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COMPARATIVE TESTING OF CEREAL CROP HY.BAJRA

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ABSTRACT

The storage condition is most important factor in seed germination. The poor storage condition and relative environmental factors are affects on seed germination of Bajra seeds. The deterioration of seed quality periodically goes on increasing during poor storage conditions. The poor stored seed shows significant affect on the seed germination, mass index, electric conductivity and seed vigour (length). The subjected testing of the some lots of Hy.Bajra was grown in kharif season having location of production center of Baleshwarpuram of Andhra Pradesh state. The seed testing during initial, 3, 6, and 9 month in ambient and control conditions. The three lots were selected from production center to test effective seed germ inability and it's Vigour at regular intervals, i.e. initial to 9 month, i.e. at validity period. The testing of lots according to the International Seed Testing Association and Indian Minimum Seed Certification Standard, The lots parameters tested after 4^{th} day i.e.(initial or first count) as well as 7^{th} day i.e. (final or second count).The parameters were fluctuate and changes showed according to increasing days of intervals, i.e. 1^{st} to 2^{nd} count days. There is no such great variation in germination, but the parameters of Vigour (Mass index, Vigour index (length) significantly reduced in ambient condition from high to low, than that of control condition, the variation increases with increasing day of intervals; which showed effective than the ambient one. It means that the vigour changes according to days intervals (I upto II count) control storage condition is helpful for stable in vigor, seed germ inability and maintaining seed quality of seed lots.

Key words- ***Storage conditions, Temperature, Relative humidity, Seed Germination, Electrical conductivity, Vigour, Seed quality.***

INTRODUCTION

Bajra (Pennisetum americanum) is major cereal crop in worldwide for their nutritional value; it belongs to family graminae. Pearl millet well adapted to high temperature region, low fertile soil with low ph and also have good

drought tolerant. It grows in Africa and Indian subcontinents. The cultivation made in single as well as in mixed cropping system with soybean crop. It cultivated for food and fodder purposes. It enrich with the starch, carbohydrates, Proteins, Vitamins, Fats, Minerals and Calories. It quality which is beneficial to the body, 100 grams of Bajra has the following nutritional values such as energy 360 calories, moisture 12g,protein 12g, fat 5g, mineral 2g, fiber 1 g, carbohydrate 67g, Calcium 42mg, phosphorus 242mg, and iron 8mg.

Seed vigour and viability are most valuable parameters for maintaining the good quality of seed and increasing the longevity and shelf-life of seeds, for this keeping the seeds in good maintained control conditions, in such; way that the deterioration will be less up to the prescribed period or long up to validity period. The adverse conditions made deterioration fast than the stored seeds in control conditions. The seeds of crops affected due to the many store grain pests such as, rice moth (Corcyra cephalonica staint), rice weevil (Sitophilus oryzae), pulse beetle (Bruchus spp.), kharpa beetle (Trogoderma granarium), Indian meal moth (Plodia interpunctella), and flat grain beetle.

The principal object of seed storage is to preserve storage temperature and moisture content on the vigor of economic crops from one season to another. Also prevent seed deterioration from environment and harmful organisms.

Changes occurring in seed during aging are significant as far as seed quality and longevity are concerned and are a consequence of the effects of different storage conditions. The obtained results showed that preservation of seed viability depended on storage condition and duration, as well as plant species. Accelerated aging test can be used to predict the length of storage life of sunflower and soybean seed. In comparison to sunflower seed, soybean seed is more sensitive to damage and reduced germination during storage; Balesevic-Tubic, S., Tatic et al ;(2010) Many investigators reported that the speed of decline They reported that a complete pattern of loss in viability in seed quality is largely dependent on storage could be understood on the basis of seed moisture and temperature, relative humidity, seed moisture content, storage temperature and concluded that adoption of length of storage, type of seed and seed quality . The appropriate storage temperature and moisture control relation between seed deterioration and moisture technique would significantly affect onion seed quality. The seeds harvested in adverse climatic conditions were made infectious easily than harvested at suitable environmental climatic conditions.

Seeds of four vegetable crops; carrot (Daucus carota L. cv Nantes 2-Tito), cucumber (Cucumis sativus L. cv Special), onion (Alium cepa L. cv Red Creole) and tomato (Lycopersicon esculentum Mill. Cv Tanshet Star) were stored under a wide range of temperature (5, 15, 25 and 35°C) and relative humidity (RH) (11.3, 22.5, 32.5, 43.2, 58.4, 75.3 and 84.3%) conditions for various storage periods (1, 3, 6, 9 and 12 months), seeds stored at 35°C had the lowest SGP and GCV and the longest MGT. RH up to 58.4% had no significant effect on SGP while higher levels of RH significantly lowered SGP and MGT. The highest RH levels (75 and 84%) showed an obvious decrease in seed quality by lowering SGP and increasing MGT. Abdullah M. Alhamdan, Abdullah A. Alsadon et.al ;(2011).

The influence of seed storage conditions and different temperatures (5˚C, 10˚C, 15˚C, 20˚C, 25˚C, 30˚C and 26˚C/21˚C) during germination and seedling development on seed germination, shoot length and germination rate of wild oat (Avena fatua L.) was examined. The results also showed that temperature had a significant effect on the percentage of germination and germination rate of A. fatua seeds. The highest total germination occurred at 15˚C temperature. Marija Saric-Krsmanovic, Jelena Gajic Umiljendic et.al ;(2015).

The influence of temperature and relative humidity directly affect on the seed quality, controlled temp. And relative humidity minimizes the harmful effects (injuries) made by naturally or manually.

The objective of the study was to determine seed quality response of Hy.Bajra (AT-4938) three lots stored under a wide range of temperature and relative humidity conditions for specific periods. Quality parameters used in this study include seed germination percentage, electrical conductivity, seedling weight, Oven dry weight, seedling length, seed vigour index (mass), vigour index (length).

MATERIALS AND METHODS

MATERIALS

Hy.Bajra (AT-4938) variety which is growing in production center viz; Baleshwarpuram (Andhra Pradesh State) during *kharif* were used for the study. The same climatic and environmental conditions; the stored seed conditions affect on the seed quality parameters such as Germination, seed vigour index (Mass, Length), during regular interval of time. Three lots of said variety taken for the testing from production center; the lots were stored in ambient (29°c&75%RH) and control (16°C&30%RH) condition. They were evaluated according to ISTA and

Indian Minimum Seed Certification Standards Rules; tested from initial to nine months in both the conditions. The following parameters were tested according to ISTA standards.

1. Germination (%),
2. Electrical conductivity ($\mu scm^{-1}g^{-1}$),
3. Seedling Mass Weight (gm),
4. Seedling Length (cm),
5. Oven dry weight (gm),
6. Seedling Vigour Index (%) Length,
7. Seedling Vigour Index (%) Mass.

1. Germination

Germination is a process in which the emergence of plumule and radical in presence of favourable conditions such as light, temp., water, humidity. The conditions maintained in artificially walking chamber with temp. (±25-30°c) and Relative humidity with (±65-70%)

Equipments

1. Electric Oven with capacity 250°c.
2. Germination walking Chamber with aseptic condition.
3. Evaluation Board/Counting board.
4. Petri plates, Pencil, Eraser, Thread, Scale, Record Book.
5. Hy.Bajra Samples
6. Analytical Balance
7. Germination Media (Paper)

METHODS

1. All the samples are prepared in four replications 10 seeds in each replication for testing with their labels.
2. Spread a paper towel on a flat surface and moisten with water until it is thoroughly damp.
3. Place a total of 40 seeds in four Replications i.e.10 seeds in each replication in rows on the towel.
4. Moisten a second towel and carefully place onto the first paper towel.

5. Roll up the two towels with the seeds in-between and place in a sealed container that will retain the moisture. Place the container in an area of relatively stable temperature (25-30ºC) &RH (65-70%) unless otherwise instructed. Avoid areas where direct sunlight with its heating effect strikes the container.

6. Mark the container with the date and variety Lots of seed.

7. after the required germination period for First count (4^{th} day) and Second or Final count (7^{th} day), remove the towels from the container.

8. Count the seedlings that have shoots longer than 1½ inches (and at least one strong root) as viable seeds in the germination rate. Seedlings exhibiting short shoots and/or roots less than 1½ inches would probably not germinate soon enough in our cool soils to contribute significantly to the yield.

9. Determine the actual percent of germination. In this case it is the number of seeds exhibiting strong germination.

10. The seedlings categorized into Normal seedling, abnormal seedlings, Fresh ungerminated seeds, hard seeds, Dead seeds.

Formula-Total Number of Germinated Seeds /Total Number of Seeds Tested×100.

The testing procedures Made for the Initial or First count Evaluation (4^{TH} Day) of Seedling (ISTA and IMSCS).

1. Germination%

Normal Seedlings- The seedlings shows well developed plumule and radicle and further developed into normal plant.

Abnormal Seedlings- The discontinued growth of plumule and radicle or the absence of any one of the essential structure.

Fresh Ungerminated Seeds- The seed absorbs the moisture after end of test period but not shows any structure and remains as it is.

Hard Seeds- At the end of test period seed doesn't absorbs moisture and remains as it is., when pressing it looks hard.

Dead Seeds- The decaying matter emerges out from the seed when pressing the seed after test period is dead seeds.

2. Seedling Fresh Mass weight (gm)

The fresh weight of Root and Shoot taken separately in gms and kept in Petridishes. The fresh weight taken in analytical weighing machine the lot showing maximum weight is considered as more vigorous.

3. Seedling Length (cm)

Each and every seedling (Root and Shoot) were measured separately in cms. The lot showing maximum seedling length is considered as vigorous.
They were kept for Oven drying for 2 hours at ±130ºc temperature.

4. Seed Vigour Index % (Length)

The total length of Root and Shoot measured and then mean of total length taken for calculating the seed vigour index length. The vigour index length calculated by following formula; a combination of standard germination test with seedling length provides board evaluation of seedling vigour. Seed lot with high vigour index is considered as vigorous (Abdul Baki Anderson, 1973).

Vigour Length Index (Length) %= Germination× Total seedling length on the day of final count.

5. Seed Vigour Index % (Mass)

After oven drying for 18 hours at 103ºc temperature the dry matter kept for cooling and weight taken after cooling. Seed vigour index mass calculated by following formula.

Vigour Mass Index %= Germination Dry weight of seedling after the final count.

6. Electrical conductivity ($\mu scm^{-1}g^{-1}$)

Principle - The solute leaked out from seed into the water is not available to the seed resulting in poor field emergence (Mathews and Whitbread, 1968).Degradation changes in the cellular membrane causing increased permeability and leakiness. A deteriorated seed lot leaches more water soluble compounds than a vigorous one when soaked in water. The electrical conductance of a solution will be higher with the high concentration of ions in the solution.

Equipments - Analytical balance, beaker, deionized water, incubator and standard electrical conductivity meter.

Procedure - replicates of 50 seeds from each lot are weighed to 2 decimal place in a beaker. 250 ml deionized water is added in each beaker. These beakers are kept at 20°C for 24 hours after proper covering to reduce the evaporation and contamination. A beaker containing deionized water with no seed is set with each test as control. After 24 hours the soak water is poured through a coarse sieve into another beaker to remove the seed. The electrical conductivity of the water is measured by electrical conductivity meter at constant temperature with shaking of beaker. The conductivity of water in control is subtracted from the reading of soak water before calculating the conductivity per gram of seed and expressed as micro siemens/ g of seed (µs/cm/g).

Interpretation –

24 or less	Normal seed
25-29	Suitable for early sowing, risk of poor performance under Adverse conditions
30-43	Not suitable under adverse condition.
44 and more	Not suitable for sowing.

Ion content of water used for soaking, temperature during soaking of seed, length of the soaking period, temperature at the time of evaluation, seed moisture content and seed size affect the conductivity

****The procedures Made for the Final or Second count Evaluation (7^{TH} Day) of Seedling (ISTA and IMSCS).***

Same above testing procedures were applied for final count excepting the electrical conductivity, viz. germination, seedling length (cm), seedling mass weight(gm), Oven dry weight(gm) after two hour at ±130°c temp., vigour index (Mass, Length).

RESULTS AND DISCUSSION

EVALUATION OF INITIAL OR FIRST COUNT

Table-1. Germination, Hy.Bajra-AT-4938

Table-1. Germination % Comparative Testing of Hy.Bajra AT-4938. (I COUNT).

Sr.No.	Storage Period	Germination %		
		Lot. No.		
		8301	8302	8303
1	Initial A	88.00	81.00	82.00
2	3 Month A	86.00	80.00	85.00
3	6 Month A	87.00	79.00	91.00
4	9 Month A	95.00	72.00	90.00
1	Initial C	88.00	81.00	82.00
2	3 Month C	90.00	75.00	80.00
3	6 Month C	92.00	70.00	82.00
4	9 Month C	92.00	77.00	95.00
±SD		**3.06**	**4.19**	**5.44**
±SE		**1.08**	**1.48**	**1.92**

Table-2. Vigour Index (Mass) %, Hy.Bajra-AT-4938

Table-2. Vigour index (Mass) % Comparative Testing of Hy.Bajra AT-4938. (I COUNT).

Sr.No.	Storage Period	Mass. Index %		
		Lot. No.		
		8301	8302	8303
1	Initial A	2.4200	1.5800	2.1700
2	3 Month A	2.5000	2.5000	2.6800
3	6 Month A	2.7000	2.5710	2.6295
4	9 Month A	2.6505	2.1636	2.5965
1	Initial C	2.4200	1.5800	2.1700
2	3 Month C	4.5000	2.8000	2.5000
3	6 Month C	4.2600	2.6565	2.4390
4	9 Month C	3.0176	2.0328	2.4090
±SD		**0.8405**	**0.4757**	**0.1956**
±SE		**0.2972**	**0.1682**	**0.0691**

Table-3. Oven Dry weight (gm), Hy.Bajra-AT-4938

Table-3. Dry weight (gm) Comparative Testing of Hy.Bajra AT-4938. (I COUNT).

Sr.No.	Storage Period	Dry Wt. Gm		
		Lot. No.		
		8301	8302	8303
1	Initial A	0.0300	0.0200	0.0300
2	3 Month A	0.0380	0.0386	0.0320
3	6 Month A	0.0311	0.0326	0.0289

4	9 Month A	0.0279	0.0301	0.0289
1	Initial C	0.0300	0.0200	0.0300
2	3 Month C	0.0490	0.0420	0.0350
3	6 Month C	0.0464	0.0380	0.0298
4	9 Month C	0.0328	0.0264	0.0262
±SD		**0.0080**	**0.0084**	**0.0026**
±SE		**0.0028**	**0.0030**	**0.0009**

Table-4. Electrical conductivity (µscm^{-1}g^{-1}), Hy.Bajra-AT-4938

Table-4. Electrical Conductivity (µscm^{-1}g^{-1}) Comparative Testing of Hy.Bajra AT-4938.(I COUNT).

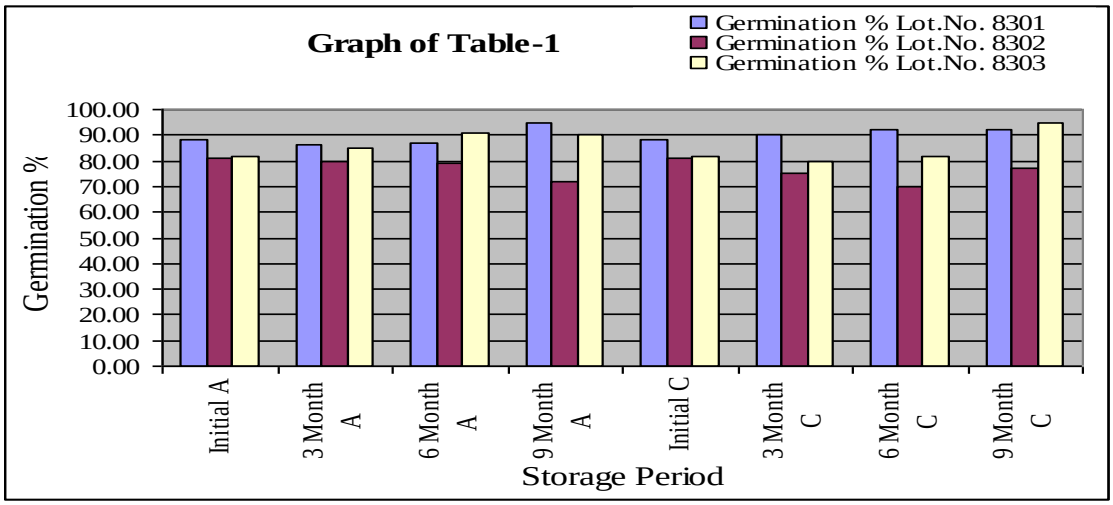
Sr.No.	Storage Period	Electrical Conductivity (µscm^{-1}g^{-1})		
		Lot. No.		
		8301	8302	8303
1	Initial A	74.41	92.40	93.47
2	3 Month A	80.50	60.25	68.00
3	6 Month A	102.62	69.42	70.16
4	9 Month A	107.58	78.58	71.60
1	Initial C	74.41	92.40	93.47
2	3 Month C	60.12	40.50	55.58
3	6 Month C	62.60	44.21	63.60
4	9 Month C	68.53	53.99	64.20
±SD		**17.54**	**20.23**	**13.84**
±SE		**6.20**	**7.15**	**4.89**

Table-5. Vigour Index (Length) %, Hy.Bajra-AT-4938

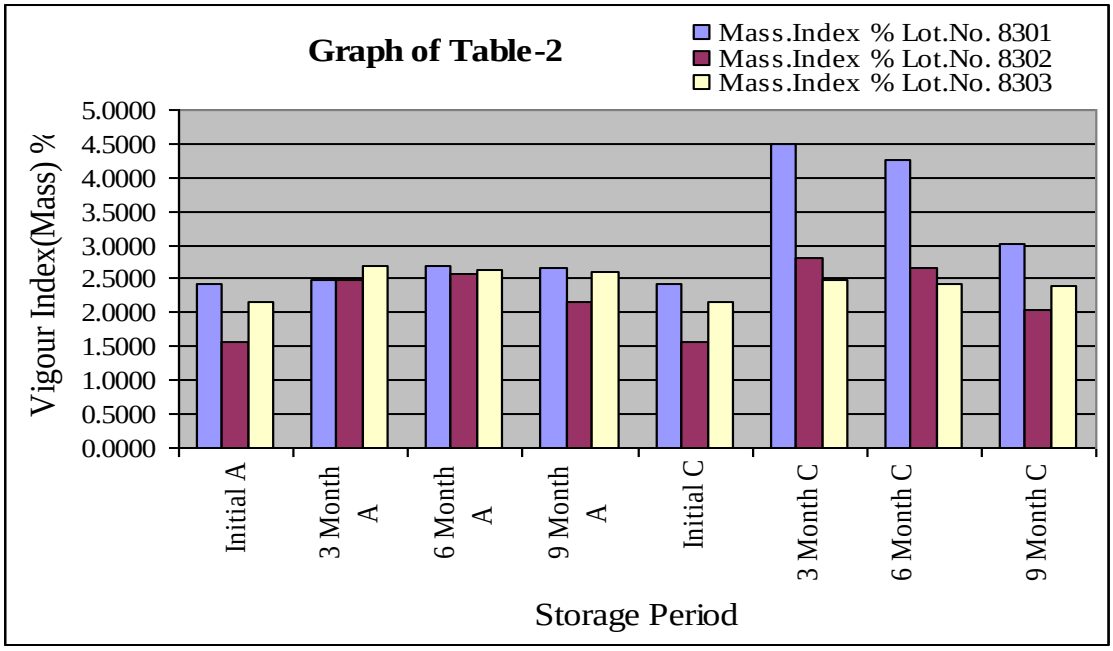
Table-5. Vigor index (Length) % Comparative Testing of Hy.Bajra AT-4938. (I COUNT).

Sr.No.	Storage Period	Vigour Index Length %		
		Lot. No.		
		8301	8302	8303
1	Initial A	1376.7600	1110.1100	1280.8400
2	3 Month A	1350.0000	1260.5500	1450.0000
3	6 Month A	1282.3800	1115.8750	1318.5900
4	9 Month A	1241.6500	966.6000	1196.5500
1	Initial C	1376.7600	1110.1100	1280.8400
2	3 Month C	2072.1500	1416.2000	1480.5000
3	6 Month C	1896.5800	1244.6000	1328.4000
4	9 Month C	1457.2800	1022.9450	1288.2000
±SD		**305.4451**	**144.3618**	**93.7628**
±SE		**108.0075**	**51.0473**	**33.1552**

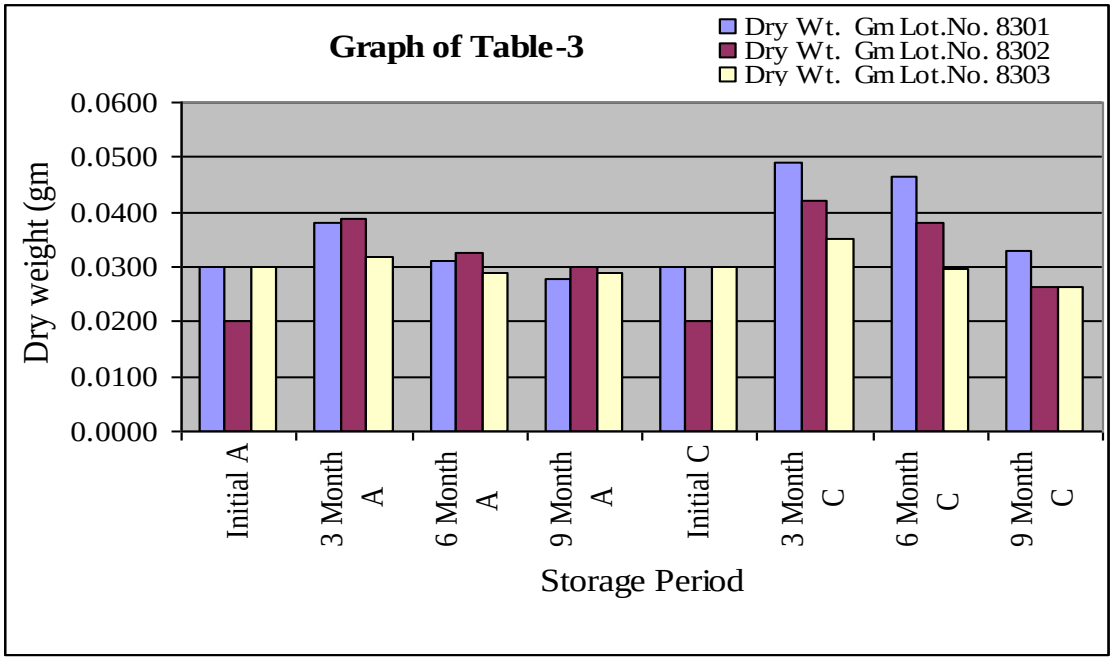
Graph-1. Germination, Hy.Bajra-AT-4938



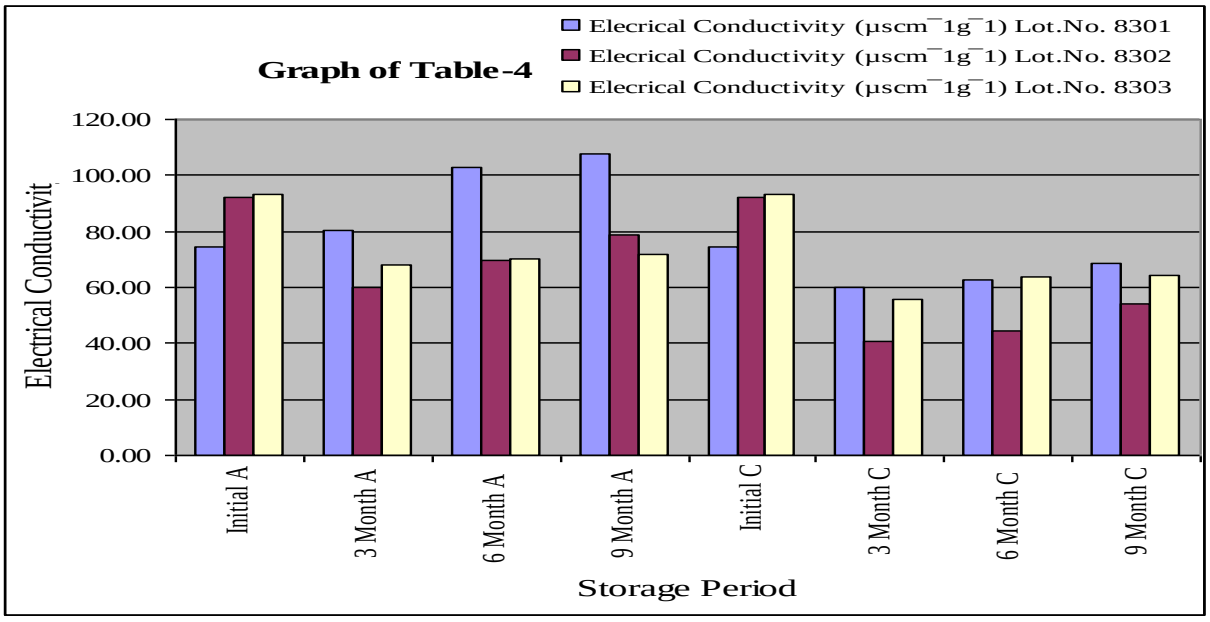
Graph-2. Vigour Index (Mass) %, Hy.Bajra-AT-4938



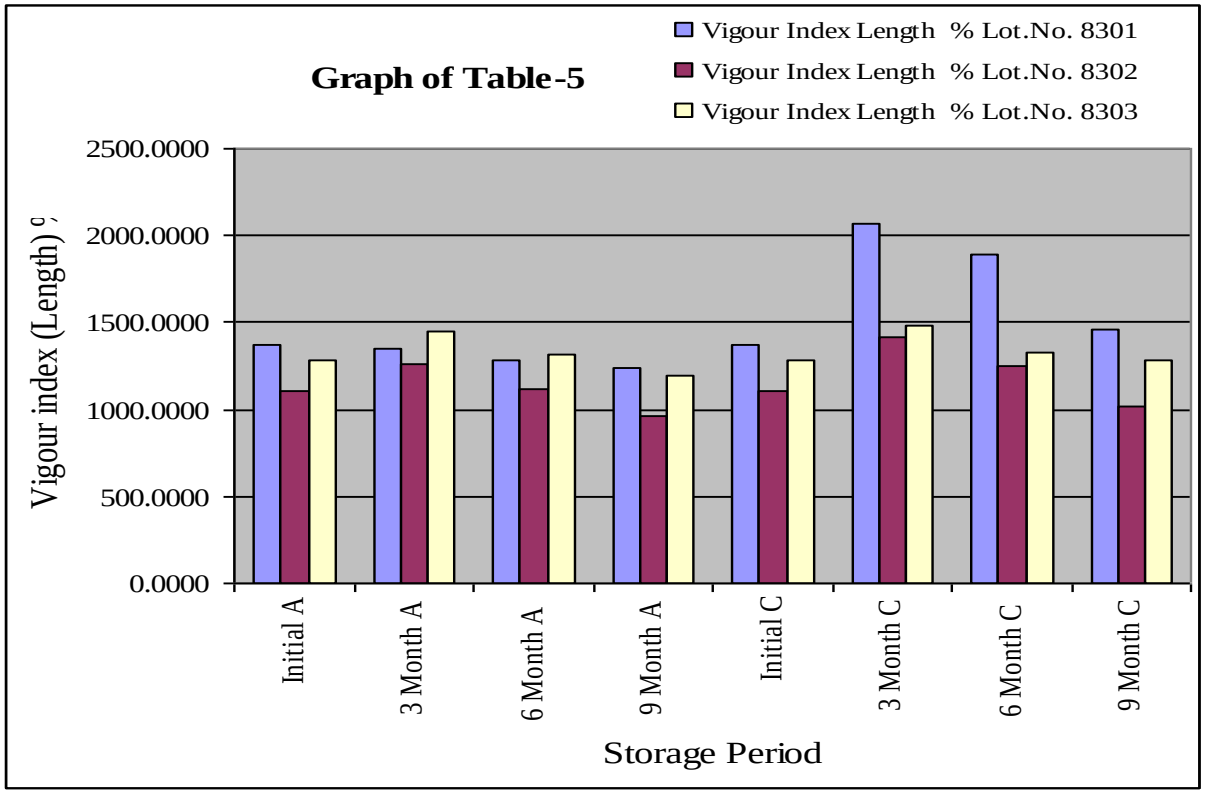
Graph-3. Oven Dry weight (gm), Hy.Bajra-AT-4938



Graph-4. Electrical conductivity (μscm^{-1}g^{-1}), Hy.Bajra-AT-4938



Graph-5. Vigour Index (Length) %, Hy.Bajra-AT-4938



EVALUATION OF FINAL OR SECOND COUNT

Table-1. Germination, Hy.Bajra-AT-4938

Table-1. Germination % Comparative Testing of Hy.Bajra AT-4938. (II COUNT).

Sr.No.	Storage Period	Germination %		
		Lot. No.		
		8301	8302	8303
1	Initial A	87.00	83.00	91.00
2	3 Month A	85.00	85.00	88.00
3	6 Month A	82.00	80.00	90.00
4	9 Month A	94.00	85.00	85.00
1	Initial C	87.00	83.00	91.00
2	3 Month C	86.00	87.00	88.00
3	6 Month C	89.00	80.00	85.00
4	9 Month C	85.00	70.00	90.00
±SD		**3.52**	**5.29**	**2.45**
±SE		**1.25**	**1.87**	**0.87**

Table-2. Vigour Index (Mass) %, Hy.Bajra-AT-4938

Table-2. Vigour index (Mass) % Comparative Testing of Hy.Bajra AT-4938. (II COUNT).

Sr.No.	Storage Period	Mass. Index %		
		Lot. No.		
		8301	8302	8303
1	Initial A	4.3500	2.9100	3.1900
2	3 Month A	4.4000	3.9455	3.6544
3	6 Month A	4.3165	3.8000	3.4740
4	9 Month A	3.1355	3.6313	3.1613

1	Initial C	4.3500	2.9100	3.1900
2	3 Month C	4.5650	3.2012	3.7071
3	6 Month C	3.9405	3.1600	3.6050
4	9 Month C	3.3988	2.7510	3.4155
±SD		**0.5225**	**0.4489**	**0.2227**
±SE		**0.1847**	**0.1587**	**0.0787**

Table-3. Oven Dry weight (gm), Hy.Bajra-AT-4938

Table-3. Dry weight (gm) Comparative Testing of Hy.Bajra AT-4938. (II COUNT).

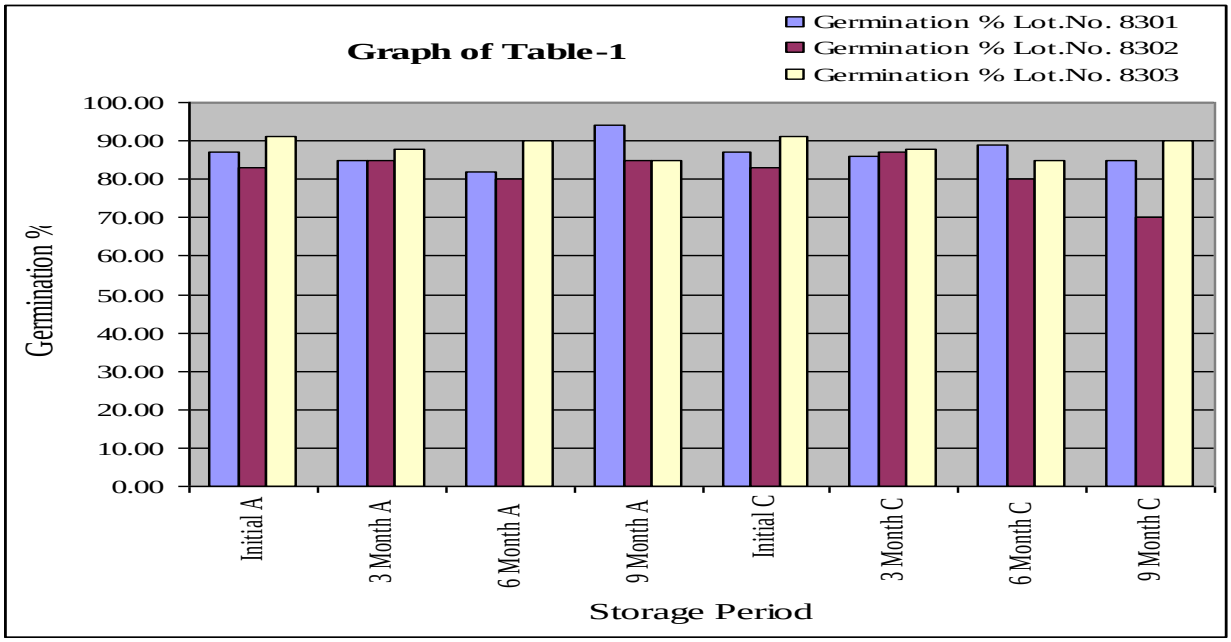
Sr.No.	Storage Period	Dry.Wt. Gm		
		Lot. No.		
		8301	8302	8303
1	Initial A	0.0500	0.0400	0.0400
2	3 Month A	0.0535	0.0482	0.0386
3	6 Month A	0.0527	0.0475	0.0380
4	9 Month A	0.0483	0.0463	0.0343
1	Initial C	0.0500	0.0400	0.0400
2	3 Month C	0.0462	0.0412	0.0452
3	6 Month C	0.0443	0.0396	0.0425
4	9 Month C	0.0418	0.0393	0.0380
±SD		**0.0041**	**0.0039**	**0.0033**
±SE		**0.0014**	**0.0014**	**0.0012**

Table-4. Vigour Index (Length) %, Hy.Bajra-AT-4938

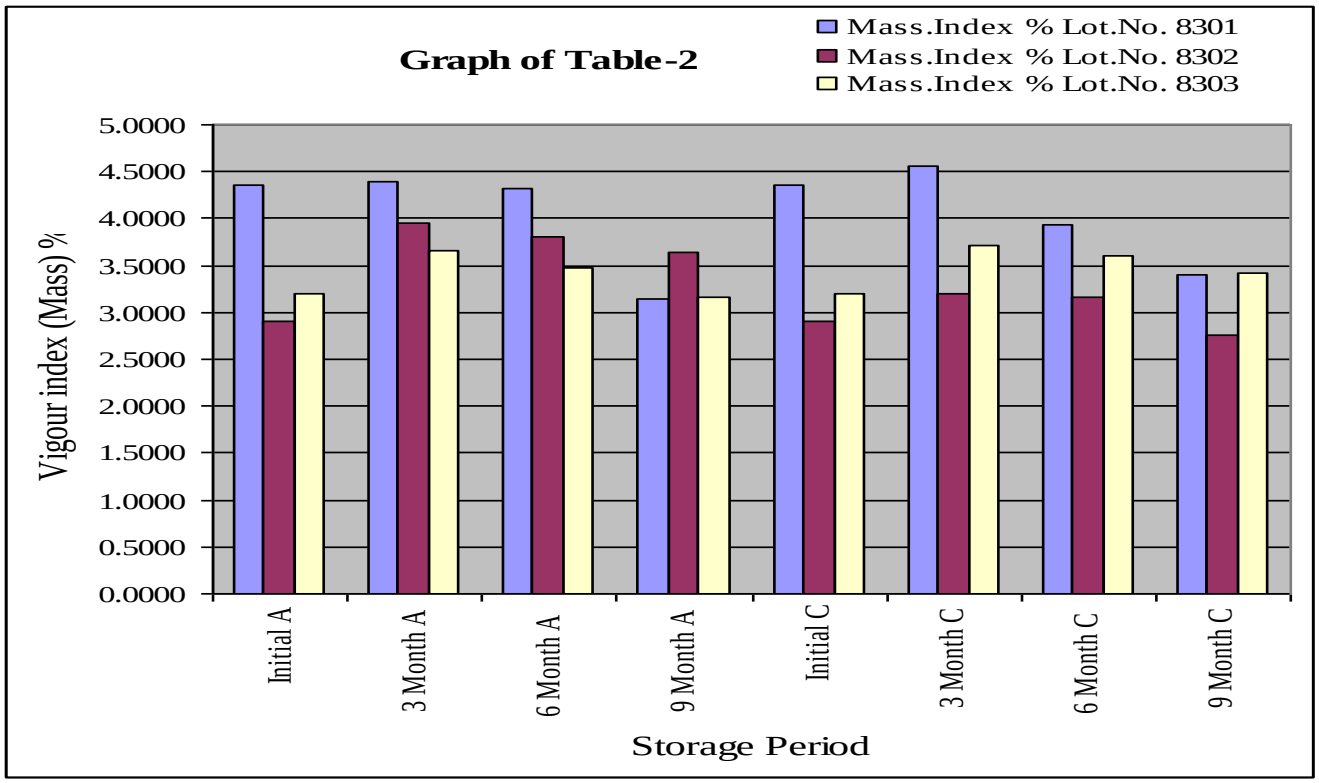
Table-4. Vigor index (Length) % Comparative Testing of Hy.Bajra AT-4938. (II COUNT).

Sr.No.	Storage Period	Vigour Index Length %		
		Lot. No.		
		8301	8302	8303
1	Initial A	1951.8450	1572.4350	2845.1150
2	3 Month A	1943.5542	1772.1714	2117.1912
3	6 Month A	1881.0800	1734.8000	1809.0000
4	9 Month A	1714.7500	1647.9000	1710.3750
1	Initial C	1951.8450	1572.4350	2845.1150
2	3 Month C	2062.1653	1754.1252	2365.3225
3	6 Month C	1859.5850	1668.4000	2210.0000
4	9 Month C	1848.4500	1211.3500	1910.7000
±SD		**101.7803**	**180.8229**	**437.0816**
±SE		**35.9902**	**63.9402**	**154.5550**

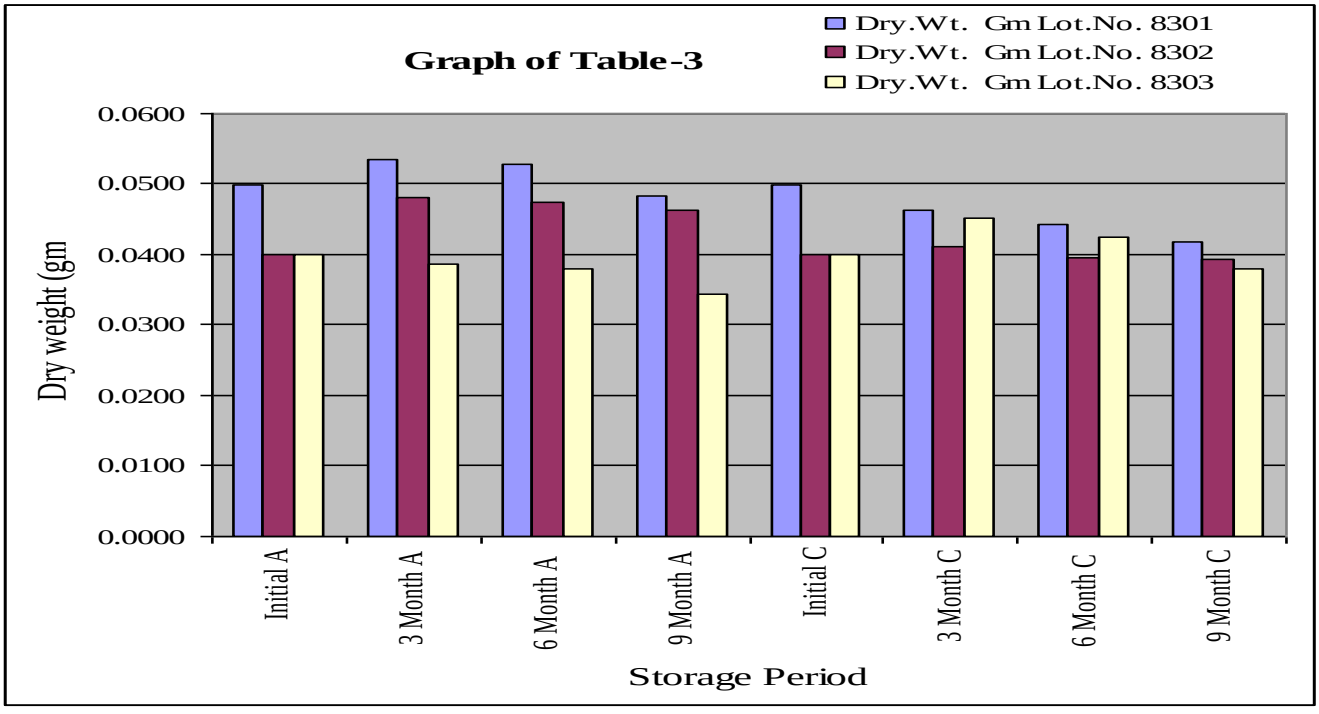
Graph-1. Germination, Hy.Bajra-AT-4938



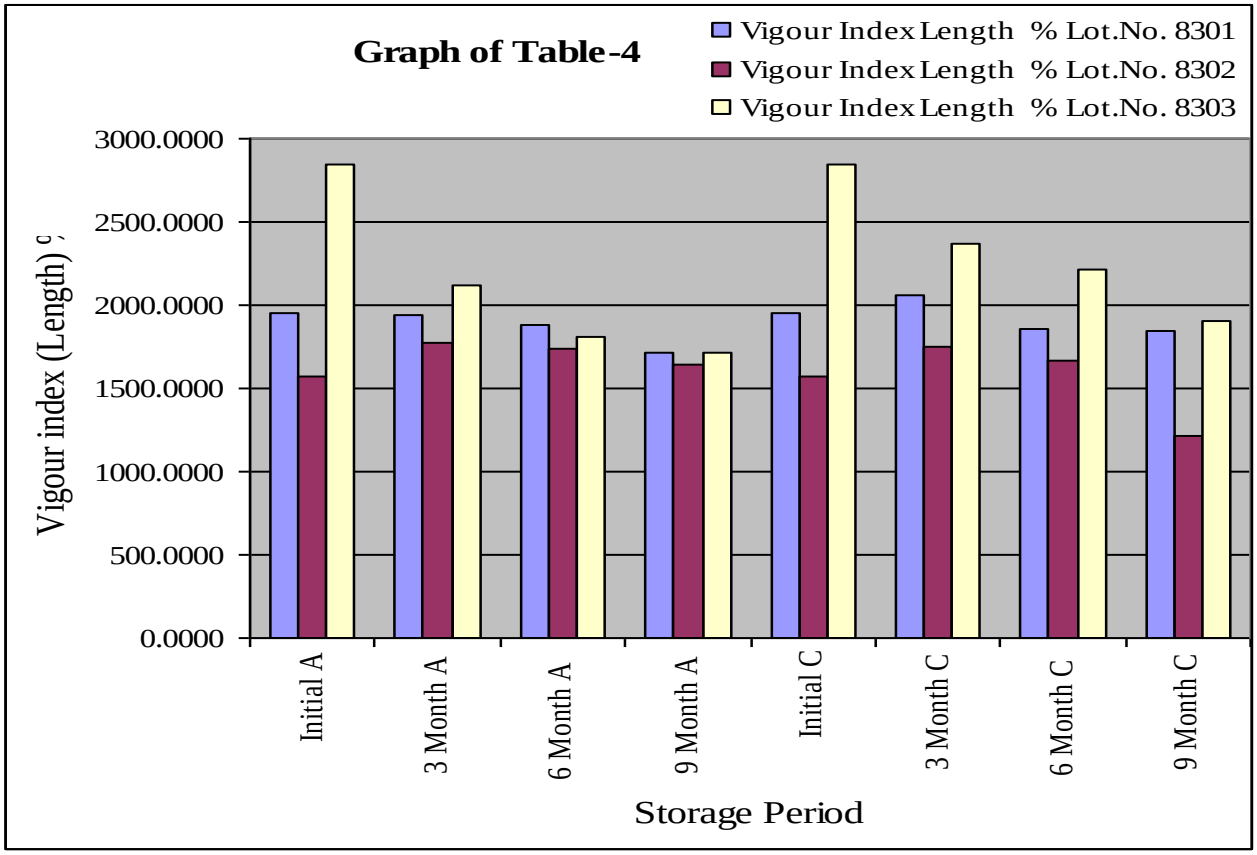
Graph-2. Vigour Index (Mass) %, Hy.Bajra-AT-4938



Graph-3. Oven Dry weight (gm), Hy.Bajra-AT-4938



Graph-4. Vigour Index (Length) %, Hy.Bajra-AT-4938



DISCUSSION

Following the parameters the results showed the significant correlation in storage conditions i.e. ambient and control condition. Several techniques which are used for seed preservation to maintain or to stabilize the viability of seed (to maintain seed quality) by researchers. The 3 samples of Hy.Bajra tested for this point of view to test the seed quality after initial, 3, 6,9 months intervals during storage conditions in ambient(29°c&75%RH) and control(16°C&30%RH) condition.

The seed quality slows down after specific time duration period or it is deteriorates in some periods.

The testing of these for seed germination percentage, seedling mass wt. (gm), electrical conductivity ($\mu scm^{-1}g^{-1}$), vigor index length (%), vigor index mass (%).

First count Evaluation, The 3 samples 8301, 8302, 8303

Showed germination 88,81,82,86,80,85,87,79,91,95,72,90; respectively, after initial,3,6,9 month in ambient condition. The control condition showed germination, 88,81,82,90,75,80,92,70,82,92,77,95; in 3,6,9month respectively. The germination percentage of samples were fluctuates which showed lowest and highest figures; in both the conditions. In relationship with mass index, it gradually decreased after testing periods of initial, 3, 6, 9months, in ambient and control condition. Mass indexes as Belows, 2.42, 1.58, 2.17, 2.50, 2.50, 2.68, 2.70, 2.5710, 2.6295,2.6505,2.1636,2.5965; In ambient condition from initial to 9month samples respectively. In control condition 4.50,2.80,2.50,4.26,2.6565,2.4390,3.0176,2.0328,2.4090;respectively in 3,6,9 month.

Electrical conductivity increases with increasing days of interval, showed as 74.41, 92.40, 93.47, 80.50, 60.25, 68.00, 102.62,69.42,70.16,107.58,78.58,71.60 in ambient condition initial,3,6,9 month respectively; while in control condition it is 60.12,40.50,55.58,62.60,44.21,63.60,68.53,53.99,64.20 in 3,6,9 month respectively.

The dry weight (gm) as follows, in initial, 3, 6, 9 month ambient condition 0.0300, 0.0200, 0.0300, 0.0380, 0.0386, 0.0320,0.0311,0.0326,0.0289,0.0279,0.0301,0.0289 in control 0.0490, 0.0420, 0.0350, 0.0464, 0.0380, 0.0298,0.0328,0.0264,0.0262 in 3,6,9 month respectively;

The Vigor index length also declined during storage periods. In ambient it is 1376.7600, 1110.1100, 1280.8400, 1350.0000, 1260.5500, 1450.0000, 1282.3800, 1115.8750, 1318.5900, 1241.6500, 966.6000, 1196.5500; respectively in initial, 3, 6, 9 month. In control storage; 2072.1500, 1416.20, 1480.5000, 1896.5800, 1244.6000, 1328.4000, 1457.2800, 1022.9450, 1288.2000; respectively in 3, 6, 9 month.

Final count Evaluation, The 3 samples 8301, 8302, 8303

Showed germination 87,83,91,85,85,88,82,80,90,94,85,85; respectively,after initial, 3, 6, 9 month in ambient condition. The control condition showed germination, 86,87,88,89,80,85,85,70,90; in 3,6,9month respectively. The germination percentages of samples were variates from initial count in both the conditions. In mass index, it increased after second count testing periods of initial, 3, 6, 9months, in ambient and control condition. Mass indexes as Belows, 4.3500, 2.9100, 3.1900,4.4000,3.9455,3.6544,4.3165,3.8000,3.4740,3.1355,3.6313,3.1613; In ambient condition from initial to 9month samples respectively. In control condition 4.5650, 3.2012, 3.7071, 3.9405, 3.1600, 3.6050, 3.3988, 2.7510, 3.4155; respectively in 3, 6, 9 month.

The dry weight (gm) as follows, in initial, 3, 6, 9 month ambient condition 0.0500, 0.0400, 0.0400, 0.0535, 0.0482, 0.0386,0.0527,0.0475,0.0380,0.0483,0.0463,0.0343; in control 0.0462, 0.0412, 0.0452, 0.0443, 0.0396, 0.0425, 0.0418,0.0393,0.0380 in 3,6,9 month respectively; The Vigor index length also increased in final count as compare to initial count as below; In ambient it is 1951.8450, 1572.4350, 2845.1150, 1943.5542, 1772.1714, 2117.1912, 1881.0800, 1734.8000, 1809.0000, 1714.7500, 1647.9000, 1710.3750,; respectively in initial, 3, 6,9month. In control storage; 2062.1653, 1754.1252, 2365.3225, 1859.5850, 1668.4000, 2210.0000, 1848.4500, 1211.3500, 1910.7000; respectively in 3, 6, 9 month.

CONCLUSION

The study concluded that the optimum control storage condition with suitable temperature and relative humidity had best and effective for vigour parameters. The stored seed with control condition were best performed than ambient condition and also the vigour parameters were decreased with increase in storage period; the vigour changes from initial to final count.

REFERENCES

1. Abdullah M. Alhamdan, Abdullah A. Alsadon et.al; (2011): Influence of Storage Conditions on Seed Quality and Longevity of Four Vegetable Crops. American-Eurasian J. Agric. & Environ. Sci., 11 (3): 353-359, 2011ISSN 1818-6769© IDOSI Publications, 2011.
2. Baskin, C.C. & Baskin, J.M. (1998): Seeds: Ecology, biogeography and evaluation of dormancy and germination. San Diego, CA: Academic Press.
3. Balesevic-Tubic, S., Tatic et al ;(2010): SEED VIABILITY OF OIL CROPS DEPENDING ON STORAGE CONDITIONS HELIA, 33, Nr. 52, p.p. 153-160, (2010).
4. Board on Science and Technology for International Development; Office of International Affairs; National Research Council (1996-02-14): "Pearl Millet: Subsistence Types". Lost Crops of Africa: Volume I: Grains. Lost Crops of Africa.1. National Academies Press. p. 108. ISBN 978-0-309-04990-0, Retrieved2007-11-07.
5. Balesevic-Tubic, S., Tatić, M., Hrustić, M., Miladinović, J., Maksimović, L., (2007) b:The influence of aging process on germination and seedling growth of sunflower seed Proceedings of The First Joint PSU-UNS International Conference on BioScience: Food, Agriculture, and the Environment, Thailand: 198-202.

6. Christensen, C.M., (1971): Evaluating conditions and storability of sunflower seeds. J. Stored Prod. Res. 7: 163-169.
7. Forcella, F. (1998): Real-time assessment of seed dormancy and seedling growth for weed management. Seed Science Research, 8(2), 201-209. Doi: 10.1017/S0960258500004116.
8. Forcella, F., Benech-Arnold, R.L., Sanchez, R. & Ghersa, C.M. (2000): Modeling seedling emergence. Field Crops Research, 67, 123-139.
9. ISTA (1999): International Rules for Seed Testing. International Seed Testing Association, Switzerland.
10. Millet. Consultative Group on International Agricultural Research.
11. Marija Saric-Krsmanovic, Jelena Gajic Umiljendic et.al ;(2015): Impact of storage conditions on seed germination and seedling growth of wild oat (Avena fatua L.) at different temperatures Pestic. Phytomed (Belgrade), 30(4), 2015, 243–248. DOI: 10.2298/PIF1504243S..
12. Seed Technology (2000): Dhirendra Khare & Mohan Bhale, Scientific Publishers, Jodhpur.
13. Seed Technology: Ratanlal Agrawal, Oxford & IBH Publishing CO. PVT. LTD. New Delhi.
14. Soybean Seed and Seedling Diseases Crop Focus, Dupont pioneer agronomy science.
15. "Sorghum and millet in human nutrition", Food and Agriculture Organization of the United Nations. 1995.

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