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Influence of storage conditions on quality and shelf life of stored peas

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Abstract
An investigation entitled "Influence of Storage Conditions on Quality and Shelf Life of Stored Peas was carried out at Department of Post Harvest Technology, College of Horticulture, UAS, GKVK, Bengaluru during the year 2019-20 and 2020-21. The experimental material used and techniques adopted in the experimentation are Shrink wrap (Polyfilm) & Aluminium foil wrap with different varieties of Garden Peas. Variety generally ranked best in storage shelf life the order T_{10} (Arka Apoorva) > T_9 (Arka Karthik) while less consumer acceptability was found in T_{15} (Magadi Local).

Keywords: Peas, storage, relative humidity, temperature, quality, shelf life

Introduction
According to Pawar *et al.* (2017) [4], it is the second most significant legume crop worldwide. The dried, green foliage is fed to cattle, and the very nutritious green pods are chosen for cooking. For every 100 g of edible part, this legume has a high percentage of digestible protein (7.2 g), carbohydrates (15.8 g), Vitamin A (139 I.U.), vitamin C (9 mg), Magnesium (34 mg), and Phosphorus (139 mg).

An essential component of contemporary agricultural output is appropriate postharvest processing and handling. Harvesting, cleaning, grading, cooling, storing, packaging, transportation, and selling are all interconnected postharvest operations. The gap between the producer and the consumer, which is frequently caused by time and distance, is filled by postharvest handling technologies. In order to overcome issues, postharvest handling requires the practical application of engineering principles and an understanding of the physiology of fruits and vegetables (Fasana, 2006) [1].

Fresh fruit and vegetable postharvest losses are caused by a variety of circumstances. These include unfavorable postharvest sanitation, inadequate cooling and environmental control, mechanical damage sustained during harvesting and handling, and environmental factors like heat or drought. The incidence of disease is frequently greatly decreased by attempts to regulate these factors. For instance, since many disease-causing organisms (pathogens) must enter through wounds, minimizing mechanical damage during grading and packaging significantly reduces the incidence of postharvest disease (Fasana, 2006) [1].

How to preserve fresh vegetable products to feed a growing population is a problem for decision-makers in many countries. There have been numerous efforts in the past. Vegetable goods are challenging to preserve commercially due to transportation networks and high temperatures that encourage deterioration rather than storage. Therefore, the purpose of this study was to assess how traditional storage conditions affected the quality and shelf life of three cultivars of peas.

Materials and Methods
Plant material: Garden Pea pods were got from fields established specifically for the purpose of this experiment on the experimental grounds of the Department of Horticulture, UAS, GKVK, Bengaluru. Geographically, the place is located at 13^0 05" N latitude and 77^0 34" E longitude with an altitude of 924 meters above mean sea level. The land had been under tomato and pepper cultivation in the previous year. The area during cultivation had average of 21.3°C temperature and relative humidity of 85%.

Peas namely Green Pea (Pisum sativum), were used. NPK Farm Yard Manure: 10 t/ha, NPK: Nitrogen @ 25 kg/ha, Phosphorous @75 kg/ha, Potassium @ 50 kg/ha., all other agronomic practices for the growth of crop follows essentially that used Pre-planting soil analyses showed the soil to contain nitrogen 0.03%, Organic matter 0.03%, available P 0.24 g kg¹, potassium 0.14%, calcium 0.52%, pH of 6.4 to 6.8. and a sandy loam texture. Fresh Garden peas were harvested at right maturity stage. Harvesting was done early in the morning and transported to laboratory in poly bags for furthering the experimentation. Then, Garden peas were packed in different packaging treatments, each pack contained 200 g of garden peas. Packed Garden peas were then stored under normal room and refrigerated (7 °C) conditions. Each pack of Garden peas was kept undisturbed until the scheduled date of observation.

Storage treatment: Shrink wrap (Polyfilm) & Aluminium foil wrap obtained from local market of Bangalore were used for packaging the pods of Garden Pea Varieties. Storage conditions were utilized with 3 treatment conditions T_1: Control (No package + Room condition), T_2: (Aluminium foil wrap + Room condition), T_3: (Shrink wraps (Polyfilm) + Refrigerated condition) with 15 cultivars RH within the bag was maintained at >95%. Each group of bags was held separately in a commercially available 580×720×155 mm vented plastic container and the containers were stalked in the appropriate storage condition in the dark. No free water accumulated in the bags during storage.

Tender Peas, for each treatment stored under different packaging condition were observed for their storability. There were 9 packs, each containing 200 g of Garden peas for each treatment under different packaging treatment. All the Garden peas removed from each package on scheduled day of observation were used to record different observations. Thus, each pack in the storage condition, passed through the storage time undisturbed, until it was finally taken-out to observe for different parameters.

Samples from each treatment were examined at the end of every third day. This way, storage studies were conducted for 15 days. The following parameters were recorded when storage samples were opened.

Statistical analyses: This was done using the Factorial RCBD design with three replicates per treatment. There were combinations of storage conditions with 3 treatment conditions T_1: Control (No package + Room condition), T_2: (Aluminium foil wrap + Room condition), T_3: (Shrink wraps (Polyfilm) + Refrigerated condition) with 15 cultivars Randomized Complete Block Design (RCBD) was used to compare the means at 5% probability.

Observations were recorded for various Physical Parameters for Colour, Estimation of T.S.S and Biochemical parameters and Sensory evaluation (5-point hedonic scale).

Appearance of wrinkles (recorded based on score card)

Sensory scores of appearances of wrinkles of garden pea were carried out by a semi-trained panel consisting of students of Department of Horticulture, UAS, Bengaluru, with the help of five-point hedonic rating scale (1 = Like Extremely; 2= Like Very Much; 3= Like Moderately; 4=Like Slightly; 5 =Neither Like nor Dislike).

Results and Discussion

Total Soluble Solids (ºBrix) in Unpacked Storage Under Room condition

Significant differences were observed for TSS **(**ºBrix**)** in unpacked storage under room condition (Table 1). From the two seasons pooled mean, higher T.S.S content was recorded in T_9 (Arka Karthik) during 3rd, 6th, 9th day of storage (20.39, 21.83, 23.40 ºBrix) followed by T_{10} (Arka Apoorva) (19.38, 20.95, 22.81ºBrix) and T_4 (Kashi Uday)(18.41, 20.12, 22.15ºBrix) however, lower moisture content was recorded in T_{15} (Magadi Local) (13.40, 14.82, 17.12ºBrix). Interaction between the treatments and the seasons did not show any significant effect on T.S.S content. Higher T.S.S (23.69 ºBrix) was observed 9th day of storage in S_1T_9 followed by S_2T_9 (23.11ºBrix), S_1T_{10} (22.78ºBrix) and S_2T_{15} (16.26ºBrix) while the lowest T.S.S content was recorded in S_2T_{15} (16.26ºBrix).

Table 1: T.S.S (° Brix) of Garden Peas recorded under field condition at different days of storage (Without packing Under Room condition)

Without packing + Room condition									
	3rd Day of storage			6th Day of storage			9th Day of storage		
Treatments	S1 (2019-20)	S2 (2020-21)	Pooled Mean	S1 (2019-20)	S2 (2020-21)	Pooled Mean	S1 (2019-20)	S2 (2020-21)	Pooled Mean
T1 (Kashi Mukthi)	17.39	17.11	17.25	19.26	18.82	19.04	21.16	21.14	21.15
T2 (Kashi Ageti)	16.67	16.59	16.63	18.41	18.40	18.41	20.60	20.43	20.52
T3 (Kashi Nandini)	18.02	17.80	17.91	19.41	19.36	19.39	21.46	21.46	21.46
T4 (Kashi Uday)	18.48	18.33	18.41	20.17	20.07	20.12	22.39	21.91	22.15
T5 (PSM-2)	16.44	16.31	16.38	18.38	18.26	18.32	20.38	20.19	20.29
T6 (PSM-3)	16.24	16.20	16.22	18.25	18.14	18.20	20.10	19.76	19.93
T7 (PSM-4)	14.96	14.07	14.52	16.71	15.97	16.34	18.68	18.03	18.36
T8 (PSM-6)	18.32	18.31	18.32	19.93	19.73	19.83	21.87	21.76	21.82
T9 (Arka Karthik)	20.44	20.33	20.39	21.84	21.82	21.83	23.69	23.11	23.40
T10(Arka Apoorva)	19.79	18.97	19.38	21.01	20.89	20.95	22.84	22.78	22.81
T11 (ArkaUttam)	17.67	17.55	17.61	19.31	19.30	19.31	21.38	21.19	21.29
T12(Kashi Samriddhi)	15.92	15.09	15.51	17.55	16.72	17.14	19.70	19.16	19.43
T13(Kashi Shakti)	18.22	18.15	18.19	19.51	19.46	19.49	21.49	21.47	21.48
T14 (Pant Uphar)	16.82	16.73	16.78	18.77	18.63	18.70	20.76	20.69	20.73
T15(Magadi Local)	13.59	13.20	13.40	15.25	14.39	14.82	17.97	16.26	17.12
Mean	17.26	16.98	GM = 17.13	18.92	18.66	GM = 18.8	20.96	20.62	GM = 20.8
SV		Sem+	CD @ 5%	SV	Sem+	CD @ 5%	SV	Sem+	CD @ 5%
Season		0.09	0.27	Season	0.08	0.23	Season	0.09	0.27
Treatment		0.26	0.73	Treatment	0.22	0.62	Treatment	0.26	0.73
SxT		0.36	NS	SxT	0.31	NS	SxT	0.37	NS

From the two seasons pooled mean, it was observed that higher T.S.S content (^{0}Brix) on 3rd, 6th, 9th day of storage was recorded in Arka Karthik. It was noticed that under unpacked storage under room condition, there was gradual increase in T.S.S content with increase in the period of storage. The T.S.S content (ºBrix) increased from 13.20 ºBrix to 23.40ºBrix. Significant differences in T.S.S content under room condition could be due to temperatures that might have prevailed during storage. It was noticed that T.S.S content increased rapidly at room temperature. Increase in TSS levels during storage period could be due to the ripening process. These findings take supported from the research results of by Malik, and Jitender, (2009) [2], in Peas.

Total soluble Solid (ºBrix) in packed (Shrink wrapping) storage under refrigerated condition

Significant differences between the treatments T.S.S (^{0}Brix) were obtained for packed (shrink wrapping) storage under refrigerated condition. The data are presented in Table 2.

From the two seasons pooled mean, it was observed that higher T.S.S was recorded in T_9 (Arka Karthik) on 3rd, 6th and 9th and 12th and 15th day of storage (21.00, 21.79, 22.69, 23.77, 24.45 ^{0}Brix), T_{10} (Arka Apoorva) (20.28, 21.32, 21.86, 22.89, 23.72 ^{0}Brix) and T_8 (PSM-6) (18.95, 19.92, 20.77, 21.74, 22.73 ^{0} Brix). However, lower T.S.S was recorded in T_{15} (Magadi Local) (12.39, 15.79, 16.85, 17.26, 18.03 ^{0}Brix). However, among the interaction between the treatments, higher T.S.S (21.77 ^{0}Brix) was observed in S_1T_{10}, S_2T_{10} (20.85), S_1T_9 (20.12) and S_2T_9 (20.85) which were on par with each other while the lowest T.S.S (^{0}Brix) was noticed in (12.07) in S_2T_{15} at 3rd day of storage and there was gradual increase in T.S.S (^{0}Brix) until the end of the storage period.

Table 2: T.S.S (°Brix) of Garden Peas recorded under open field condition at different days of storage (Shrink wrapping under Refrigerated condition)

Shrink wrapping + Refrigerated condition									
	3rd Day of storage			6th Day of storage			9th Day of storage		
Treatments	S1 (2019-20)	S2 (2020-21)	Pooled Mean	S1 (2019-20)	S2 (2020-21)	Pooled Mean	S1 (2019-20)	S2 (2020-21)	Pooled Mean
T1 (Kashi Mukthi)	17.97	17.96	17.97	19.02	18.97	19.00	19.89	19.85	19.87
T2 (Kashi Ageti)	17.69	17.33	17.51	18.19	17.79	17.99	18.98	18.78	18.88
T3 (Kashi Nandini)	18.64	18.62	18.63	19.56	19.54	19.55	20.47	20.34	20.41
T4 (Kashi Uday)	19.64	19.37	19.51	20.71	20.32	20.52	21.57	21.30	21.44
T5 (PSM-2)	16.76	16.74	16.75	17.67	17.59	17.63	18.76	18.59	18.68
T6 (PSM-3)	16.66	16.27	16.47	17.39	17.16	17.28	18.55	18.22	18.39
T7 (PSM-4)	15.59	15.02	15.31	16.40	16.23	16.32	17.31	17.00	17.16
T8 (PSM-6)	19.00	18.89	18.95	19.93	19.90	19.92	20.79	20.75	20.77
T9 (Arka Karthik)	21.51	20.48	21.00	21.97	21.50	21.74	23.10	22.27	22.69
T10(Arka Apoorva)	20.34	20.22	20.28	21.44	21.19	21.32	22.11	21.60	21.86
T11 (ArkaUttam)	18.59	18.05	18.32	19.14	19.07	19.10	20.15	19.93	20.04
T12(Kashi Samriddhi)	15.87	15.63	15.75	16.68	16.59	16.64	17.64	17.52	17.58
T13(Kashi Shakti)	18.86	18.71	18.79	19.81	19.60	19.71	20.66	20.51	20.59
T14 (Pant Uphar)	17.83	17.74	17.79	18.95	18.78	18.87	19.80	19.29	19.55
T15(Magadi Local)	14.87	9.91	12.39	15.96	15.61	15.79	16.96	16.74	16.85
Mean	17.99	17.40	GM = 17.7	18.85	18.66	GM = 18.76	19.78	19.51	GM =19.65
SV		Sem+	CD @ 5%	SV	Sem+	CD @ 5%	SV	Sem+	CD @ 5%
Season		0.19	0.53	Season	0.06	0.17	Season	0.06	0.18
Treatment		0.52	1.46	Treatment	0.17	0.48	Treatment	0.17	0.50
SxT		0.73	NS	SxT	0.24	NS	SxT	0.25	NS

Shrink wrapping + Refrigerated condition						
Treatments	12th Day of storage			15th Day of storage		
	S1 (2019-20)	S2 (2020-21)	Pooled Mean	S1 (2019-20)	S2 (2020-21)	Pooled Mean
T1 (Kashi Mukthi)	20.78	20.66	20.72	21.69	21.59	21.64
T2 (Kashi Ageti)	20.36	20.21	20.29	21.13	21.10	21.12
T3 (Kashi Nandini)	21.37	21.36	21.37	22.39	22.06	22.23
T4 (Kashi Uday)	22.34	22.22	22.28	23.41	23.01	23.21
T5 (PSM-2)	19.89	19.80	19.85	20.86	20.75	20.81
T6 (PSM-3)	19.76	19.27	19.52	20.62	20.34	20.48
T7 (PSM-4)	18.18	17.81	18.00	19.67	19.11	19.39
T8 (PSM-6)	21.79	21.69	21.74	22.75	22.71	22.73
T9 (Arka Karthik)	24.03	23.50	23.77	25.11	23.79	24.45
T10(Arka Apoorva)	23.10	22.67	22.89	23.73	23.70	23.72
T11 (ArkaUttam)	20.97	20.88	20.93	22.05	21.89	21.97
T12(Kashi Samriddhi)	18.50	18.21	18.36	19.88	19.88	19.88
T13(Kashi Shakti)	21.42	21.41	21.42	22.68	22.66	22.67
T14 (Pant Uphar)	20.53	20.37	20.45	21.45	21.24	21.35
T15(Magadi Local)	17.29	17.22	17.26	18.16	17.90	18.03
Mean	20.69	20.49	GM = 20.59	21.71	21.45	GM = 21.58
SV		Sem+	CD @ 5%	SV	Sem+	CD @ 5%
Season		0.06	0.17	Season	0.07	0.20
Treatment		0.16	0.46	Treatment	0.19	0.54
SxT		0.23	NS	SxT	0.27	NS

From the two seasons pooled mean, it was observed that higher T.S.S was recorded in T_9 (Arka Karthik) on 3rd, 6th and 9th, 12th and 15th days of storage. Total soluble solids ranged from 13.32 per cent to 21.31 per cent. However, interactions between the treatments and the seasons did not show any significant effect on T.S.S and there observed gradual increase in T.S.S when Garden Pea Seeds were packed with Shrink Wrapping and stored under refrigerated condition in comparision to normal room condition and Aluminium foil packaging. The probable reason for the reduction in T.S.S content with Shrink Wrapping Stored under Refrigerated Condition was observed as shrink-wrapping acts as a complete barrier to light and oxygen and reduces moisture due to its semi permiability which enables storage without refrigeration. The results obtained by Sharma *et al.,* (2018) [6], in Bell pepper.

Total soluble Solid (ºBrix) under packed (Aluminium foil) storage under Room condition

The significant differences for T.S.S content **(º**Brix**)** were recorded in packed **(**Aluminum Foil) storage under room condition. The data are presented in Table 3. From the two seasons pooled mean, it was observed that higher T.S.S (ºBrix) content at 3rd, 6th,9th,12th day of storage (23.06, 23.88, 24.82, 25.54 ºBrix) was recorded in T_9 (Arka Karthik) followed by T_{10} (Arka Apoorva) (21.57, 23.10, 24.12, 24.86 (ºBrix) and T_4 (Kashi Uday) (21.18, 22.37, 23.41, 24.37ºBrix). However lower T.S.S was recorded in T_{15} (Magadi Local) (16.36, 17.10, 18.16, 19.20ºBrix). Any way the interaction between the treatments and the seasons did not show any significant effect on T.S.S **(º**Brix). Higher T.S.S content (25.37ºBrix) was observed in S_1T_9 followed by S_2T_9 (25.37ºBrix), $S1T_9$ (25.17 ºBrix), and S_2T_{10} (24.57ºBrix), while the lowest T.S.S was recorded in Magadi Local (19.20º Brix) at the end of storage period.

From the two seasons pooled mean, it was observed that higher T.S.S (ºBrix) content on 3rd, 6th,9th, and 12th day of storage was recorded in Arka Karthik in packaged storage (Aluminium foil) under room conditions. It was observed that there was gradual increase in T.S.S with increase in the period of storage. Total soluble solids content ranged from 12.87 per cent to 23.33 per cent under unpacked storage under Aluminium foil+ Room condition. Gradual increase in T.S.S content was less in Aluminium foil packing compared to room condition Garden pea seeds stored in aluminum foil packaging showed high succinate dehydrogenase and cytochrome oxidase specific activities and delays seed deterioration The results take support from the findings of Ozukum *et al.* (2021) [3], in Naga King Chilli.

Table 3: T.S.S (° Brix) of Garden Peas recorded under Open field condition at different days of storage (Aluminum foil under Room condition)

(Aluminium foil + Room condition)									
	3rd Day of storage			6th Day of storage			9th Day of storage		
Treatments	**S_1 (2019-20)**	**S_2 (2020-21)**	**Pooled Mean**	**S_1 (2019-20)**	**S_2 (2020-21)**	**Pooled Mean**	**S_1 (2019-20)**	**S_2 (2020-21)**	**Pooled Mean**
T_1 (Kashi Mukthi)	19.14	18.71	18.93	20.35	20.32	20.34	21.55	21.52	21.54
T_2 (Kashi Ageti)	18.47	18.42	18.45	19.61	19.33	19.47	21.19	21.16	21.18
T_3 (Kashi Nandini)	20.13	19.97	20.05	21.22	21.13	21.18	22.11	22.11	22.11
T_4 (Kashi Uday)	21.18	21.17	21.18	22.43	22.31	22.37	23.58	23.24	23.41
T_5 (PSM-2)	18.41	18.25	18.33	19.32	19.30	19.31	21.12	20.72	20.92
T_6 (PSM-3)	18.16	18.13	18.15	19.29	19.28	19.29	20.25	20.25	20.25
T_7 (PSM-4)	17.67	17.55	17.61	19.19	18.67	18.93	19.99	19.52	19.76
T_8 (PSM-6)	20.92	20.41	20.67	22.26	21.45	21.86	23.09	22.18	22.64
T_9 (Arka Karthik)	23.13	22.99	23.06	23.90	23.86	23.88	24.92	24.71	24.82
T_{10}(Arka Apoorva)	21.68	21.45	21.57	23.63	22.56	23.10	24.43	23.80	24.12
T_{11} (Arka Uttam)	19.29	19.20	19.25	20.99	20.37	20.68	22.09	21.57	21.83
T_{12}(KashiSamriddhi)	17.75	17.70	17.73	19.27	19.23	19.25	20.22	20.19	20.21
T_{13}(Kashi Shakti)	20.33	20.29	20.31	21.37	21.34	21.36	22.17	22.15	22.16
T_{14} (Pant Uphar)	18.61	18.52	18.57	20.08	19.90	19.99	21.26	21.20	21.23
T_{15}(Magadi Local)	17.31	15.41	16.36	18.16	16.03	17.10	19.14	17.17	18.16
Mean	Mean	19.21	GM = 19.35	20.74	20.34	GM = 20.54	21.81	21.43	GM = 21.62
SV		Sem+	CD @ 5%	SV	Sem+	CD @ 5%	SV	Sem+	CD @ 5%
Season		0.09	0.27	Season	0.08	0.23	Season	0.09	0.27
Treatment		0.26	0.73	Treatment	0.22	0.62	Treatment	0.26	0.73
SxT		0.36	NS	SxT	0.31	NS	SxT	0.37	NS

Aluminium foil +Room condition			
12thDay of storage			
Treatments	S_1(2019-20)	S_2(2020-21)	Pooled Mean
T_1 (Kashi Mukthi)	22.52	22.50	22.51
T_2 (Kashi Ageti)	22.32	22.22	22.27
T_3 (Kashi Nandini)	23.16	23.09	23.13
T_4 (Kashi Uday)	24.55	24.18	24.37
T_5(PSM-2)	22.15	22.09	22.12
T_6(PSM-3)	21.47	21.36	21.42
T_7(PSM-4)	21.14	21.09	21.12
T_8(PSM-6)	24.09	23.99	24.04
T_9 (Arka Karthik)	25.71	25.37	25.54
T_{10}(Arka Apoorva)	25.14	24.57	24.86
T_{11}(ArkaUttam)	23.08	22.81	22.95
T_{12}(Kashi Samriddhi)	21.22	21.21	21.22
T_{13}(Kashi Shakti)	23.50	23.22	23.36
T_{14} (Pant Uphar)	22.50	22.47	22.49

T_{15}(Magadi Local)	20.18	18.22	19.20
Mean	22.85	22.56	GM = 22.71
SV		Sem+	CD @ 5%
Season		0.09	0.24
Treatment		0.24	0.67
SxT		0.33	NS

Sensory score card for Garden Pea Varieties (Appearance of wrinkles Under field condition)

The statistical analysis showed significant difference in the mean values of appearance of wrinkles under open field condition. The sensory scores rated regarding to the appearance of shelled garden pea are presented in Table 4. It indicated that appearance of garden pea varieties varies from Like Extremely (5.00) to Neither like or Dislike (1.00) as given in table on 5-point hedonic scale method.

Garden Pea variety Arka Karthik at 3rd, (5.00), 6th (5.00), 9th (5.00), 12th (5.00) and 15th (5.00) day of storage under shrink wrapping with refrigerated condition. In T_{10} (Arka Apoorva) which was on par withT_9 (Arka Karthik) [(5.00), (5.00), (5.00), (5.00), and (5.00)], while less consumer acceptability was found in T_{15} (Magadi Local).

Change in appearance of seed from smooth to wrinkles may be due high sugar content in the wrinkled seeds which draw large amount of water by osmosis, causing the seed to swell, as the seeds dry out and lose volume and develop wrinkled appearance**.** These findings are similar to those obtained by Rani *et. al.* (2019) [5], in tomato, and Sharma *et. al.* (2018) [6], in bell pepper.

Table 4: Sensory Score card for Garden Pea varieties (Appearance of wrinkles) under Open Field condition

	3rd Day				6th Day				9th Day			
Treatments	**T_1**	**T_2**	**T_3**	**Mean**	**T_1**	**T_2**	**T_3**	**Mean**	**T_1**	**T_2**	**T_3**	**Mean**
V1	3	3	3	3.00	4	4	3	3.67	3	3	3	3.00
V2	2	2	2	2.00	3	3	3	3.00	2	2	2	2.00
V3	4	4	3	3.67	4	4	4	4.00	4	4	4	4.00
V4	5	4	4	4.33	5	5	5	5.00	5	5	5	5.00
V5	2	2	2	2.00	3	3	2	2.67	2	2	2	2.00
V6	2	2	1	1.67	2	2	2	2.00	2	1	1	1.33
V7	1	1	1	1.00	2	1	1	1.33	1	1	1	1.00
V8	4	4	4	4.00	5	5	5	5.00	4	4	4	4.00
V9	5	5	5	5.00	5	5	5	5.00	5	5	5	5.00
V10	5	5	5	5.00	5	5	5	5.00	5	5	5	5.00
V11	3	3	3	3.00	4	4	4	4.00	4	4	3	3.67
V12	1	1	1	1.00	2	2	2	2.00	1	1	1	1.00
V13	4	4	4	4.00	5	4	4	4.33	4	4	4	4.00
V14	3	2	2	2.33	3	3	3	3.00	3	3	2	2.67
V15	1	1	1	1.00	1	1	1	1.00	1	1	1	1.00
Mean	3.00	2.87	2.73	GM = 2.87	3.53	3.40	3.27	GM = 3.4	3.07	3.00	2.87	GM = 2.98
SV	Sem±		CD @ 5%		Sem±		CD @ 5%		Sem±		CD @ 5%	
Treatment	0.03		0.09		0.04		0.11		0.03		0.08	
Variety	0.07		0.20		0.09		0.26		0.06		0.18	
SxT	0.12		0.35		0.16		0.44		0.11		0.32	

Sensory scores of appearance of wrinkles of garden pea was carried out by a semi-trained panel consisting of students of Horticulture department, UAS, Bangalore with the help of five point hedonic rating scale (1 = Like Extremely; 2= Like Very Much; 3= Like Moderately; 4=Like Slightly; 5 =Neither Like Nor Dislike)

Conclusion

In summary Under storage conditions significantly influence post-harvest quality and shelf life of peas. Quality of peas could best be preserved by the Shrink wrapping under Refrigerated condition), followed by (Aluminum foil under Room condition) refrigeration, then in ambient storage environment. Variety generally ranked best in storage shelf life the order > T_{10} (Arka Apoorva) > T_9 (Arka Karthik) while less consumer acceptability was found in T_{15} (Magadi Local).

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