was clay loam, medium in organic carbon (0.58%), available nitrogen (385.2 kg/ha), phosphorus (45.13 kg/ha) and high in available potash (291.2 kg/ha). The climate of Nashik is sub-tropical with minimum and maximum temperature and humidity ranging between 10 to 45^{0}C and 48%, respectively with an annual rainfall around 881 mm. A total of 17 genotypes along with one check Agri found white were kept in storage under ambient conditions at Nashik and 14 genotypes along with one check at Karnal. Harvesting was done at one week after 50-60% neck fall stage and after proper field curing and neck cutting, the well cured and representative bulbs of each advance lines were kept for storage on 15/05/2018 at Nashik, however at Karnal on 07/06/2018 under ambient conditions in perforated plastic crates in randomized

[1]Asso. Prof., Deptt. of Vegetable Science, Banda University of Agriculture and Technology, Banda, UP, India
[2]Deputy Director, National Horticultural Research and Development foundation, New Delhi, India
[3]Technical Officer (Horticulture), National Horticultural Research and Development foundation, Nashik, Maharashtra
*Corresponding author email : singhrknbpgr@gmail.com

block design with three replications for five months to identify good keeping quality genotypes. The observations on storage losses due to sprouting, physiological loss of weight (PLW), rotting and total loss were recorded at monthly intervals. The analyzed data obtained during the storage period are presented in Table 1 & 2 for Nashik and Karnal, respectively.

RESULTS AND DISCUSSION

Performance evaluation at Nashik

The data of pertaining to Nashik has been presented in Table 1 to 5.

Storage performance of after one month of storage at Nashik

Highest gross yield (382.13 qt/ha) and marketable yield (250.47 qt/ha) were recorded in advance line-874 and found at par with advance line-827 in respect of marketable yield. After one month of storage, no sprouting and decay loss was recorded in all the advance lines. Lowest PLW and total loss (2.37 %) were recorded in advance line-784 and were at par with all advance lines except advance lines-874, 885 and 886 (Table 1).

Table 1: Storage performance of white onion advance lines after one month of storage at Nashik

Lines	Gross yield q/ha	Marketable Yield q/ha	Sprouting %		Decay Loss %		PLW %		Total Loss %	
L-562	278.87	193.31	0.00	(0.71)	0.00	(0.71)	4.80	(2.26)	4.80	(2.26)
L-784	217.84	132.06	0.00	(0.71)	0.00	(0.71)	2.37	(1.69)	2.37	(1.69)
L-793	208.57	176.21	0.00	(0.71)	0.00	(0.71)	4.02	(2.12)	4.02	(2.12)
L-799	292.16	189.49	0.00	(0.71)	0.00	(0.71)	3.97	(2.09)	3.97	(2.09)
L-810	313.98	190.37	0.00	(0.71)	0.00	(0.71)	4.33	(2.19)	4.33	(2.19)
L-823	197.51	115.79	0.00	(0.71)	0.00	(0.71)	4.32	(2.19)	4.32	(2.19)
L-827	298.73	229.76	0.00	(0.71)	0.00	(0.71)	3.92	(2.10)	3.92	(2.10)
L-830	232.08	140.88	0.00	(0.71)	0.00	(0.71)	4.05	(2.12)	4.05	(2.12)
L-832	315.26	189.60	0.00	(0.71)	0.00	(0.71)	3.07	(1.81)	3.07	(1.81)
L-836	244.33	163.54	0.00	(0.71)	0.00	(0.71)	3.91	(2.09)	3.91	(2.09)
L-842	244.69	162.15	0.00	(0.71)	0.00	(0.71)	4.47	(2.20)	4.47	(2.20)
L-865	245.86	157.88	0.00	(0.71)	0.00	(0.71)	3.01	(1.86)	3.01	(1.86)
L-869	249.00	156.34	0.00	(0.71)	0.00	(0.71)	4.03	(2.11)	4.03	(2.11)
L-874	382.13	250.47	0.00	(0.71)	0.00	(0.71)	5.08	(2.36)	5.08	(2.36)
L-885	203.72	160.91	0.00	(0.71)	0.00	(0.71)	6.69	(2.67)	6.69	(2.67)
L-886	260.71	188.21	0.00	(0.71)	0.00	(0.71)	10.85	(3.29)	10.85	(3.29)
L-857	288.84	218.58	0.00	(0.71)	0.00	(0.71)	3.63	(2.03)	3.63	(2.03)
Agrifound white (C)	244.37	185.52	0.00	(0.71)	0.00	(0.71)	3.07	(1.89)	3.07	(1.89)
CD at± 5%	**41.76**	**29.41**	**-**	**-**	**-**	**-**	**-**	**0.59**	**-**	**0.59**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after two months of storage at Nashik

After two months of storage, nil sprouting and decay loss were recorded in all the advance lines. Lowest PLW and total loss (4.02 %) were recorded in advance line-784 and found at par with all advance lines except lines-793, 842, 869, 874, 885 and 886 (Table 2).

Table 2: Storage performance of white onion advance lines after two months of storage at Nashik

Lines	Sprouting %		Decay Loss %		PLW %		Total Loss %	
L-562	0.00	(0.71)	0.00	(0.71)	4.80	(2.22)	4.80	(2.22)
L-784	0.00	(0.71)	0.00	(0.71)	4.02	(2.12)	4.02	(2.12)
L-793	0.00	(0.71)	0.00	(0.71)	11.02	(3.34)	11.02	(3.34)
L-799	0.00	(0.71)	0.00	(0.71)	5.88	(2.51)	5.88	(2.51)
L-810	0.00	(0.71)	0.00	(0.71)	5.53	(2.45)	5.53	(2.45)
L-823	0.00	(0.71)	0.00	(0.71)	6.07	(2.55)	6.07	(2.55)
L-827	0.00	(0.71)	0.00	(0.71)	6.52	(2.60)	6.52	(2.60)
L-830	0.00	(0.71)	0.00	(0.71)	5.97	(2.52)	5.97	(2.52)
L-832	0.00	(0.71)	0.00	(0.71)	4.60	(2.21)	4.60	(2.21)
L-836	0.00	(0.71)	0.00	(0.71)	6.48	(2.63)	6.48	(2.63)

L-842	0.00	(0.71)	0.00	(0.71)	8.23	(2.94)	8.23	(2.94)
L-865	0.00	(0.71)	0.00	(0.71)	6.00	(2.53)	6.00	(2.53)
L-869	0.00	(0.71)	0.00	(0.71)	8.31	(2.96)	8.31	(2.96)
L-874	0.00	(0.71)	0.00	(0.71)	7.65	(2.85)	7.65	(2.85)
L-885	0.00	(0.71)	0.00	(0.71)	9.53	(3.16)	9.53	(3.16)
L-886	0.00	(0.71)	0.00	(0.71)	14.67	(3.89)	14.67	(3.89)
L-857	0.00	(0.71)	0.00	(0.71)	6.76	(2.69)	6.76	(2.69)
Agrifound white (C)	0.00	(0.71)	0.00	(0.71)	4.28	(2.18)	4.28	(2.18)
CD at± 5%	**-**	**-**	**-**	**-**	**-**	**0.65**	**-**	**0.65**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after three months of storage at Nashik

After three months of storage, no sprouting were recorded in advance line-827 and 886 and found at par with advance line-869. No decay loss was recorded in advance lines-784, 793, 799, 810, 832, 836 and 886 and found at par with advance lines-830, 842, 874 and 857. Lowest PLW (10.33 %) and total loss (11.66 %) were recorded in advance line-784 and found at par with advance line-799, 827, 830, 832, 836, 865, 857 and check variety Agrifound White (Table 3).

Table 3: Storage performance of white onion advance lines after three months of storage at Nashik

Lines	Sprouting %		Decay Loss %		PLW %		Total Loss %	
L-562	0.85	(1.16)	4.62	(2.24)	16.18	(4.06)	21.65	(4.70)
L-784	1.32	(1.34)	0.00	(0.71)	10.33	(3.29)	11.66	(3.49)
L-793	1.43	(1.39)	0.00	(0.71)	20.29	(4.48)	21.72	(4.64)
L-799	0.51	(1.01)	0.00	(0.71)	12.82	(3.63)	13.33	(3.70)
L-810	1.58	(1.43)	0.00	(0.71)	15.53	(4.00)	17.11	(4.20)
L-823	0.80	(1.14)	0.63	(1.06)	17.80	(4.27)	19.23	(4.44)
L-827	0.00	(0.71)	0.60	(1.05)	14.23	(3.83)	14.83	(3.91)
L-830	0.69	(1.09)	0.24	(0.84)	12.92	(3.66)	13.85	(3.79)
L-832	0.98	(1.22)	0.00	(0.71)	14.64	(3.87)	15.62	(4.00)
L-836	0.72	(1.10)	0.00	(0.71)	12.98	(3.67)	13.70	(3.76)
L-842	0.93	(1.20)	0.35	(0.92)	16.35	(4.10)	17.63	(4.26)
L-865	1.05	(1.24)	0.59	(1.02)	11.80	(3.51)	13.44	(3.73)
L-869	0.35	(0.92)	0.42	(0.96)	17.23	(4.20)	18.00	(4.29)
L-874	1.57	(1.44)	0.38	(0.93)	19.98	(4.52)	21.92	(4.73)
L-885	0.67	(1.05)	0.75	(1.11)	15.47	(4.00)	16.89	(4.17)
L-886	0.00	(0.71)	0.00	(0.71)	23.82	(4.89)	23.82	(4.89)
L-857	0.77	(1.09)	0.28	(0.88)	14.01	(3.81)	15.07	(3.94)
Agrifound white (C)	1.60	(1.43)	0.53	(0.99)	12.36	(3.58)	14.49	(3.87)
CD at ± 5%	**-**	**0.24**	**-**	**0.24**	**-**	**0.65**	**-**	**0.61**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after four months of storage at Nashik

After four months of storage lowest sprouting (0.95%) and decay loss (2.33 %) were recorded in advance line-799 and found at par with advance line-827 in respect of sprouting, while advance lines-784, 793, 810, 823, 827, 830 and 865 regarding decay loss. Lowest PLW (14.94 %) and total loss (18.23 %) were recorded in advance line-799 and were at par with advance lines-784, 793, 827, 865 and 857 in respect of physiological loss of weight (Table 4).

Table 4: Storage performance of white onion advance lines after four months of storage at Nashik

Lines	Sprouting %		Decay Loss %		*PLW %		*Total Loss %	
L-562	5.69	(2.48)	10.18	(3.15)	32.76	(34.81)	48.63	(44.21)
L-784	7.09	(2.75)	4.70	(2.24)	18.30	(25.29)	30.09	(33.25)
L-793	3.36	(1.95)	5.24	(2.33)	18.62	(25.55)	27.23	(31.39)
L-799	0.95	(1.16)	2.33	(1.65)	14.94	(22.71)	18.23	(25.26)
L-810	4.89	(2.30)	5.04	(2.28)	25.78	(30.49)	35.71	(36.69)

L-823	3.74	(2.05)	5.03	(2.34)	26.50	(30.96)	35.27	(36.43)
L-827	2.18	(1.63)	4.25	(2.17)	21.54	(27.61)	27.97	(31.91)
L-830	4.15	(2.15)	4.44	(2.21)	25.04	(30.00)	33.63	(35.43)
L-832	8.98	(3.07)	6.27	(2.60)	25.31	(30.18)	40.55	(39.55)
L-836	11.53	(3.47)	12.52	(3.61)	29.44	(32.81)	53.49	(47.01)
L-842	5.57	(2.46)	9.00	(3.08)	31.07	(33.83)	45.64	(42.49)
L-865	6.21	(2.59)	4.71	(2.28)	20.25	(26.73)	31.17	(33.94)
L-869	10.63	(3.34)	12.36	(3.58)	48.21	(43.97)	71.20	(57.64)
L-874	6.77	(2.69)	5.08	(2.36)	38.52	(38.36)	50.37	(45.21)
L-885	3.81	(2.07)	5.37	(2.42)	22.50	(28.30)	31.68	(34.25)
L-886	4.68	(2.26)	8.59	(3.01)	49.44	(44.68)	62.71	(52.52)
L-857	4.24	(2.16)	7.48	(2.82)	15.25	(22.95)	26.97	(31.28)
Agrifound white (C)	11.39	(3.39)	16.97	(4.18)	28.64	(32.10)	57.00	(49.11)
CD at± 5%	**-**	**0.47**	**-**	**0.69**	**-**	**5.06**	**-**	**5.04**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after five months of storage at Nashik

After five months of storage lowest sprouting (1.84 %) and decay loss (3.91 %) were recorded in advance line-799 and found at par with advance line-827 in respect of sprouting and advance lines-784, 810, 827, 830, 832, 865, 874, 885 and 857 regarding decay loss. Lowest PLW (19.17 %) and total loss (29.69 %) were recorded in advance lines-865 and 799, respectively, and found at par with advance lines-784, 810, 827, 885 and 857 in respect of PLW and advance lines-827, 865 and 857 regarding the total loss. The highest bulb recovery (152.97 qt/ha) was recorded in advance line-827 (Table 5).

Table 5: Storage performance of white onion advance lines after five months of storage at Nashik

Lines	Sprouting %		Decay Loss %		*PLW %		*Total Loss %		Good bulb recovery (q/ha)
L-562	7.48	(2.81)	13.67	(3.70)	33.44	(35.25)	54.59	(47.64)	87.78
L-784	13.19	(3.70)	7.17	(2.76)	27.76	(31.79)	48.12	(43.92)	68.51
L-793	6.34	(2.61)	10.00	(3.14)	33.31	(35.25)	49.65	(44.80)	88.72
L-799	1.84	(1.53)	3.91	(2.01)	23.94	(29.28)	29.69	(33.01)	133.23
L-810	7.15	(2.76)	6.20	(2.55)	29.91	(33.12)	43.26	(41.12)	108.02
L-823	9.94	(3.23)	9.57	(3.17)	39.82	(39.12)	59.33	(50.38)	47.09
L-827	2.44	(1.71)	4.25	(2.17)	26.73	(31.03)	33.42	(35.28)	152.97
L-830	12.82	(3.64)	6.32	(2.59)	41.45	(40.06)	60.59	(51.18)	55.52
L-832	10.15	(3.25)	6.73	(2.51)	32.33	(33.93)	49.22	(44.52)	96.28
L-836	13.01	(3.67)	12.81	(3.52)	35.41	(36.40)	61.23	(51.51)	63.40
L-842	7.47	(2.82)	11.37	(3.39)	37.42	(37.71)	56.26	(48.64)	70.92
L-865	8.52	(3.00)	5.72	(2.45)	19.17	(25.96)	33.42	(35.31)	105.12
L-869	9.28	(3.13)	12.36	(3.58)	41.71	(40.20)	63.34	(52.81)	57.31
L-874	8.92	(3.06)	7.48	(2.79)	33.08	(35.11)	49.49	(44.71)	126.51
L-885	10.40	(3.28)	7.40	(2.80)	27.64	(31.71)	45.44	(42.38)	87.79
L-886	9.54	(3.15)	10.64	(3.32)	38.08	(38.08)	58.26	(49.76)	78.56
L-857	7.74	(2.81)	9.23	(3.06)	19.59	(25.63)	36.55	(37.00)	138.69
Agrifound white (C)	13.14	(3.60)	17.49	(4.23)	32.86	(34.88)	63.49	(52.96)	67.73
CD at± 5%	**-**	**0.65**	**-**	**1.06**	**-**	**7.30**	**-**	**7.05**	-

Note: Data in the parenthesis shows square root and *arcs in transformed values

Performance evaluation at Karnal

The data pertaining to Karnal has been presented in Table 6 to 10.

Storage performance of after one month of storage at Karnal

Results presented in Table 6 revealed that the highest gross yield (290.28 qt/ha) and marketable yield (258.82 qt/ha) were recorded in advance line-810 and 562, respectively, and found at par with advance line-562 in respect of gross yield. After one month of storage, nil sprouting was recorded in all advance lines. Lowest decay loss (1.11 %) was recorded in advance line-887 and it was at par with advance lines-562, 830, 865, 869, 874 and check variety Agrifound White. Lowest PLW (4.75 %) and total loss (5.98 %) were recorded in advance lines-827 and 830, respectively, and found at par with advance lines-562, 784, 810, 823, 830 and 887 in respect of PLW and advance lines-562, 784, 827, 865, 887 and check variety Agrifound White regarding total loss.

Table 6: Storage performance of white onion advance lines after one month of storage at Karnal

Lines	Gross Yield qt/ha	Marketable Yield qt/ha	Sprouting %		Decay Loss %		PLW %		Total Loss %	
L-562	287.43	258.82	0.00	(0.71)	2.96	(1.84)	5.49	(2.45)	8.45	(2.98)
L-784	258.11	214.11	0.00	(0.71)	3.84	(2.03)	5.55	(2.45)	9.39	(3.11)
L-793	262.22	207.78	0.00	(0.71)	5.36	(2.40)	6.75	(2.67)	12.11	(3.53)
L-810	290.28	216.02	0.00	(0.71)	7.04	(2.74)	5.73	(2.49)	12.77	(3.64)
L-823	252.33	119.56	0.00	(0.71)	6.18	(2.54)	5.38	(2.42)	11.56	(3.45)
L-827	258.43	192.69	0.00	(0.71)	3.76	(2.06)	4.75	(2.28)	8.51	(2.99)
L-830	261.48	217.09	0.00	(0.71)	1.18	(1.29)	4.80	(2.30)	5.98	(2.54)
L-832	227.17	168.46	0.00	(0.71)	3.87	(2.04)	6.50	(2.64)	10.37	(3.28)
L-836	239.50	190.59	0.00	(0.71)	4.99	(2.34)	7.15	(2.76)	12.13	(3.55)
L-865	237.87	194.63	0.00	(0.71)	2.92	(1.78)	5.56	(2.46)	8.48	(2.98)
L-869	261.48	191.67	0.00	(0.71)	3.38	(1.95)	5.69	(2.49)	9.07	(3.09)
L-874	214.33	176.30	0.00	(0.71)	3.28	(1.94)	6.43	(2.62)	9.71	(3.19)
L-885	224.07	196.11	0.00	(0.71)	6.03	(2.55)	7.79	(2.87)	13.81	(3.77)
L-887	235.30	205.00	0.00	(0.71)	1.11	(1.27)	5.84	(2.52)	6.96	(2.73)
Agrifound white (C)	215.31	176.42	0.00	(0.71)	1.67	(1.39)	6.60	(2.66)	8.27	(2.94)
CD at± 5%	**25.24**	**28.98**	**-**	**-**	**-**	**0.68**	**-**	**0.33**	**-**	**0.57**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after two months of storage at Karnal

After two months of storage decay loss and total loss exhibited non-significant differences. No sprouting was recorded in all the advance lines. Lowest PLW (12.27 %) was recorded in advance line-784 and it was found at par with all advance lines except advance lines-874, 885 and check variety Agrifound white (Table 7).

Table 7: Storage performance of white onion advance lines after two months of storage at Karnal

Lines	Sprouting %		Decay Loss %		PLW %		Total Loss %	
L-562	0.00	(0.71)	5.19	(2.34)	12.49	(3.60)	17.68	(24.79)
L-784	0.00	(0.71)	9.09	(3.09)	12.27	(3.57)	21.36	(27.52)
L-793	0.00	(0.71)	7.28	(2.75)	15.73	(4.02)	23.01	(28.56)
L-810	0.00	(0.71)	13.47	(3.73)	12.61	(3.61)	26.08	(30.66)
L-823	0.00	(0.71)	11.02	(3.24)	16.13	(4.05)	27.16	(31.05)
L-827	0.00	(0.71)	7.11	(2.71)	13.51	(3.73)	20.61	(26.83)
L-830	0.00	(0.71)	8.00	(2.91)	13.96	(3.80)	21.96	(27.94)
L-832	0.00	(0.71)	9.93	(3.19)	15.87	(4.04)	25.80	(30.41)
L-836	0.00	(0.71)	7.71	(2.82)	15.95	(4.05)	23.65	(28.99)
L-865	0.00	(0.71)	9.59	(3.12)	14.79	(3.90)	24.37	(29.50)
L-869	0.00	(0.71)	9.71	(3.19)	14.76	(3.90)	24.47	(29.60)
L-874	0.00	(0.71)	10.69	(3.32)	20.32	(4.54)	31.01	(33.72)
L-885	0.00	(0.71)	14.35	(3.84)	19.76	(4.49)	34.11	(35.69)
L-887	0.00	(0.71)	7.18	(2.77)	16.13	(4.07)	23.31	(28.84)
Agrifound white (C)	0.00	(0.71)	11.20	(3.37)	19.07	(4.41)	30.27	(33.26)
CD at± 5%	**-**	**-**	**-**	**NS**	**-**	**0.57**	**-**	**NS**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after three months of storage at Karnal

After three months of storage decay loss exhibited non-significant differences. Lowest sprouting (0.48 %) was recorded in advance line-562 and found at par with advance lines-810, 823, 827, 830, 836, 865 and 869. Lowest PLW (20.42 %) and total loss (31.27 %) were recorded in advance line-830 and found at par with advance lines-562, 784, 793, 810, 827, 832, 836, 865 and 869 in respect of PLW and advance line-562, 784, 793, 810, 823, 827, 832, 836, 865 and 869 regarding total loss (Table 8).

Table 8: Storage performance of white onion advance lines after three months of storage at Karnal

Lines	Sprouting %		Decay Loss %		PLW %		Total Loss %	
L-562	0.48	(0.99)	7.80	(2.87)	23.11	(28.70)	31.39	(34.05)
L-784	2.61	(1.75)	12.40	(3.58)	20.99	(27.24)	36.00	(36.85)
L-793	2.67	(1.77)	8.35	(2.93)	21.81	(27.81)	32.83	(34.90)
L-810	0.80	(1.10)	17.28	(4.21)	21.57	(27.64)	39.65	(39.01)
L-823	1.56	(1.36)	13.29	(3.59)	26.80	(31.12)	41.64	(40.10)
L-827	0.60	(1.02)	9.71	(3.17)	23.03	(28.64)	33.33	(35.19)
L-830	1.18	(1.29)	9.67	(3.18)	20.42	(26.87)	31.27	(33.99)
L-832	1.75	(1.48)	11.52	(3.43)	22.57	(28.31)	35.83	(36.69)
L-836	1.27	(1.33)	9.71	(3.16)	23.03	(28.67)	34.00	(35.63)
L-865	0.93	(1.19)	13.19	(3.66)	23.19	(28.75)	37.31	(37.60)
L-869	1.24	(1.31)	12.47	(3.60)	22.53	(28.29)	36.24	(36.98)
L-874	5.97	(2.54)	12.29	(3.55)	29.39	(32.79)	47.65	(43.65)
L-885	4.61	(2.24)	18.96	(4.41)	32.45	(34.72)	56.03	(48.47)
L-887	7.00	(2.74)	11.80	(3.50)	27.91	(31.87)	46.71	(43.11)
Agrifound white (C)	2.60	(1.75)	14.47	(3.82)	29.73	(32.96)	46.80	(43.14)
CD at± 5%	**-**	**0.43**	**-**	**NS**	**-**	**3.85**	**-**	**6.92**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after four months of storage at Karnal

After four months of storage lowest sprouting (1.04 %) and decay loss (9.60 %) were recorded in advance line-562 and 793, respectively, and found at par with advance lines-810, 823, 827, 830, 832, 836 and 865 in respect of sprouting and advance lines-562, 784, 823, 827, 830, 832, 836 and 869 regarding decay loss. Lowest PLW (26.19 %) and total loss (39.07 %) were recorded in advance line-793 and found at par with advance lines-562, 784, 810, 827, 830, 832 and 869 in respect of PLW and advance lines-562, 784, 823, 827, 830, 832, 836, 865 and 869 regarding total loss (Table 9).

Table 9: Storage performance of white onion advance lines after four months of storage at Karnal

Lines	Sprouting %		Decay Loss %		PLW %		Total Loss %	
L-562	1.04	(1.19)	10.12	(3.24)	31.29	(34.00)	42.45	(40.65)
L-784	3.73	(2.05)	13.84	(3.79)	28.48	(32.23)	46.05	(42.73)
L-793	3.28	(1.88)	9.60	(3.11)	26.19	(30.76)	39.07	(38.62)
L-810	2.08	(1.60)	19.44	(4.46)	28.75	(32.40)	50.27	(45.15)
L-823	1.56	(1.36)	13.96	(3.71)	32.62	(34.80)	48.13	(43.93)
L-827	1.16	(1.14)	11.79	(3.48)	29.05	(32.59)	42.00	(40.36)
L-830	2.20	(1.64)	11.02	(3.38)	27.22	(31.44)	40.44	(39.48)
L-832	2.32	(1.62)	14.25	(3.83)	31.10	(33.89)	47.67	(43.66)
L-836	2.87	(1.73)	12.11	(3.50)	31.93	(34.40)	46.91	(43.20)
L-865	1.71	(1.48)	15.85	(4.03)	32.44	(34.66)	50.00	(45.00)
L-869	3.70	(2.05)	14.38	(3.85)	30.17	(33.31)	48.24	(43.99)
L-874	10.35	(3.29)	16.21	(4.07)	36.19	(36.97)	62.75	(52.40)
L-885	9.23	(3.11)	23.84	(4.93)	38.72	(38.47)	71.79	(57.96)
L-887	9.76	(3.20)	18.18	(4.32)	37.80	(37.92)	65.73	(54.20)
Agrifound white (C)	3.40	(1.97)	18.27	(4.29)	38.00	(38.03)	59.67	(50.63)
CD at± 5%	**-**	**0.68**	**-**	**0.88**	**-**	**3.54**	**-**	**6.45**

Note: Data in the parenthesis shows square root and *arcs in transformed values

Storage performance of after five months of storage at Karnal

After five months of storage lowest sprouting (2.79 %) and decay loss (11.63 %) were recorded in advance line-827 and 793, respectively and found at par with advance line-562, 793, 810, 823, 830, 832 and 836 in respect of sprouting and advance lines-562, 784, 823, 827, 830, 832, 836, 869 and 887 regarding decay loss. Lowest PLW (32.24 %) and total loss (48.40 %) were recorded in advance line-793 and found at par with advance lines-784, 810, 827, 830, 832, 836 and 869 in respect of PLW and

advance lines-562, 784, 810, 827, 830, 832 and 836 regarding total loss (Table 10). However, good bulb recovery (107.21 qt/ha) were recorded in advance line-793. It is noted that comparatively lower losses than Madgum (1981), Saimbhi and Randhawa (1982), Singh *et al.* (2010), and Singh *et al.* (2011), they reported 50% storage loss due to physiological loss of weight. The major total loss occurred after four months of storage. The result aligns with Patil and Kale (1989).

Table 10: Storage performance of white onion advance lines after five months of storage at Karnal

Lines	Sproutin g %		Decay Loss %		PLW %		Total Loss %		Good bulb recovery (q/ha)
L-562	3.28	(1.94)	14.39	(3.85)	42.31	(40.57)	59.97	(50.76)	103.61
L-784	6.91	(2.72)	14.21	(3.83)	36.32	(37.05)	57.44	(49.29)	91.13
L-793	4.53	(2.18)	11.63	(3.42)	32.24	(34.59)	48.40	(44.07)	107.21
L-810	4.88	(2.26)	20.08	(4.53)	33.36	(35.25)	58.32	(49.84)	90.04
L-823	4.36	(2.20)	16.22	(4.00)	40.62	(39.58)	61.20	(51.62)	46.39
L-827	2.79	(1.70)	12.05	(3.52)	36.20	(36.98)	51.04	(45.61)	94.34
L-830	5.89	(2.50)	13.87	(3.76)	35.67	(36.67)	55.42	(48.12)	96.78
L-832	5.95	(2.48)	15.02	(3.93)	39.37	(38.86)	60.33	(50.97)	66.83
L-836	3.53	(1.85)	12.11	(3.50)	37.51	(37.76)	53.15	(46.82)	89.29
L-865	9.63	(3.10)	20.31	(4.55)	41.61	(40.14)	71.55	(57.90)	55.37
L-869	7.14	(2.74)	17.64	(4.25)	39.26	(38.80)	64.04	(53.19)	68.92
L-874	22.61	(4.80)	22.08	(4.73)	46.40	(42.93)	91.09	(72.65)	15.71
L-885	20.64	(4.60)	23.84	(4.93)	44.27	(41.71)	88.75	(70.54)	22.06
L-887	29.71	(5.50)	18.18	(4.32)	45.40	(42.36)	93.29	(75.37)	13.76
Agrifound white (C)	12.60	(3.61)	19.73	(4.48)	40.87	(39.61)	73.20	(59.07)	47.28
CD at± 5%	-	**0.88**	-	**0.90**	-	**4.67**	-	**7.35**	-

Note: Data in the parenthesis shows square root and *arcs in transformed values

REFERENCES

Gupta AJ, Mahajan V and Singh M. 2019. Evaluation of onion breeding lines for table purpose. ***Journal of AgriSearch*** **6** (3) 113-116.

Kurade AG and Mathias M. 1972. Plan for promotion of export of dehydrated onion from India. *Indian Food Packer* **26**(8):17.

Madgum SB. 1981. Genetic diversity in onion (*Allium cepa* L) germplasm with special reference to storage quality. M. Sc. Thesis, MPKV Rahuri.

Pandey UB. 1989. Onion (*Allium cepa* L.). *Indian Horticulture* **33-34**:58-62.

Patil RS and Kale PN. 1989. Screening of onion cultivars for storage quality. *Vegetable Science* **16** (1): 56-61.

Saimbhi MS and Randhawa KS. 1982. Losses in white onion varieties under ordinary storage conditions as influenced by bulb size. *Journal Research* **9** (3): 188-190.

Saimbhi MSS, Padda DH and Singh G. 1971. Evaluation of onion variety for dehydration traits. J. *Food Sci. and Technology* **8**(3):149-150.

Sethi V, Anand JC and Bhagchandani PM.1993. Quality screening of white onion cultivars for use in dehydration. *Indian Food Packer* **27** (5): 3-8.

Singh DK, Singh L and Pandey UB. 2004. Nutritional and medicinal values of onion and garlic. *NHRDF News Letter* XXIV (2): 4-10.

Singh HM and Singh Satyendra. 2019. Effect of different Spacing and Transplanting Dates on Growth and Yield of Onion (*Allium cepa*. L) var. Agrifound Light Red. ***Journal of AgriSearch*** **6**: (Special issue): 64-67.

Singh RK, Bhonde SR and Gupta RP. 2010. Studies on performance of onion (*Allium cepa* L.) hybrids for higher yield. Allium and Umbelliferae Improvement. *Newsletter* 20: 21-26.

Singh RK, Dubey BK, Singh SK and Bhonde SR. 2011. Selection of high yielding and good keeping quality variety in red onion. *Progressive Horticulture* **43** (2): 243-247.

Warade SD, Shinde SV and Gaikwad SK. 1998. Studies on periodical losses in onion. *Allium Improvement News Letter* **8** : 32-37.

Citation:
Singh R K, Singh S K and Tailor A K.2020. Performance studies on storage of white onion for good keeping quality onion varieties under ordinary condition. *Journal of AgriSearch* **7**(2): 86-92