

## Effect of accelerated ageing on seed storage potential of soybean [*Glycine max* (L.) Merrill]

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(Received : June 05, 2014; Accepted : October 04, 2014)

### ABSTRACT

Freshly harvested seeds of soybean cultivars, JS-335 and DS-228 were stored in gunny bags and polylined gunny bags as part of storage study. Simultaneously seeds were exposed to accelerated ageing test at  $41 \pm 2^\circ\text{C}$  temperature and  $98 \pm 2\%$  RH to study viability and vigour. The observations viz., germination percentage, root and shoot length of seedling, vigour index I and II, dry matter content of seedlings, moisture content, electrical conductivity and seed mycoflora were recorded at 24 hrs interval upto 168 hrs in accelerated ageing. At 24 hrs of accelerated ageing, germination percentage enhanced over the control and the quality deterioration of seeds was very fast after 96 hrs of ageing. The seed quality of DS-228 deteriorated earlier than JS-335 due to ageing treatments. Germination percent and moisture content had positive correlation with the viability during test and storage, whereas the electrical conductivity and number of seeds affected by fungus were negatively associated with seed viability. Thus, the present study indicates that the four days accelerated aged seeds predict the storability of 10 months gunny bag and 12 months polylined gunny bag stored seeds of soybean, JS-335 and DS-228.

**Key words:** Accelerated ageing test, Germination, Soybean, Storage potential

Soybean (*Glycine max*. (L.) Merrill) is one of the important pulse and oilseed crop of the world. It has become miracle crop of the twentieth century and designated as "Golden Bean". The seeds attain highest level of vigour and viability at the time of maturity in which deterioration occurs during storage which is associated with delayed germination, reduced seedling growth, vigour, loss of germination and decreased tolerance to adverse conditions. The rate of seed quality deterioration is greatly increased by exposing seeds to high humidity and temperature conditions. The potential storage life of seeds varies from species to species among the varieties. Accelerated ageing is the most widely used stress test to predict the storability of crop seeds in short period.

Neither the losses in germination percentage can be stopped nor can they be reverted during storage. However, the process of seed quality deterioration can be minimized with optimum storage condition. The most important factor affecting the viability and vigour of seeds during storage is seed moisture, relative humidity and temperature. Thus there

is need to understand the genotypic variability in terms of viability of seeds during storage. In view of the above circumstances present investigation was undertaken to study the seed quality parameters as influenced by accelerated ageing and to predict the storability of soybean seed.

### MATERIALS AND METHODS

#### Experimental materials

The freshly harvested seeds of soybean cultivars JS-335 and DS-228 were obtained from Mahatma Phule Krishi Vidyapeeth, Rahuri during *kharif* 2006-07 and these had germination percent above seed certification standards. The seeds were stored in ambient condition in gunny bag and polylined gunny bag containers.

#### Treatments

The seeds of soybean cultivars having germination percent above seed certification standard were used for accelerated ageing treatments, at Seed Technology Research Unit, M.P.K.V., Rahuri during Feb. 2007 to April 2008. For this, freshly harvested seeds of cultivars JS-335 and DS-228 were subjected to  $41 \pm 1^\circ\text{C}$  temperature and  $98 \pm 2\%$  RH for a period of 0 to 168 hrs in an incubator. The treatment details are as follows: T<sub>1</sub>-0 hr (non ageing), T<sub>2</sub>-24 hrs, T<sub>3</sub>-48 hrs, T<sub>4</sub>-72 hrs, T<sub>5</sub>-96 hrs, T<sub>6</sub>-120 hrs, T<sub>7</sub>-144 hrs, and T<sub>8</sub>-168 hrs. The seeds were taken after each treatment for testing the seed quality parameters.

#### Observations recorded

Germination percentage (Anonymous, 1999), root shoot length (cm), dry matter content (g), and vigour index-I and II were determined by using the formula given by Abdul Baki and Anderson (1973) [Vigour index I = Average Seedling Length  $\times$  Germination percentage; Vigour index II = Average Seedling dry matter  $\times$  Germination percentage]. The moisture content was calculated on the wet weight basis by following Roberts and Roberts (1972), electrical conductivity (mm hos/cm/g) (Loeffler *et al.*, 1988), and seed mycoflora (%). The seed health was determined by blotter test to detect the presence of seed borne fungi of soybean seed (Anonymous, 1999).

### Statistical analysis

The data obtained from all the parameters were analyzed using Factorial Completely Randomized Design (FCRD) as described by Snedecor and Cochran (1967). For analyzing data on germination percent, moisture content and seed mycoflora corresponding arc-sin values have been taken. Whenever, the results were significant the critical differences (C.D.) at 5 per cent level of significance were calculated and used for comparing the treatments.

### RESULTS AND DISCUSSION

The genotype JS-335 recorded the highest germination percentage (69.87 %) as compared to genotype DS-228 (66.95 %) irrespective of accelerated ageing periods (Table 1). due to the effect of seed ageing After 96 hours of accelerated ageing, there was sharp decline in germination percentage (Table 2). The germination percentage remained above minimum seed certification standard (MSCS) up to 72 hrs. of accelerated ageing. The higher germination percentage (97.16 %) was recorded at 24 hrs accelerated ageing period whereas the lowest

germination (8.33 %) was observed at 168 hrs accelerated ageing period (Table 2).

It is evident from Table 3 that as the duration of accelerated ageing increased, the per cent germination of both the genotype decreased throughout the entire duration of accelerated ageing. Among the treatment, 24 hrs accelerated ageing recorded high germination percentage i.e. 98.33 and 96.00 in genotype JS-335 and DS-228, respectively than the other treatment combinations because exposure period to seed ageing was less compared to other treatments. The present results are also in agreement with Shantappa *et al.* (2006) in bitter gourd, Singh and Kanaujia (2006) in rice and Geeta Bassi *et al.* (2007) in pea.

The genotype JS-335 had significantly higher root-shoot length (21.64 cm) than genotype DS-228 (19.07 cm) irrespective of accelerated ageing periods (Table 1). There was reduction in root-shoot length of seedlings with subsequent increase in accelerated ageing period. The higher root-shoot length (31.00 cm) was recorded at 24 hrs. accelerated ageing period. Whereas, lowest root-shoot length (6.25 cm) was recorded at 168 hrs of accelerated ageing (Table 2).

**Table 1. Response of soybean cultivars to AAT for different seed quality parameters**

| Variety   | Germination (%)  | Root shoot length (cm) | Dry matter content (g) | Vigour index -I | Vigour index-II | Moisture content (%) | Electrical conductivity (m mhos/cm /g) | Seed mycoflora (%) |
|-----------|------------------|------------------------|------------------------|-----------------|-----------------|----------------------|--|--------------------|
| JS-335    | 69.87<br>(59.48) | 21.64                  | 9.40                   | 1752.76         | 705.1           | 14.12<br>(21.94)     | 0.799                                  | 48.75<br>(44.92)   |
| DS-228    | 66.95<br>(55.42) | 19.07                  | 8.73                   | 1515.87         | 637.80          | 14.27<br>(22.04)     | 0.871                                  | 51.66<br>(47.43)   |
| Mean      | (57.45)          | 20.36                  | 9.07                   | 1634.31         | 671.45          | 14.20<br>(21.99)     | 0.835                                  | 50.20<br>(46.18)   |
| S.E. ±    | (0.921)          | 0.35                   | 0.07                   | 26.19           | 6.42            | 0.07<br>(0.05)       | 0.006                                  | 1.38<br>(1.13)     |
| CD at 5 % | (1.35)           | 1.03                   | 0.21                   | 75.57           | 18.53           | 0.21<br>(0.16)       | 0.017                                  | 3.98<br>(3.28)     |

**Table 2. Effect of accelerated ageing periods/hours on different seed quality parameters of soybean seeds**

| Accelerated ageing treatments (hrs) | Germination (%)  | Root shoot length (cm) | Dry matter content (g) | Vigour index -I | Vigour index-II | Moisture content (%) | Electrical conductivity (m mhos/cm /g) | Seed mycoflora (%) |
|-------------------------------------|------------------|------------------------|------------------------|-----------------|-----------------|----------------------|--|--------------------|
| Initial 0                           | 95.83<br>(78.43) | 28.73                  | 11.07                  | 2755.05         | 1056.56         | 8.64<br>(17.10)      | 0.418                                  | 18.33<br>(24.96)   |
| 24 hrs                              | 97.16<br>(80.59) | 31.00                  | 11.60                  | 3009.01         | 1127.04         | 10.79<br>(19.20)     | 0.460                                  | 25.00<br>(29.89)   |
| 48 hrs                              | 94.00<br>(75.85) | 26.36                  | 10.26                  | 2479.73         | 965.45          | 12.54<br>(20.74)     | 0.583                                  | 36.66<br>(37.19)   |
| 72 hrs.                             | 86.00<br>(63.03) | 20.60                  | 9.20                   | 1898.11         | 792.75          | 14.00<br>(21.99)     | 0.705                                  | 45.00<br>(42.15)   |
| 96 hrs.                             | 78.83<br>(62.62) | 19.71                  | 8.63                   | 1554.98         | 680.13          | 14.31<br>(22.23)     | 0.829                                  | 46.66<br>(43.07)   |
| 120 hrs.                            | 55.66<br>(48.26) | 17.15                  | 8.08                   | 957.7           | 450.21          | 15.55<br>(23.17)     | 1.103                                  | 56.66<br>(48.84)   |
| 144 hrs.                            | 31.00<br>(33.80) | 11.56                  | 7.88                   | 361.53          | 244.70          | 18.10<br>(25.19)     | 1.260                                  | 78.33<br>(62.57)   |
| 168 hrs.                            | 8.33<br>(17.02)  | 6.25                   | 5.86                   | 58.42           | 54.75           | 19.60<br>(26.29)     | 1.323                                  | 95.00<br>(80.78)   |
| S.E. ±                              | 1.84             | 0.71                   | 0.14                   | 52.38           | 12.85           | 0.11                 | 0.0125                                 | 2.27               |
| CD at 5 %                           | 2.71             | 2.06                   | 0.42                   | 151.14          | 37.07           | 0.33                 | 0.0359                                 | 6.57               |

The root shoot length of seedlings (Table 3) revealed that as the accelerated ageing duration increased there was drastic reduction in root shoot length of seedlings. This might be due to the deterioration of seeds due to ageing process. The genotype JS-335 and DS-228 recorded highest (31.96 and 30.03 cm) root shoot length at 24 hrs of accelerated ageing than the other ageing treatment. After 72 hrs. of accelerated ageing, there was a sharp decline in the root shoot length. The lowest root shoot length was recorded at 168 hrs of accelerated ageing in both the varieties JS-335 (31.96 cm) and DS-228 (30.03 cm), respectively. Among the two genotypes, JS-335 recorded highest root shoot length, than the genotype DS-228.

The dry matter content of seedlings was significantly influenced due to genotypes irrespective of accelerated ageing periods. The genotype JS-335 exhibited higher dry matter content (9.40 g) as compared to genotype DS-228 (8.73 g) (Table 1). The higher dry matter content (11.60 g) of seedling was recorded at 24 hrs. of accelerated ageing whereas, the lowest dry matter content (5.86 g) of seedlings was recorded at 168 hrs. of accelerated ageing (Table 2). There was significant reduction in the dry matter content of seedling with increase in the duration of accelerated ageing. At 24 hrs of accelerated ageing higher dry matter content of seedling was observed as compared to other accelerated ageing treatments which was 12.37 g. in the genotype JS-335 and 10.84 g in DS-228. This might be due to the higher root shoot length at one day accelerated ageing treatment.

The genotype JS-335 recorded the higher vigour index-I (1752.76) than genotype DS-228 (1515.87), irrespective of accelerated ageing periods (Table 1). The higher vigour index-

I (3009.01) was recorded at 24 hrs. of accelerated ageing. However, the lowest vigour index-I (58.42) was recorded at 168 hrs of accelerated ageing (Table 2).

The performance of seed vigour index-I (Table 3) indicates that there was a gradual decrease in vigour index-I of both the genotypes upto 96 hrs of accelerated ageing. The genotype JS-335 and DS-228 recorded highest vigour index-I (3138.03 and 2880.00), than the other treatment. There was a linear decrease in vigour index-I with an advancement of accelerated ageing period. It might have led to various biochemical changes in sub cellular system and membrane degradation which affected the vigour index-I since seeds were exposed to highly adverse condition of temperature and relative humidity. Similar results were reported in soybean (Dumbre, 2007), field bean (Narayanswamy and Reddy, 1996), bitter gourd (Shantappa *et al.*, 2006) and rice (Singh and Kanujia, 2006).

The genotype JS-335 recorded the higher vigour index-II (705.1) than the genotype DS-228 (637.8) irrespective of accelerated ageing period. With the increase in accelerated ageing period, there was a gradual decline in the vigour index-II. The higher vigour index-II (1127.04) was recorded at 24 hrs. of accelerated ageing, whereas the lowest vigour index-II (54.75) was recorded at 168 hrs of accelerated ageing (Table 2). At 24 hrs of accelerated ageing highest vigour index-II was recorded in both the genotypes, JS-335 (1216.13) and DS-228 (1037.96) as compared to other treatments. After 96 hrs of accelerated ageing there was a sharp decline the vigour index-II in both the genotype. The genotype DS-228 recorded the higher moisture content (14.27 %) than JS-335 (14.12 %) irrespective of accelerated ageing periods (Table 1). The

**Table 3. Interaction effect of cultivars and accelerated ageing treatment on different seed quality parameters of soybean seeds**

| Accelerated ageing treatment (hrs) | Germination (%)          |                          | Root shoot length (cm)   |                          | Dry matter content (g)   |                          | Vigour index -I          |                          | Vigour index-II          |                          | Moisture content (%)     |                          | Electrical conductivity (m mhos/cm /g) |                          | Seed mycoflora (%)       |                          |
|------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|
|                                    | JS-335 (V <sub>1</sub> ) | DS-228 (V <sub>2</sub> ) | JS-335 (V <sub>1</sub> ) | DS-228 (V <sub>2</sub> ) | JS-335 (V <sub>1</sub> ) | DS-228 (V <sub>2</sub> ) | JS-335 (V <sub>1</sub> ) | DS-228 (V <sub>2</sub> ) | JS-335 (V <sub>1</sub> ) | DS-228 (V <sub>2</sub> ) | JS-335 (V <sub>1</sub> ) | DS-228 (V <sub>2</sub> ) | JS-335 (V <sub>1</sub> )               | DS-228 (V <sub>2</sub> ) | JS-335 (V <sub>1</sub> ) | DS-228 (V <sub>2</sub> ) |
| Initial                            | 97.33 (80.62)            | 94.33 (76.24)            | 29.53 (29.53)            | 27.93 (27.93)            | 11.53 (11.53)            | 10.50 (10.50)            | 2874.76                  | 2635.33                  | 1122.43                  | 990.70                   | 8.63 (17.08)             | 8.65 (17.12)             | 0.403                                  | 0.432                    | 13.33 (21.14)            | 23.33 (28.78)            |
| 24 hrs                             | 98.33 (82.66)            | 96.00 (78.52)            | 31.96                    | 30.03                    | 12.37                    | 10.84                    | 3138.03                  | 2880.00                  | 1216.13                  | 1037.96                  | 10.84 (19.24)            | 10.74 (19.15)            | 0.447                                  | 0.472                    | 26.66 (30.99)            | 23.33 (28.78)            |
| 48 hrs                             | 94.66 (76.66)            | 93.33 (75.04)            | 28.00                    | 24.73                    | 10.70                    | 9.83                     | 2650.30                  | 2309.16                  | 1013.03                  | 917.86                   | 12.71 (20.87)            | 12.36 (20.61)            | 0.558                                  | 0.607                    | 33.33 (35.24)            | 40.00 (39.14)            |
| 72 hrs                             | 86.33 (68.31)            | 85.66 (67.75)            | 24.20                    | 19.93                    | 9.23                     | 9.16                     | 2089.40                  | 1706.16                  | 797.13                   | 788.36                   | 14.41 (22.32)            | 13.58 (21.66)            | 0.683                                  | 0.727                    | 46.66 (43.07)            | 43.33 (41.15)            |
| 96 hrs.                            | 79.66 (63.19)            | 78.0 (62.75)             | 21.26                    | 18.18                    | 8.56                     | 8.70                     | 1694.16                  | 1415.80                  | 682.33                   | 677.93                   | 14.56 (22.43)            | 14.06 (22.02)            | 0.802                                  | 0.857                    | 43.33 (41.15)            | 50.00 (45.00)            |
| 120 hrs                            | 57.33 (49.22)            | 54.00 (47.30)            | 18.56                    | 15.73                    | 8.03                     | 8.13                     | 1063.26                  | 852.13                   | 460.80                   | 439.63                   | 15.24 (22.97)            | 15.87 (23.36)            | 1.085                                  | 1.120                    | 56.66 (48.84)            | 56.67 (48.84)            |
| 144 hrs                            | 34.00 (35.66)            | 28.00 (31.94)            | 12.53                    | 10.60                    | 7.97                     | 7.80                     | 427.40                   | 295.66                   | 270.86                   | 218.53                   | 17.25 (24.55)            | 18.95 (25.84)            | 1.186                                  | 1.333                    | 76.66 (61.21)            | 80.00 (63.93)            |
| 168 hrs.                           | 11.33 (19.53)            | 6.33 (14.51)             | 7.10                     | 5.40                     | 6.87                     | 4.87                     | 84.77                    | 32.06                    | 78.10                    | 31.40                    | 19.27 (26.03)            | 19.94 (26.54)            | 1225                                   | 1422                     | 93.33 (77.71)            | 96.67 (83.85)            |
| S.E. ±                             | 2.60                     |                          | 1.01                     |                          | 0.20                     |                          | 74.08                    |                          | 18.17                    |                          | 0.160                    |                          | 0.0176                                 |                          | 3.22                     |                          |
| CD at 5 %                          | 3.83                     |                          | 2.92                     |                          | 0.598                    |                          | 213.74                   |                          | 52.43                    |                          | 0.462                    |                          | 0.050                                  |                          | 9.29                     |                          |

moisture content of seed was directly proportional to the accelerated ageing period. There was a rapid increase in moisture content up to 72 hrs. of accelerated ageing. Thereafter the increase in moisture content slowed down upto 168 hrs. of accelerated ageing. The highest moisture content (19.60%) was recorded at 168 hrs of accelerated ageing, whereas the lowest moisture content (8.64%) was recorded at 0 hrs followed by 24 hrs (10.79 %) of accelerated ageing period (Table 2). It was observed that there was an increase in the moisture content of seed as the period of accelerated ageing increased. At 168 hrs of accelerated ageing period higher moisture content was recorded i.e. 19.27% in JS-335 and 19.94 per cent in DS-228 than the control. This might be due to exposure of seed to  $98 \pm 2\%$  RH for 168 hrs. Veselova (2003) reported that the moisture content in seeds increased as increase in ageing period.

A significant effect of genotype was also observed on electrical conductivity irrespective of the accelerated ageing period (Table 1). Higher electrical conductivity (0.871 mmhos/cm/g) of seed leachate was recorded in the genotype DS-228 as compared to JS-335 (0.799 mmhos/cm/g). The electrical conductivity of seed leachate significantly increased with an increase in accelerated ageing period. The highest electrical conductivity (1.323 mmhos/cm/g) was recorded at 168 hrs of accelerated ageing. However, the lowest electrical conductivity (0.418 mmhos/cm/g) was recorded at initial stage and 24 hrs (0.460 mmhos/cm/g) of accelerated ageing (Table 2). The lowest electrical conductivity was recorded in at 24 hrs of accelerated aging in both the genotypes; JS-335 (0.403 mmhos/cm/g) and DS-228 (0.432 mmhos/cm/g). The electrical conductivity of seed increased with increase in accelerated aging period. The highest electrical conductivity was recorded

at 168 hrs of accelerated aging in the variety of JS-335 (1.86 mmhos/cm/g) and DS-228 (1.33 mmhos/cm/g), respectively (Table 3). It was observed that with an increase in accelerated ageing period from 48 hrs onwards there was an increase in the EC of seed leachate than control. This might be due to the loss in membrane integrity during ageing process leading to loss of electrolytes in to the imbibing medium. Negative correlation had been registered between viability and vigour with electrical conductivity values (Dahiya, 2005). Similar results were reported in field bean (Narayanswamy and Reddy, 1996), bitter gourd (Shantappa *et al.*, 2006) and pea (Geeta and Mohansingh, 2007).

The infestation of mycoflora on seeds was minimum i.e. 13.33 per cent in JS-335 and 23.33 per cent in DS-228 at initial stage, which increased with the advancement in accelerated ageing period. The 168 hrs of accelerated aged seeds recorded maximum infestation of mycoflora in both the cultivars. Similar result were reported in cowpea (Sharma *et al.*, 1988) and field bean (Narayanswamy and Reddy, 1996) where it was observed that the fungal infestation was minimum in fresh seeds which increased as ageing period increase.

#### *Correlation between AAT and Natural ageing for predicting the storability*

At 96 hrs (4 days) accelerated ageing, 79.66 % germination was recorded while nearly similar germination per cent (73.33 and 73.00%) was recorded at 10 and 12 months of natural ageing of JS-335 seed stored in gunny bag and polylined gunny bag, respectively (Table 5). The four days accelerated ageing of seed predicted the storability of 10 months and 12 months in gunny and polylined gunny bag,

**Table 4. Germination percentage as influenced by accelerated ageing and natural ageing in soybean seeds (JS-335)**

| Accelerated aged seeds of JS-335 |                 | Naturally aged seeds of JS-335 |                 |                     |
|----------------------------------|-----------------|--------------------------------|-----------------|---------------------|
| Ageing period (hrs)              | Germination (%) | Storage period month           | Germination (%) |                     |
|                                  |                 |                                | Gunny bag       | Polylined gunny bag |
| Control (0 hr)                   | 97.33 (80.62)   | Control                        | 97.33 (80.62)   | 97.33 (80.62)       |
| 24 hrs                           | 98.33 (82.66)   | 2                              | 94.33 (76.31)   | 95.00 (77.25)       |
| 48 hrs                           | 94.66 (76.66)   | 4                              | 92.00 (73.65)   | 93.00 (74.68)       |
| 72 hrs                           | 86.33 (68.32)   | 6                              | 86.33 (68.31)   | 92.00 (73.59)       |
| 96 hrs                           | 79.66 (63.19)   | 8                              | 80.66 (63.29)   | 90.00 (71.62)       |
| 120 hrs                          | 57.33 (49.22)   | 10                             | 73.33 (58.99)   | 86.00 (68.36)       |
| 144 hrs                          | 34.00 (35.66)   | 12                             | 62.33 (52.14)   | 73.00 (58.72)       |
| 168 hrs                          | 11.33 (19.53)   | 14                             | 46.00 (42.70)   | 65.66 (54.14)       |

**Table 5. Germination percentage as influenced by accelerated ageing and natural ageing in soybean seeds (DS-228)**

| Accelerated aged seeds of DS-228 |                 | Naturally aged seeds of DS-228 |                 |                     |
|----------------------------------|-----------------|--------------------------------|-----------------|---------------------|
| Ageing period (hrs)              | Germination (%) | Storage Period (month)         | Germination (%) |                     |
|                                  |                 |                                | Gunny bag       | Polylined gunny bag |
| Control (0 hr)                   | 94.33 (76.24)   | Control                        | 94.33 (76.24)   | 94.33 (76.24)       |
| 24 hrs                           | 96.00 (78.52)   | 2                              | 91.00 (72.61)   | 92.66 (74.32)       |
| 48 hrs                           | 93.33 (75.04)   | 4                              | 87.00 (68.87)   | 89.00 (70.64)       |
| 72 hrs                           | 85.66 (67.75)   | 6                              | 85.33 (67.50)   | 87.33 (69.15)       |
| 96 hrs                           | 78.00 (62.04)   | 8                              | 78.00 (62.09)   | 85.66 (67.75)       |
| 120 hrs                          | 54.00 (47.30)   | 10                             | 69.00 (56.18)   | 77.66 (65.55)       |
| 144 hrs                          | 28.00 (31.94)   | 12                             | 57.00 (49.02)   | 68.00 (61.81)       |
| 168 hrs                          | 6.33 (14.51)    | 14                             | 35.33 (36.45)   | 60.00 (55.55)       |

respectively. Hence, four days of accelerated ageing is equal to 10 month of store seeds in gunny bag and 12 month stored seeds in polylined gunny bag in genotype JS-335.

At 96 hrs (four days) accelerated ageing, the seeds recorded 78.00 per cent germination. However nearly similar germination per cent was recorded with 8 months (78.00%) and 10 months (77.66%) of natural aged seeds of genotype DS-228 stored in gunny bag and polylined gunny bag (Table 5). Therefore, the four days accelerated aged seed can predict the storability of 8 months and 10 months in gunny bag and polylined gunny bag, respectively. Hence, four days of accelerated ageing treatment is equal to 8 month stored seeds in gunny bag and 10 month stored seeds in polylined gunny bag in genotype DS-228.

From the above study it could be concluded that all the seed quality parameters of soybean *viz.*, germination percent, root shoot length, vigour index, dry matter content, moisture content, electrical conductivity and seed mycoflora differed significantly due to accelerated ageing treatment and different storage periods. The accelerated ageing treatment maintains the germination above MSCS (70%) up to 96 hrs, irrespective of the genotype. But, accelerated ageing treatment of 24 hrs enhanced the germination percentage, root shoot length, vigour index and dry matter content over the control. The four days accelerated aged seeds of soybean can predict the storability for 10 months in gunny bag and 12 months in polyline gunny bag, when stored in ambient conditions.

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