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Viability of Some Grass Seeds

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Seeds form the first and foremost basis for successful farming. They must be of superior quality, free from mixtures of other crop plants, varieties, strains and weeds, free from mechanical impurities, diseases and pests. While satisfying the above needs of good quality seed, the next most important point is that every seed sown should sprout and grow into a plant i. e. it must be viable. If they are poor in germination there will be gaps formed in the field and the yields will consequently be low. So it is very essential to have viable seeds for sowing purposes. The germination capacity of seed are affected by the environmental conditions at the time of the seed setting and formation, stage of harvest, methods of storage and period of storage. The present paper gives a preliminary report of the viability of a few grass seeds under different periods of storage.

Initial germination capacity: Seeds of some of the cereals and most of the grasses in general do not give cent percent germination even in the first year of collection. Millets have the highest initial germination percentages ranging from 92–98 except cholam which has 85% of germination (4). Some grasses give 70 to 80% germination and many give even less. The seeds of fodder grasses tested in the laboratory gave the following figures (Vide Table I). The seeds were stored in thick brown paper bags. The testing was done by soaking the seeds for 2–3 hours in water, then arranged on blotting paper on germination trays and kept at room temperature, as described in a previous paper (2). A single spikelet as an unit is considered as 'seed' in this paper.

TABLE I

Germination percentages of the seeds of a few species of grasses:

Species	Germination percentages			
	I year of Storage	II year of Storage	III year of Storage	IV year of Storage
1. Panicum antidotale, Retz (Australian drought-resistant grass)	55—70	Continued to give 60—65% for 6 years.		
2. Enteropogon monostachyos, Schum.	75—80	58—78	65—67	35—38
3. Iseilema laxum, Hack. (Chengali gaddi)	36—48	18—20	8—10	Nil

	Species	Germination percentages			
		I year of Storage	II year of Storage	III year of Storage	IV year of Storage
4.	Cenchrus ciliaris, L. (Kolukattai grass)	35—39	32—46	5— 9	Nil
5.	C. setigerus, Vahl. (Black Kolukattai)	8—11	2— 8	2— 4	Nil
6.	Chloris bourneii, Rang. & Tad.	23—30	10—25	8—10	Nil
7.	Sehima nervosum, Stap. (Nendra gaddi)	17—26	16—24	6—14	1— 8
8.	Andropogon pumilus, Roxb.	22—32	24—32	20—22	3— 5
9.	Eremopogon foveolatus, Stapf.	8—10	3— 5	Nil	Nil
10.	Dichanthium annulatum, Stapf.	8—10	4— 6	3— 4	Nil
11.	Pennisetum polystachyon, Schult.	6— 8	14—22	Nil	Nil

From the above table it is clear that only a few grasses as *Panicum antidotale*, (The Australian drought-resistant grass) and *Enteropogon monostachyos* (a common forest grass) have high germination reaching 80%. The popular *Cenchrus ciliaris* (Kolukattai) and *Iseilema laxum* (Chengali gaddi) have 35 to 48% germination capacity and the others with less than 25%. The low initial germination percentages noted in most of the grasses is probably made up in nature, by the very large quantity in which they are produced. The poor germination of 8 to 11% noted in *Cenchrus setigerus* (Black Kolukattai) when compared to the 35-39% recorded for *C. ciliaris* may be taken to be the cause for the widespread nature of the second species over the other. Thin Napier *(Pennisetum ploystachyon)* with its low germination (6%) has spread admirably well in West Coast within a few years of its introduction there; this must be due to the prolific bearing which compensates for the low germination. Further, its viability in the second year is higher than in the first year.

Viability on storage: Generally with storage, there is decrease in germination capacity every year. Among the cereals of the temperate regions oats live longest, wheat and barley next and rye and maize have shorter life-spans (3). All the pasture grass seeds tested in England lost their viability between eighth to thirteenth year (1). Most of the tropical millets on the other hand lose their viability after 3 to 4 years after storge (4). The columns 3 to 6 in table 1 gives an idea about the viability of grass seeds in the successive years of storage. Many of the grasses retain their viability in their second year of storage and the deterioration is evident in the third year. Except in a few cases many of them in the fourth year of storage have lost their viability completely.

Special cases: *Panicum antidotale* (Australian drought-resistant grass.)

The trials with this species has shown that they are viable to 60 to 65% after 4 years of storage. The actual data collected are tabulated below.

TABLE II

Viability of Panicum antidotale seeds.

Seed testing done on	Seeds collected in the year	Year of storage	Percentage of germination
24—12—1945	1943	3rd year	61·0
13— 3—1946	1945	2nd year	50·0
3— 5—1949	1944	6th	34·0
7— 5—1949	8—4—1949	(1 month)	22·0
26— 5—1949	1948	2nd year	59·5
21— 6—1949	1948	,,	68·0
21— 6—1949	1944	6th year	87·0
5— 7—1949	1948	2nd year	72·0
5— 7—1949	1944	6th year	65·0
30—12—1949	Bulk coll. 1949	1st year	70·0
12— 1—1950	Dec. 1949	(1 month)	55·0

It is seen from the table that the germination percentages upto sixth year of storage has been quite high, from 65 to 87%. This conforms with the results obtained at Australia by Whittet in (1943) (5). Seeds collected and tested by him in July 1939 gave 67% germination. The same tested on September 1943 gave 74%.

This shows that the viability is not reduced after four years storage Whittet further says "*the viability of the seeds of many of the dry weather resistant grasses improve with five to six years of storage and Panicum antidotale may be included in this group.*" The tight-fitting glumes present in this species may aid in the retention of viability. A similar explanation is given by Croker (3) for the high viability of oats and it has been shown that deglumed oats, Proso millet (*Panicum miliaceum*, L) and timothy grains (*Phleum pratense*, L) lose their viability faster than those with the glumes intact.

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