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## ASSESSMENT OF QUALITY OF CHILLI SEED (*Capsicum annum* L.) PRODUCED IN DIFFERENT SEASONS BY ACCELERATED AGEING TEST

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### ABSTRACT

Seed produced in rabi season withstood the accelerated ageing test better than those from kharif. Deterioration was faster in small size (9"/64R) seeds than medium (8"/64R) or large (8"/64P) size seed when acceleratedly aged. Deterioration in seeds from earlier pickings was slower compared to those from later pickings in both the seasons.

### INTRODUCTION

Accelerated ageing test is a reliable test to predict the physiological stamina (Delouche and Baskin, 1973) of the seeds produced in different seasons under storage. Initial germination can only indicate the capacity of the seeds to germinate under a given environment but could not able to expose the structural physiological condition of the seed. To study the influence of environment or season production on the physiological stamina of the seeds some stress test is

essential among which accelerated ageing test has been employed to predict the quality.

### MATERIALS AND METHODS

Graded Seeds harvested from a bulk crop of chilli cv. K2 during Rabi 1978(S<sub>1</sub>), Kharif 1979 (S<sub>2</sub>) and Kharif 1980 (S<sub>3</sub>) in six pickings (Pi. I to Pi. VI) were used. Three grades of seeds viz., 9/64"R (G<sub>1</sub>), 8/64"R (G<sub>2</sub>) and 8/64"P (G<sub>3</sub>) were subjected to accelerated ageing test at 97 ± 1% RH and 40 ± 1°C temperature

Table - 1. Influence of season on germination (%) in size grades of seeds from six pickings after accelerated ageing for 9 days at 40° ±1°C temperature and 97± 1% RH in cv. K2 Chilli

	G <sub>1</sub>				G <sub>2</sub>				G <sub>3</sub>				Mean
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	
Pi.I	72.0 (58.0)	57.0 (49.0)	66.0 (54.3)	65.0 (53.7)	67.0 (54.9)	57.0 (49.0)	62.0 (51.9)	62.0 (51.9)	52.0 (46.1)	40.0 (39.2)	48.0 (43.8)	46.7 (43.1)	57.9 (49.4)
Pi.II	70.0 (57.7)	54.0 (47.2)	65.0 (53.7)	63.0 (52.5)	67.0 (54.9)	50.0 (45.0)	59.0 (50.1)	58.0 (50.0)	48.0 (43.8)	38.0 (38.0)	45.0 (42.1)	43.7 (41.3)	55.1 (47.9)
Pi.III	67.0 (54.9)	51.0 (45.5)	57.0 (49.0)	58.3 (49.7)	64.0 (53.1)	45.0 (42.1)	46.0 (42.7)	51.7 (45.9)	44.0 (41.5)	35.0 (36.2)	42.0 (40.4)	40.0 (39.4)	40.3 (45.0)
Pi.IV	65.0 (53.7)	45.0 (42.1)	50.0 (45.0)	53.3 (46.8)	49.0 (44.4)	41.0 (39.8)	44.0 (41.5)	44.7 (41.9)	39.0 (38.6)	30.0 (33.2)	36.0 (36.8)	38.3 (38.2)	45.4 (42.3)
Pi.V	57.0 (49.0)	41.0 (39.8)	44.0 (41.5)	47.3 (43.4)	47.0 (43.2)	37.0 (37.4)	40.0 (39.2)	41.0 (39.8)	33.0 (35.0)	26.0 (30.6)	30.0 (33.2)	29.7 (33.0)	39.4 (38.8)
Pi.VI	52.0 (46.1)	33.0 (35.0)	40.0 (39.2)	45.0 (42.1)	41.0 (39.8)	30.0 (33.2)	37.0 (37.4)	36.0 (38.8)	30.0 (33.2)	24.0 (29.3)	30.0 (33.2)	28.0 (31.9)	36.3 (37.5)
Mean	63.7 (52.9)	56.3 (48.6)	53.6 (47.0)	57.9 (49.5)	55.8 (48.3)	43.3 (41.1)	48.0 (43.8)	49.0 (44.4)	41.0 (39.8)	32.2 (34.5)	43.5 (41.2)	38.9 (38.5)	

(Figures in parantheses are transformed values)

SEd	S	Pi.	G	S x Pi.	S x G	Pi. x G	S x Pi. x G
	0.91	1.29	0.91	2.23	1.58	2.23	3.87
CD(P=0.05)	1.79	2.53	1.79	4.38	3.10	4.38	7.58

Table - 2 : Influence of season on seedling vigour (VI) in size grades of seeds from six pickings after accelerated ageing for 9 days at  $40^{\circ} \pm 1^{\circ}\text{C}$  and  $97 \pm 1\%$  cv. K2 Chillii

Pi.I	a	G <sub>1</sub>			G <sub>2</sub>			G <sub>3</sub>			Mean			
		S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>		S <sub>2</sub>	S <sub>3</sub>	Mean
Pi.I	a	973	440	650	688	727	390	570	562	338	195	312	282	511
	b	44.4	67.8	55.4	54.9	52.1	69.2	58.5	59.5	68.1	77.6	66.1	70.3	60.3
Pi.II	a	908	391	610	636	707	350	513	523	288	171	270	243	467
	b	45.9	70.2	58.7	52.3	52.1	69.1	61.0	60.3	71.3	79.4	70.0	73.3	62.3
Pi.III	a	804	329	556	563	662	293	468	474	242	140	231	204	414
	b	49.9	72.4	57.7	58.9	50.7	72.6	60.4	59.2	73.3	82.1	70.8	75.3	63.0
Pi.IV	a	713	273	475	487	590	246	400	412	195	113	180	163	354
	b	55.4	74.7	60.3	62.3	47.8	72.9	61.4	60.4	76.7	84.3	75.6	78.3	65.7
Pi.V	a	627	210	422	420	523	204	323	350	149	108	136	131	300
	b	58.5	79.2	60.1	63.5	55.0	75.4	66.1	64.3	81.5	83.8	81.0	82.1	68.6
Pi.VI	a	546	155	360	354	468	150	280	299	120	102	120	114	256
	b	58.5	83.1	64.1	67.2	53.0	81.3	69.0	66.8	84.1	83.7	82.3	83.4	71.2
Mean	a	762	300	512	526	613	262	426	437	222	138	208	189	
	b	51.0	73.8	59.1	60.1	51.4	72.9	62.2	61.4	71.0	81.6	73.7	76.6	

a) Vigour index after accelerated ageing b) Percentage of reduction in vigour due to accelerated ageing

	S	Pi.	G	S x Pi.	S x G	P x G	S x Pi x G
SEd	5.07	7.17	5.07	12.42	8.79	12.42	21.52
CD (P=0.05)	9.94	14.06	9.94	24.35	17.22	24.35	42.18

for 9 days. After ageing, the seeds were tested for germination and vigour.

## RESULTS AND DISCUSSION

### Germination after accelerated ageing :

The mean percentage of decrease in germination after accelerated ageing in large (G<sub>1</sub>), medium (G<sub>2</sub>) and smaller size seeds was 50.9, 40.6 and 34.9 respectively.

Among the seasons, the percentage of decrease in germination of G<sub>1</sub>, G<sub>2</sub> and G<sub>3</sub> was 29.1, 38.0 and 46.8 in S<sub>1</sub> : 41.1, 44.4 and 57.3 in S<sub>2</sub> and 35.4, 39.6 and 48.8 in S<sub>3</sub> respectively.

The decrease in germination increased from Pi.I to Pi.VI. Irrespective of the grades and season of production the extent of decrease in germination was in the increase from Pi. I to Pi.VI.

### Vigour after accelerated ageing :

The decrease in vigour was significantly more in G<sub>3</sub> than G<sub>1</sub> and G<sub>2</sub>. The influence of season was significant in all size grades. The decrease in vigour was significantly less in all grades of seeds obtained from S<sub>1</sub>. The per cent decrease in G<sub>1</sub>, G<sub>2</sub> and G<sub>3</sub> was 51.0, 51.4 and 71.0 in S<sub>1</sub>, 73.8, 72.9 and 81.6

in S<sub>2</sub> and 59.1, 62.2 and 73.7 in S<sub>3</sub> respectively.

Irrespective of the seasons the decrease was more in G<sub>3</sub> than G<sub>1</sub> and G<sub>2</sub>. Among the chosen pickings, the rate of decrease in vigour increased from Pi.I to Pi.VI. The percentage of reduction in G<sub>1</sub> ranged from 52.3 (Pi.II) to 67.2(Pi.VI); whereas in G<sub>2</sub> from 59.5 (Pi.I) to 66.8 (Pi.VI) and G<sub>3</sub> from 70.3 (Pi.I) to 83.4 (Pi.VI). Irrespective of seasons and pickings, the decrease in vigour was also less in G<sub>1</sub>.

Accelerated ageing which accelerated the senescence of a seed and deterioration in viability and vigour (Heydecker, 1972) helps to predict its storability (Delouche and Baskin, 1973). In the present study, small size (G<sub>3</sub>) seeds deteriorated faster than large size (G<sub>1</sub>). The deterioration in the size grades of seeds obtained from rabi was much slower than those from kharif seasons. Seeds from earlier pickings with stood ageing stress better than those from later pickings. Irrespective of size grades, higher the percentage of initial germination lesser was the rate of reduction of initial germination and vigour (Delouche and Baskin, 1973).

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