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Seed Storage in Brinjal (*Solanum melongena* L.)

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Seeds of brinjal cultivar Pusa Purple Long retained by a sieve with 12 x 12 perforations per sq. inch were dried to eight per cent moisture content and packed with and without silica gel in paper bag and paper-aluminium foil-polyethylene laminated pouch (P-AF-P pouch) and stored under ambient temperature and relative humidity for a period of 39 months. Seeds stored in aluminium foil pouch with silica gel recorded 50 per cent germination even at the end of the 39th month, while in the other treatments seeds deteriorated rapidly after twelve months. Aluminium foil with silica gel is recommended for safe storage of brinjal seeds for long periods.

Seed is the nucleus of life and is subject to continuous ageing once it has reached maturity. This phenomenon results in an irreversible change in seed quality, ultimately affecting viability. Seed may be produced under a rigorous system of inspection, harvested properly and processed to the highest purity, but the investment of time, effort and money is lost if the seeds are not provided with a proper storage environment. In brinjal not much work on storage had been done in India and the exact information which provide proper environment to prolong the storage life of seed is wanting. Hence, these studies were undertaken to find out a suitable and cheap method of storage under ambient conditions that can be advocated to the seed farmers.

MATERIALS AND METHODS

Seeds extracted from freshly harvested well matured yellow tinged fruits of variety Pusa Purple Long were uniformly dried to an initial moisture content of 8.0 per cent and graded with a wire mesh sieve with 12 x 12 perforations per square inch.

The graded seeds were put in predetermined sample quantities in brown paper bag (C_1) (15 x 13 cm) and in 55/60 g paper 0.09 mm aluminium foil/150 g polyethylene laminated (P-AF-P) pouches (C_2) (15 x 13 cm) without (S_0) or with (S_1) silica gel. Silica gel was added at the rate of 200 g/1000 g of seeds and kept inside the container in a muslin cloth. The paper bags were sealed with gum while the aluminium bags were heat sealed. They were stored on December, 1973 under ambient conditions of temperature and relative humidity for a period of 39 months. The seed viability of the stored seed was tested by standard germination test in the laboratory and the vigour by its field emergence potential (ISTA, 1966). The tests were con-

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ducted at the end of 3rd (M_2), 6th (M_3), 9th (M_4), 12th (M_5), 18th (M_6), 24th (M_7), 36th (M_8) and 39th (M_9) months of storage. For germination test, 4 x 100 seeds in each treatment were placed at equidistance on top of paper in petridishes and germinated at 25°C ± 2°C temperature and 95 per cent relative humidity in the germination room. The germinated seedlings were evaluated after ten days and the mean germination percentage was calculated.

To assess the seed vigour by the field emergence potential 400 seeds from each treatment were sown in raised beds of size 3 m x 1 m at the rate of 100 seeds per replication. On the 10th day, the field emergence was recorded.

RESULTS AND DISCUSSION

The differences in germination due to treatment and period of storage were highly significant. The germination percentage got reduced to zero in a storage period of 39 months in paper bags while in aluminium foil pouch, it remained at 50 per cent even at the end of 39th month. Seeds stored in aluminium foil pouch recorded higher germination than in paper bag. Seeds stored with silica gel always recorded higher viability than that without (Table I and II).

Upto one year, seeds in aluminium foil pouch containing silica gel maintained a germination of about 70 per cent which is the minimum stipulated by the Central Seed Committee (Anonymous, 1971) for certification of seeds.

TABLE. I Effect of containers, seed treatment and period of storage on seed germination and field emergence in Pusa Purple Long brinjal

Months	Container	Mean germination (%)				Mean field emergence (%)			
		Paper bag		P-AF-P-Pouch		Paper bag		P-AF-P-Pouch	
	Treatment	S_0	S	S_0	S	S_0	S	S_0	S
M_1		80	80	76	82	59	57	69	64
M_2		74	74	74	79	52	50	50	51
M_3		70	68	72	76	54	55	56	59
M_4		52	58	57	68	53	51	49	59
M_5		59	61	54	70	37	29	28	46
M_6		36	42	35	48	31	30	32	48
M_7		39	40	40	50	27	26	22	36
M_8		4	11	3	51	4	8	2	34
M_9		0	4	0	50	0	3	0	34

TABLE. II Analysis of variance for the parameters studied

Source of variation	Germination	Field emergence
Treatment	444.23**	250.75*
Container	164.52NS	158.65NS
Months	1011.47**	735.29**
Treatment × Cantainer	270.01*	232.30*
Treatment × Month	86.68NS	32.20NS
Container × Month	38.12NS	17.25NS
Error	31.33	43.38
CD between treatments	3.618	4.47
CD between container	?	4.47
CD between months	7.672	9.48
CD treatment × container	5.115	6.32

* Significant at 5% level
** Significant at 1% level
NS Not Significant

Irrespective of containers the field emergence of seeds exhibited significant differences. The field emergence seeds stored with silica gel was significantly superior. The field emergence potential was maintained upto one year and later there was a significant reduction in field emergence. Aluminium foil pouch with silica gel recorded higher percentage of field emergence while paper bag failed to prove the beneficial effect of silica gel on germination of seeds under field condition.

The determining factor in the relationship of seed moisture and seed deterioration is the water vapour pressure that exists in the seed and the surrounding air (Haynes 1969; Henderson and Perry, 1955). The moisture vapour proof nature of the aluminium foil pouch helps to maintain the initial seed moisture content whereas in paper bags, the seed moisture content fluctuated depending upon the prevailing atmospheric relative humidity and temperature. The effects of desiccant silica gel especially in aluminium foil was evident from a lesser moisture content recorded in these seed samples.

The effect of silica gel as a desiccant was manifest only in the moisture vapour proof container, the aluminium foil pouch, and not in the paper bag. San Pedro (1936) stated that egg plant, tomato, bean and lettuce when stored in the absence of a drying agent kept well only for 162 days while those stored over $CaCl_2$ showed deterioration after 312 days. Coleman and Peel (1952) also opined that storage with silica gel improved germination. Hence for storing seeds of brinjal under ambient room temperature and relative humidity, it is recommended that seeds with an initial moisture content of eight per cent or less are to be stored in moisture vapour proof containers like aluminium foil pouch with silica gel at 200 g/kg of seeds.

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