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Influence of Different Packaging Materials and Storage Conditions on the Seed Quality Parameters of Groundnut *(Arachis hypogaea* L.)

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ABSTRACT

Studies were carried out to find out the Influence of different packaging materials and storage conditions on the seed quality parameters of groundnut. Groundnut seeds were stored in different packaging materials viz., gunny bags, high density polythene bags and vacuum packed bags and stored at room temperature (25 ± 2º C) and cold storage (4 ± 1º C) for a period of 18 months. The treatments having six combinations and consisting of different containers viz., gunny bags, high density polythene bags and vacuum packed bags were replicated four times in both cold and ambient storage conditions in completely randomised block design. The results of the study revealed that the seed quality parameters viz., germination per cent, root length, shoot length, seedling vigour index and seedling dry weight decreased with an advancement of storage period but the electrical conductivity values were increased with advancement in storage period. While the more fluctuation was seen in moisture content values throughout storage period but it was constant for vacuum packaging. Among the containers, the seeds stored in vacuum packed bags maintained the quality with least deterioration compared to seeds stored in gunny bags and high density polythene bags. It was also observed that the seeds stored in vacuum packed bags maintained the seed quality with least deterioration with respect to all the seed quality parameters compared to seeds stored in gunny bags and high density polythene bags.

Key words: *Germination, Root and Shoot length, Seedling Vigour Index, Electrical conductivity, seedling dry weight, Vacuum packaging and Storage.*

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is another important oilseed crop of tropical and subtropical regions of the world. It is a primary source of edible oil and has a high oil content (44-50 %) and protein content (25 %) and is also a valuable source of vitamins E, K and B. It is the richest plant source of thiamine and is also rich in niacin, which is low in cereals. It occupies an area of 25.20 m ha with a production of 35.90 m tons and a productivity of 1420 kg per ha in the world.

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India is the largest groundnut growing country accounting 31.70 per cent of world area (8.00 m ha) and 37.50 per cent of production (7.30 m tons) with a productivity of 1298 kg per ha. In Karnataka, it is being cultivated over an area of 0.82 m ha with a production of 4.0 lakh tons and a productivity of 791 kg per ha[6].

Groundnut seed is a poor storer. Storing seeds after harvest till the next cropping season without impairing the quality is of prime importance for successful seed production. The problem of loss of seed viability is more severe in groundnut harvested in the summer season and about 50 per cent viability could be lost within 4-5 months of storage. Seed storage in groundnut is an imperative and inescapable for sensitivity of seed to environment, seasonal demand, dormancy, specificity of planting time, necessity of carry over and need of buffer seed stock. Seeds with high oil content appear to lose their germination and vigour in a short time despite the precaution taken during harvesting and drying. High temperature and high relative humidity cause rapid deterioration of viability and vigour of groundnut seeds. The environmental conditions that exist during the growth and harvest affect the seed quality and storability. Thus, the provenance plays a vital role in determining the seed storability.

Research on storability of seeds in India is of recent origin with the development of organized seed production and marketing. It is stipulated that 80 per cent of certified seeds produced in India require storage for one planting season and 20 per cent of seeds is carried over for subsequent sowing[9]. However, when the awareness and infrastructure is developed, substantial quantity of seeds can be stored for few planting seasons as a safeguard against monsoon failure and as a precaution against production of poor quality seeds. Seed viability is a major factor in crop establishment and subsequent productivity in many parts of the world. Losses in seed quality occur during field weathering, harvesting and storage. Seeds get damaged if they are exposed to high temperature and high humidity. The incidence of mycoflora is mainly responsible for the degradation of carbohydrates, lipids, protein and other food reserves resulting in reduction of seed vigour and germination.Seed deterioration has been ascribed to physical, physiological, bio-chemical and pathological detrimental changes occurring in seeds leading to death and has been characterized as inexorable, irreversible, inevitable, and minimal at the time of physiological maturity and variable among kinds of seeds, varieties and seed lots[15].

The farmer's practice of storing crop seeds in gunny bags as well as in cloth bags hastens up the seed quality deterioration process, thus resulting in poor seed quality. The use of high density polyethylene (HDPE) and metallised polyester polyethylene (MPP) packaging materials in seed storage were found to retain the quality, but for a limited period. Oxidation of seed food reserves ingredients such as carbohydrates, protein, lipids, vitamins, pigments and aroma compounds is one of the most important causes of quality loss during processing and storage[3]. A better solution therefore could be the use of low oxygen atmosphere packing system. Vacuum packaging is a technology that is being widely used in the meat industry, wherein the product is placed in a pack of low oxygen permeability, air is evacuated and the package sealed. The relative high cost of crop seeds and the overwhelming importance of retaining their seed quality for next season justify the selection of proper packaging strategy. Keeping all above these aspects in the view and considering their importance in maintaining viability for longer period the present investigation was carried out.

MATERIALS AND METHODS

A storage experiment was carried out for a period of 18 months i.e. from October-2010 to June-2012 at Department of Crop Physiology, University of Agricultural Sciences, Dharwad. Freshly harvested groundnut seeds (TMV-2) were dried under sun and stored under different storage conditions and containers. The temperature maintained in the cold storage

was around (4 °C ± 1°C) and relative humidity was 85 to 90 per cent throughout the storage period while, for ambient storage, bags were stored in the laboratory at room temperature (25 ± 2 groundnut seeds were packed in 500 g vacuum packed bags (The machine used for vacuum packaging of different seeds was OLPACK 501/V manufactured by INTERPRISE–BRUSSELS S.A., BRUXTAINER DIVISION, Belgium) and 15 kg to gunny and high density polythene bags. After packaging of all the seeds in different containers, 50 % bags were stored properly in the iron racks without stacking so that all the bags were uniformly exposed to the particular treatment condition; while 50 % bags were stored under cold storage. The treatments having six combinations and consisting of different containers viz., gunny bags, high density polythene bags and vacuum packed bags were replicated four times in both cold and ambient storage conditions in completely randomised design. The observations on various seed quality viz., germination test was conducted as per the ISTA procedure[5] using between paper method, vigour index values were computed using the formula of following and the mean values were expressed in whole number[1,3], electrical conductivity[26], and The per cent moisture, per cent solids and per cent were obtained by using MB 45 Halogen Moisture Analyzer from Ohaus, USA, respectively at bimonthly interval upto18 months. The analysis and interpretation of the experimental data was done as suggested by Panse and Sukhatme[25] with level of significance used as P = 0.01.

RESULTS AND DISCUSSION

Germination per cent (%)

Treatments differed significantly in the germination per cent due to storage period as well as storage conditions (Table 1). It was also observed that vacuum packed seeds maintained high seed germination per cent, irrespective of cold storage or room temperature at all the stages of storage even upto 18 months. While, seeds packed in gunny bags and high density polythene bags stored under room temperature maintained minimum seed certification standards upto 8 and 10 months and the germination per cent was reduced after 12 months onwards and until upto 18 months at room temperature. By the end of storage period, the maximum significant values of germination per cent (89.2 and 88.8 %) were recorded in vacuum packed seeds kept under cold storage and room temperature, while the minimum values of germination (56.7 and 51.0 %) was found in high density polythene bags followed by gunny bags (52.8 and 49.3 %), respectively. It is clear from the results that the storability of groundnut seeds is better under cold storage in all the packaging material followed by room temperature throughout the storage period. Similar results are also noticed by previous researchers as Ankaiah *et al*[4]., Balamurugan *et al*[8]., and Nataraj *et al*[24]., in sunflower, Tammanagouda *et al*[37]., Monira *et al*[22]., Baskin *et al*[11]., Sharma *et al*[36]., and Radhakrishna[27] in soybean seeds, Rao *et al*[30]., in bajara , Krishnappa *et al*[21]., and Narayanaswamy *et al*[23]., in groundnut.

Root and shoot length (cm)

The data pertaining to root length and shoot length (cm) of groundnut seeds as influenced by different packaging and storage conditions differed significantly between the treatments due to the storage period (Table 2 & 3). The root length and shoot length of vacuum packed seeds were almost steady and a slow but sure decline was seen with an advancement in storage period, while, the root length and shoot length of gunny bags as well as high density polythene packed seeds was found to reduce greatly from the initial stage to upto 18 months of storage under room temperature. During the end of storage, the vacuum packed seeds recorded significantly higher values of root length and shoot length (12.57 and 8.70 cm cm) under cold storage, which was superior over all other treatments and lower value of root length and shoot length (9.10 cm and 6.37 cm) was recorded in gunny bags kept under room temperature, which was also onpar with high density polythene bags at room temperature (9.23 cm and 6.63cm). From the

above results, it is clear that the vacuum packed seeds could be maintained the higher root length over high density polythene bags followed by cloth bags at all the stages of storage. These findings are in agreement with studies of Tammanagouda *et al*[37]. (2002) in green gram, Ravi Hunje *et al*[31]., and Barua *et al*[10]., in chilli, Narayanaswamy *et al*[23]., in groundnut, Alsadon *et al*[2]., in tomato and cucumber, Biradarpatil *et al*[13]., in rice, Saxena *et al*[34]., in onion, Khalequzzaman *et al*[20]., in frenchbean, Balamurugan *et al*[8]., in sunflower.

Seedling vigor index

Seedling vigour index of groundnut seeds differed significantly between treatments during storage period as depicted in (Table 4). The decline in seedling vigour index of vacuum packed seeds was marginal with advancement in storage period. While, seedling vigour index of gunny bags as well as high density polythene packed seeds was found to reduce greatly from the initial stage to 18 months of storage under room temperature. At the end of storage, vacuum packed seeds recorded significantly higher seedling vigour index (1896) over all other treatments, followed by vacuum packed bags under room temperature (1882). The lower seedling vigour index (763) was recorded in gunny bags followed by high density polythene bags (809) at room temperature. It is clear from the results that the vacuum packed seeds could maintain higher seedling vigour index while gunny bags and the high density polythene bags recorded onpar values of seedling vgour index at cold storage throughout the storage period. These results are in agreement with the study of several other research workers Doijode[16] and Ravi Hunje *et al*[31]., in chilli, Jayaraj *et al*[19]., in tomato and brinjal, Selvaraj[35] in delinted cotton seeds (cv. MCU-7), Bhattacharya and Raha[12] in maize. The decrease in seed germination with increasing length of storage period has been reported by many other workers[17,28].

Seedling dry weight (mg)

The influence of different packing and storage condition on seedling dry weight (mg) indicated significant differences between treatments during storage period (Table 5). The value of seedling dry weight in vacuum packed seeds was reduced marginally with progress in storage period. At 18 months of storage, the vacuum packed seeds recorded significantly higher seedling dry weight (291.0 mg) at cold storage, as compared to other treatments. Lower seedling dry weight (147.7 mg) was recorded in gunny bags at room temperature, and it was on par with high density polythene bags at room temperature (152.3 mg). It is clear from the results that the vacuum packed seeds could maintain the higher seedling dry weight over high density polythene bags followed by cloth bags at all the stages of storage. These findings are in agreement with studies of and Tammanagouda *et al*[37]., in green gram, Ravi Hunje *et al*[31]., and Barua *et al*[10]., in chilli, Narayanaswamy *et al*[23]., in groundnut, Alsadon *et al*[2]., in tomato and cucumber, Biradarpatil *et al*[13]., in rice, Saxena *et al*[34]., in onion, Khalequzzaman *et al*[20]., in French bean, Balamurugan *et al*[8]., in sunflower.

Moisture content (%)

The observations on moisture content of groundnut seeds (Table 6) differed significantly between the treatment upto 18 months of storage except at initial stage. At 2 months of storage, seeds stored in gunny bags at cold storage recorded maximum moisture content (14.03 %) followed by high density polythene bags (12.37 %), but these differed significantly with those stored at room temperature (12.77 and 10.30 %), respectively; while minimum moisture content (8.59 and 8.56 %) was recorded in vacuum packed bags, kept at room temperature and cold storage, respectively and it did not differ significantly to each other. The values of moisture content in gunny bags at room temperature was on par with high density polythene bags at cold storage at all the stages of storage. A similar trend was observed even upto 18 months of storage. At 18 months of storage, the minimum moisture content (8.41 and 8.39 %) was observed in vacuum packed seeds stored at cold storage and room temperature while the maximum values of moisture content (13.94

and 11.33 %) were recorded in gunny bags and high density polythene bags at cold storage followed by room temperature (10.53 and 9.70 %), respectively. It is clear from the results that significantly higher moisture content was observed in gunny bags and high density polythene bags stored under in cold storage at all the stages of storage upto 18 months and less fluctuation in moisture content was observed in cold storage. These results are in agreement with the findings of Dadlani and Veena[14], Gurmitsingh and Hari Singh[18], Remya[32] in chilli powder, Roshany[33] in whole chilli and Monira *et al*[22]., in soybean storability for longer period.

Electrical conductivity (%)

The electrical conductivity (dSm^{-1}) of groundnut seeds differed significantly between the treatments during storage period (Table 7). The electrical conductivity of vacuum packed seeds was lower and a slow increase with an advancement in storage period, as compared to gunny bags as well as high density polythene packed seeds at room temperature. At 18 months of storage, the vacuum packed seeds recorded significantly lower values of electrical conductivity (0.429 and 0.435 dSm^{-1}) at cold storage and room temperature, as compared to all other treatments significantly higher values of electrical conductivity (0.604 dSm^{-1}) were recorded in gunny bags at room temperature, and it was onpar with high density polythene bags (0.580 dSm^{-1}). It is clear that the vacuum packed seeds could maintain significantly lower values of electrical conductivity while, the higher values of electrical conductivity were recorded in cloth bags followed by high density polythene bags at all the stages of storage. The values of electrical conductivity were varied significantly in gunny bags as well as in high density polythene bags upto 18 months of storage. Similar results were obtained by Raiker *et al*[29]., in rice, Narayanaswamy *et al*[23].,in groundnut, Nataraj *et al*[24]., in sunflower, Ravi Hunje *et al*[31]., in chilli and Asha[7] in maize seeds.

Table 1: Influence of packaging and storage conditions on germination (%) at different time intervals of storage in groundnut seeds

Treatments	Storage period (months)									
	0	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**
T_1 – HDPE (CS)	95.8 (78.12)	94.1 (75.90)	92.2 (73.56)	90.3 (71.86)	86.8 (68.56)	80.6 (63.89)	74.7 (59.76)	67.3 (55.12)	60.7 (51.14)	56.7 (48.81)
T_2 – HDPE (RT)	95.8 (78.12)	93.0 (74.59)	90.7 (72.58)	87.7 (69.41)	80.3 (63.65)	71.3 (57.61)	66.0 (54.31)	60.7 (51.14)	56.7 (48.81)	51.0 (45.55)
T_3 – Gunny bag (CS)	95.8 (78.12)	93.3 (75.01)	91.3 (72.85)	88.6 (70.30)	81.3 (64.38)	73.3 (58.89)	67.3 (55.12)	61.3 (51.53)	58.7 (49.97)	52.8 (46.13)
T_4 – Gunny bag (RT)	95.8 (78.12)	92.3 (73.90)	89.7 (71.43)	84.7 (66.93)	74.3 (59.55)	66.0 (54.31)	60.7 (51.14)	56.5 (48.81)	51.6 (45.75)	49.3 (44.60)
T_5 – Vacuum packed (CS)	95.8 (78.12)	95.4 (77.64)	94.6 (76.54)	93.8 (75.55)	92.7 (74.26)	91.7 (73.22)	91.0 (72.53)	90.4 (71.86)	89.7 (71.22)	89.2 (70.77)
T_6 – Vacuum packed (RT)	95.8 (78.12)	95.2 (79.17)	94.4 (77.02)	93.6 (75.32)	92.0 (73.56)	91.3 (72.85)	90.7 (72.20)	89.6 (71.45)	88.9 (70.74)	88.8 (70.53)
S.Em(±)	**0.31**	**0.87**	**1.42**	**0.27**	**0.49**	**0.54**	**0.51**	**0.94**	**1.31**	**1.06**
C. D. (1%)	**NS**	**NS**	**NS**	**0.81**	**1.46**	**1.62**	**1.51**	**2.80**	**3.90**	**3.15**

Figures in parenthesis are Arcsine values
HDPE = High density polythene CS = Cold storage
NS = Non significant RT = Room temperature
(Minimum seed certification standards as per Central Seed Certification Board (CSCB), GOI Norms = 70%)

Table 2: Influence of packaging and storage conditions on root length (cm) at different time intervals of storage in groundnut seeds

Treatments	Storage period (months)									
	0	2	4	6	8	10	12	14	16	18
T_1 – HDPE (CS)	13.07	12.97	12.87	12.77	12.53	12.33	12.07	11.06	10.13	9.97
T_2 – HDPE (RT)	13.07	12.82	12.80	12.68	12.34	12.13	11.87	10.97	9.30	9.23
T_3 – Gunny bag (CS)	13.07	12.93	12.92	12.74	12.47	12.27	11.97	10.33	10.00	9.73
T_4 – Gunny bag (RT)	13.07	12.76	12.73	12.63	12.17	12.00	11.57	10.13	9.20	9.10
T_5 – Vacuum packed (CS)	13.07	13.05	13.03	12.97	12.90	12.87	12.83	12.73	12.67	12.57
T_6 – Vacuum packed (RT)	13.07	13.04	13.00	12.93	12.83	12.80	12.75	12.63	12.63	12.53
S.Em(±)	**0.15**	**0.22**	**0.23**	**0.03**	**0.05**	**0.07**	**0.06**	**0.04**	**0.05**	**0.03**
C. D. (1%)	**NS**	**NS**	**NS**	**0.08**	**0.15**	**0.21**	**0.17**	**0.12**	**0.16**	**0.08**

Table 3: Influence of packaging and storage conditions on shoot length (cm) at different time intervals of storage in groundnut seeds

Treatments	Storage period (months)									
	0	2	4	6	8	10	12	14	16	18
T_1 – HDPE (CS)	9.30	9.20	9.17	9.07	8.90	8.63	8.23	7.90	7.57	7.03
T_2 – HDPE (RT)	9.30	9.16	8.93	8.87	8.67	8.20	7.63	7.77	7.37	6.63
T_3 – Gunny bag (CS)	9.30	9.19	9.07	9.03	8.87	8.47	8.10	7.83	7.60	6.80
T_4 – Gunny bag (RT)	9.30	9.13	8.90	8.77	8.63	8.07	7.53	7.67	7.27	6.37
T_5 – Vacuum packed (CS)	9.30	9.30	9.23	9.20	9.07	8.98	8.90	8.85	8.78	8.70
T_6 – Vacuum packed (RT)	9.30	9.28	9.20	9.11	9.03	8.93	8.83	8.82	8.75	8.67
S.Em(±)	**0.19**	**0.13**	**0.15**	**0.05**	**0.08**	**0.09**	**0.10**	**0.04**	**0.03**	**0.05**
C. D. (1%)	**NS**	**NS**	**NS**	**0.13**	**0.24**	**0.26**	**0.29**	**0.11**	**0.08**	**0.15**

HDPE = High density polythene CS = Cold storage
NS = Non significant RT = Room temperature

Table 4: Influence of packaging and storage conditions on seedling vigor index (SVI) at different time intervals of storage in groundnut seeds

Treatments	Storage period (months)									
	0	2	4	6	8	10	12	14	16	18
T_1 – HDPE (CS)	2142	2086	2027	1972	1858	1691	1516	1277	1074	963
T_2 – HDPE (RT)	2142	2043	1970	1888	1687	1450	1287	1137	944	809
T_3 – Gunny bag (CS)	2142	2065	2010	1930	1735	1520	1351	1114	1032	860
T_4 – Gunny bag (RT)	2142	2021	1939	1812	1546	1325	1159	1009	845	763
T_5 – Vacuum packed (CS)	2142	2133	2107	2079	2036	2003	1978	1950	1923	1896
T_6 – Vacuum packed (RT)	2142	2124	2096	2062	2012	1985	1957	1923	1896	1882
S.Em (±)	**19.6**	**31.6**	**37.4**	**8.5**	**14.5**	**13.2**	**14.9**	**20.3**	**27.2**	**20.8**
C. D. (1%)	**NS**	**NS**	**NS**	**25.2**	**42.9**	**39.3**	**44.2**	**60.4**	**80.9**	**61.7**

HDPE = High density polythene CS = Cold storage
NS = Non significant RT = Room temperature

Table 5: Influence of packaging and storage conditions on seedling dry weight (mg) at different time intervals of storage in groundnut seeds

Treatments	Storage period (months)									
	0	2	4	6	8	10	12	14	16	18
T_1 – HDPE (CS)	321.0	318.9	312.3	296.0	287.3	279.6	252.0	237.3	207.7	170.3
T_2 – HDPE (RT)	321.0	315.7	308.5	292.8	277.7	269.4	240.1	231.6	197.8	152.3
T_3 – Gunny bag (CS)	321.0	317.5	310.3	295.3	281.4	277.0	245.3	234.3	200.7	163.0
T_4 – Gunny bag (RT)	321.0	311.8	307.5	292.3	274.7	263.3	236.4	226.4	194.3	147.7
T_5 – Vacuum packed (CS)	321.0	320.3	318.7	315.0	311.5	307.1	303.7	299.0	296.8	291.0
T_6 – Vacuum packed (RT)	321.0	319.7	316.9	312.3	309.3	305.3	302.5	297.4	293.0	289.3
S.Em (±)	**0.41**	**8.42**	**9.56**	**0.90**	**2.43**	**1.67**	**1.05**	**0.62**	**0.63**	**1.48**
C. D. (1%)	**NS**	**NS**	**NS**	**2.68**	**7.23**	**4.96**	**3.13**	**1.85**	**1.87**	**4.38**

HDPE = High density polythene CS = Cold storage
NS = Non significant RT = Room temperature

Table 6: Influence of packaging and storage conditions on moisture content (%) at different time intervals of storage in groundnut seeds

Treatments	Storage period (months)									
	0	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**
T_1 – HDPE (CS)	8.52	12.37	12.53	12.30	12.50	12.40	12.07	11.70	11.50	11.33
T_2 – HDPE (RT)	8.52	10.30	10.23	10.20	11.40	11.37	11.03	10.01	9.90	9.70
T_3 – Gunny bag (CS)	8.52	14.03	15.70	14.67	14.47	14.37	14.33	14.30	14.32	13.93
T_4 – Gunny bag (RT)	8.52	12.77	12.50	12.13	12.90	12.89	12.73	12.01	10.83	10.53
T_5 – Vacuum packed (CS)	8.52	8.59	8.58	8.56	8.53	8.51	8.50	8.49	8.47	8.41
T_6 – Vacuum packed (RT)	8.52	8.56	8.54	8.53	8.52	8.50	8.49	8.47	8.45	8.39
S.Em (±)	**0.01**	**0.21**	**0.09**	**0.16**	**0.10**	**0.09**	**0.10**	**0.09**	**0.10**	**0.16**
C. D. (1%)	**NS**	**0.61**	**0.28**	**0.49**	**0.29**	**0.27**	**0.29**	**0.27**	**0.30**	**0.46**

HDPE = High density polythene CS = Cold storage
NS = Non significant RT = Room temperature

Table 7: Influence of packaging and storage conditions on electrical conductivity (EC, dSm^{-1}) at different time intervals of storage in groundnut seeds

Treatments	Storage period (months)									
	0	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**
T_1 – HDPE (CS)	0.397	0.399	0.403	0.410	0.416	0.426	0.444	0.469	0.502	0.530
T_2 – HDPE (RT)	0.397	0.402	0.408	0.414	0.433	0.455	0.470	0.499	0.534	0.580
T_3 – Gunny bag (CS)	0.397	0.401	0.406	0.416	0.428	0.438	0.451	0.479	0.510	0.546
T_4 – Gunny bag (RT)	0.397	0.405	0.410	0.421	0.443	0.458	0.494	0.512	0.546	0.604
T_5 – Vacuum packed (CS)	0.397	0.397	0.399	0.402	0.405	0.408	0.410	0.416	0.421	0.429
T_6 – Vacuum packed (RT)	0.397	0.398	0.400	0.404	0.406	0.410	0.413	0.421	0.427	0.435
S.Em(±)	**0.001**	**0.016**	**0.013**	**0.001**	**0.002**	**0.002**	**0.008**	**0.002**	**0.002**	**0.005**
C. D. (1%)	**NS**	**NS**	**NS**	**0.002**	**0.006**	**0.005**	**0.024**	**0.005**	**0.006**	**0.014**

HDPE = High density polythene CS = Cold storage
NS = Non significant RT = Room temperature

CONCLUSION

Seed quality deterioration is an inexorable and an irreversible process. The seed quality and viability of groundnut seeds are subjected to variations during storage conditions and it has been found that the life span of seeds depends on moisture content of the seeds, relative humidity, temperature, light and oxygen content under which the seeds are stored. It has been found in the present investigation that it is possible to extend the shelf life of groundnut seeds up to 18 months without deterioration in seed quality parameters *viz.*, germination per cent, root and shoot length, seedling dry weight and seedling vigour index and electrical conductivity by storing them under vacuum packaging. Since seed is an important input in agriculture which determines not only the production but also the productivity, it is essential to maintain the seed quality as well as seed vigor for longer time.

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