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STORABILITY OF CHILLI (*Capsicum annum* L.) SEED

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ABSTRACT

Seeds dried to a moisture content of 8 per cent and with an initial germination of 85 per cent recorded 73 per cent germination after 30 months of storage under ambient conditions. Slurry treatment with captan 75% WP at 2 g + DDT 50% WP at 200 mg/kg of seed was found better than untreated seeds. Seeds obtained from various pickings exhibited differences in their storability. Seed germination decreased with increase in storage; whereas E.C. increased with the increase in storage period.

Seed quality is not only influenced by prevailing external environmental conditions but also on the condition of storage (Harrington, 1960). Production of seed itself is a costly venture and the possibilities of carrying over of the unsold stock to the next season is inevitable in a competitive seed market. Therefore, reliable information for prolonging the shelf life of seed under storage will be of immense help to the seed producers.

MATERIALS AND METHODS

For evaluation, 20 g samples were made from seeds retained by 8/64" round perforated sieve separately from each picking obtained from a rabi season crop. The seed samples were given the following treatments: T_1 - Control without any treatment. T_2 - Seeds were slurry treated with Captan 75% WP @ 2 g+DDT 50% WP at 200 mg/kg of seed with 5 ml of water. The seeds were packed in cloth bags (C1) and polythese bags (C_2) of 700 guage thick and stored in the Department of Seed Technology, Tamil Nadu Agricultural University, Coimbatore under ambient condition. At trimonthly interval samples were drawn and the following estimations were made for 30 months (P_O - P_{10}) on germination and electrical conductivity.

RESULTS AND DISCUSSION

Germination

The mean germination after 30 months of storage was 72.8 and 75.9% in control and treated seeds respectively.

Among the pickings the mean germination ranged between 85.8 to 59.41 per cent. The highest and the lowest germination was in first and last pickings respectively.(Table 1). Untreated seeds from first four pickings maintained the standard germination of 70% upto 21 months in cloth bag and upto 31, 21, 24 and 21 months in C_2 respectively in the first four pickings. Seeds from fifth and sixth picking recorded 70 per cent germination only upto 6 and 3 months in cloth bags and upto 12 months in polythene bags. Treated seeds from six pickings maintained 70% germination upto 30, 24, 21, 24, 9 and 9 months in cloth bags and upto 30, 27, 24, 24, 15 and 15 months in polythene bags respectively.

Table 1. Percentage of germination as influenced by pickings, period of storage, containers and sed treatment chemicals in cv. K2 chilli.

		C1											Mean
		P_0	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}	
T_1	Pi. I	92 (73.5)	92 (73.5)	90 (71.5)	89 (70.6)	88 (69.7)	88 (69.7)	85 (67.3)	83 (65.6)	79 (62.7)	70 (56.7)	69 (56.1)	84.1 (66.5)
	Pi. II	92 (73.5)	92 (73.5)	87 (68.8)	79 (62.7)	75 (60.0)	79 (62.7)	74 (59.3)	72 (58.0)	55 (47.8)	51 (45.5)	51 (45.5)	73.4 (58.9)
	Pi. III	86 (68.0)	86 (68.0)	85 (67.2)	83 (65.6)	82 (64.9)	81 (64.1)	79 (62.7)	71 (57.4)	51 (45.5)	51 (45.5)	57 (49.0)	73.8 (59.3)
	Pi. IV	84 (66.4)	84 (66.4)	82 (64.9)	79 (62.7)	78 (62.0)	77 (61.3)	75 (60.0)	71 (57.4)	67 (54.9)	59 (50.1)	53 (46.7)	73.5 (59.0)
	Pi.V	79 (62.7)	78 (62.0)	71 (57.4)	63 (52.5)	57 (49.0)	53 (46.7)	59 (50.1)	57 (49.0)	47 (43.2)	43 (40.9)	39 (38.6)	58.7 (50.0)
	Pi.VI	75 (60.0)	74 (59.3)	69 (56.1)	65 (53.7)	59 (50.1)	51 (45.5)	47 (43.2)	47 (43.2)	47 (43.2)	43 (40.9)	39 (38.6)	56.0 (48.4)
	Mean	84.7 (66.9)	84.3 (66.6)	76.3 (60.8)	73.2 (58.8)	71.5 (57.7)	71.5 (57.7)	69.8 (56.6)	66.8 (54.8)	57.7 (49.4)	52.8 (46.6)	51.3 (45.7)	69.9 (56.7)

		C2											Mean
		P_0	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}	
T_1	Pi. I	92 (73.5)	92 (73.5)	91 (72.5)	90 (71.5)	90- (71.5)	89 (70.6)	88 (69.7)	84 (66.4)	81 (64.1)	79 (62.7)	74 (59.3)	86.4 (68.3)
	Pi. II	92 (73.5)	92 (73.5)	89 (70.6)	88 (69.7)	84 (66.4)	81 (64.1)	80 (63.4)	70 (56.7)	68 (55.5)	64 (53.1)	62 (51.9)	80.0 (63.4)
	Pi. III	86 (68.0)	86 (68.0)	84 (66.4)	83 (65.6)	82 (64.9)	81 (64.1)	80 (63.4)	79 (62.7)	70 (56.7)	68 (55.5)	60 (50.7)	78.0 (62.0)
	Pi. IV	84 (66.4)	84 (66.4)	82 (64.9)	81 (64.1)	80 (63.4)	79 (62.7)	78 (62.0)	76 (60.0)	64 (53.1)	60 (50.5)	58 (49.6)	75.1 (60.0)
	Pi.V	79 (62.7)	79 (62.7)	76 (60.6)	74 (59.3)	70 (56.7)	68 (55.5)	66 (56.3)	64 (53.1)	63 (52.3)	60 (50.7)	53 (55.8)	68.4 (55.8)
	Pi.VI	75 (60.0)	75 (60.0)	74 (59.3)	72 (58.0)	71 (59.4)	69 (56.1)	67 (54.9)	65 (53.7)	57 (49.0)	54 (47.2)	49 (44.4)	66.2 (54.4)
	Mean	84.7 (66.9)	84.6 (66.8)	82.7 (65.4)	81.3 (64.3)	79.5 (63.0)	77.8 (61.0)	76.5 (61.0)	73.0 (58.6)	67.2 (55.0)	64.2 (53.2)	59.3 (50.3)	75.7 (60.4)

		C1											Mean
		P_0	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}	
T_2	Pi. I	92 (73.5)	92 (73.5)	91 (72.5)	90 (71.5)	89 (70.6)	88 (69.7)	87 (68.8)	84 (66.4)	80 (63.4)	79 (62.7)	75 (60.0)	85.2 (67.3)
	Pi. II	92 (73.5)	92 (73.5)	89 (70.6)	86 (68.0)	84 (66.4)	82 (64.9)	80 (63.4)	76 (60.6)	72 (58.0)	68 (55.5)	62 (51.9)	80.3 (63.6)
	Pi. III	86 (68.0)	86 (68.0)	86 (68.0)	84 (66.4)	83 (65.6)	82 (64.9)	80 (63.4)	72 (58.0)	68 (55.5)	66 (56.3)	60 (50.7)	77.5 (61.6)
	Pi. IV	84 (66.4)	84 (66.4)	83 (65.6)	82 (64.9)	81 (64.1)	80 (63.4)	78 (62.0)	76 (60.6)	72 (58.0)	66 (56.3)	60 (50.7)	76.9 (61.2)
	Pi.V	79 (62.7)	79 (62.7)	76 (60.6)	72 (58.0)	68 (55.5)	66 (56.3)	64 (53.1)	61 (51.3)	60 (50.7)	57 (49.0)	52 (46.1)	66.7 (54.7)
	Pi.VI	75 (60.0)	75 (60.0)	73 (58.6)	72 (58.0)	64 (53.1)	62 (51.9)	60 (50.7)	58 (49.6)	56 (48.4)	52 (46.1)	48 (43.8)	63.2 (52.6)
	Mean	84.7 (66.9)	84.7 (66.9)	83.0 (65.6)	81.0 (64.1)	78.7 (62.5)	76.7 (61.1)	74.8 (59.8)	71.2 (57.5)	68.0 (55.5)	64.7 (53.5)	54.5 (47.5)	75.0 (60.0)

		C_2											Mean
		P_0	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}	
T_2	Pi. I	92 (73.5)	92 (73.5)	92 (73.5)	91 (72.5)	90 (71.5)	90 (71.5)	89 (70.6)	88 (69.7)	83 (65.6)	80 (63.4)	76 (60.6)	87.5 (69.3)
	Pi. II	92 (73.5)	92 (73.5)	91 (72.5)	89 (70.6)	86 (68.0)	83 (65.6)	82 (64.9)	79 (62.7)	75 (60.0)	70 (56.7)	64 (53.1)	82.1 (64.9)
	Pi. III	88 (68.0)	88 (68.0)	87 (68.8)	86 (68.0)	85 (67.2)	83 (65.6)	82 (64.9)	78 (62.0)	72 (58.0)	69 (56.1)	62 (51.9)	80.0 (63.4)
	Pi. IV	84 (66.4)	83 (65.6)	83 (65.6)	83 (65.6)	82 (64.9)	81 (64.1)	79 (62.7)	77 (61.3)	72 (58.0)	68 (55.5)	62 (51.9)	77.6 (61.7)
	Pi.V	79 (62.7)	79 (62.7)	78 (62.0)	76 (60.6)	72 (58.0)	70 (56.7)	68 (55.5)	66 (56.3)	64 (53.1)	57 (49.0)	54 (47.2)	69.4 (56.4)
	Pi.VI	75 (60.0)	75 (60.0)	75 (60.0)	74 (59.3)	72 (58.0)	70 (56.7)	68 (55.5)	66 (56.3)	60 (50.7)	56 (48.4)	50 (45.0)	67.3 (55.1)
	Mean	84.7 (67.2)	84.8 (67.0)	84.3 (66.6)	83.2 (65.8)	81.2 (64.3)	79.5 (63.0)	78.0 (62.0)	75.7 (60.4)	71.0 (57.4)	66.7 (54.7)	61.3 (51.5)	76.8 (61.1)

	P	Pi.	C	T	P x Pi.	P x C	P x T	Pi. x C	Pi. x T	C x T
SEd	0.2	0.16	0.09	0.09	0.5	0.3	0.3	0.2	0.2	0.13
CD (P=0.05)	0.4	0.32	0.18	0.18	1.0	0.6	0.6	0.4	0.4	0.26

Electrical conductivity

The mean values for untreated and treated seeds stored in cloth bags and seeds stored in polythene bags were 65, 54, 64 and 56 Mmhos/cm respectively. The mean values among the pickings ranged between 53 and 57 Mmhos/cm and between periods 23 to 98 Mmhos/cm. The difference between treated and untreated seeds stored in both the containers was significant from third picking onwards. The difference in electrical conductivity values among pickings was significant from second picking onwards.

Abdalla and Roberts (1969) reported that the percentage of germination is an excellent indication of growth potential of the surviving seeds irrespective of the factors responsible for the loss of viability. In the present study seeds stored in P-AF-P pouches recorded high germination thirty months after storage as compared to those in cloth bag.

The usefulness of moisture vapour proof containers for storing seeds for longer period can also be exemplified by the behavious of the seeds obtained from the last two pickings.

Decrease in germination was evident with increase in the storage period. However, the rate of decrease was rather gradual upto 21 months in moisture proof containers; whereas it was faster from 6th month onwards in the cloth bag.

Organic fungicides are beneficial as they di not often impair the germination potential unde favourable storage conditions. In the presen investigation, seeds treated with captan + DD maintained a higher germination for a longe duration of storage than the untreated seeds/

Harvest conditions also decide the storabilit of the seeds as influenced by the prevailin environmental conditions (Highkin, 1958). In th present study, seeds obtained from the first pickin stored well for a longer time than those obtaine from fifth and sixth pickings. The rate o deterioration was also faster in seed obtained fro the later pickings. The presence of larger number o immatured seeds deficient of certain essentia nutrients due to the onset of senescenc (Harrington, 1972) may be the possible cause fo poor storability of the seeds obtained from the las pickings.

The low electrical conductivity of seed leachate had amply revealed the superiority of the moisture proof containers for storing the seeds. High electrical conductivity of seed leachate might have been accompanied by reduction in mobilization efficiency, synthesis of DNA and RNA and Ribosome enzyme activity (Srivastava, 1975) and increased premeability arising out of oxidation of polar lipids of the nembrane producing more pores (Koostra and Harrington, 1969).

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RESEARCH NOTES

CORRELATION STUDIES IN COWPEA (*Vigna unguiculata* (L.) WALP.) FOR SEED YIELD

In cowpea, reports on correlation between yield and yield related characters are limited. Hence, an attempt has been made to obtain pertinent information with 14 genotypes in a line X tester model. Ten geographically diverse lines (Paiyur 1, Km 1, Co 2-1, 1-26, Covu 95, Covu 358, Covu 623, No 417, No 985 and No 1208) and four well adapted and released varieties (Co 2, Co 3, Co 4 and C 152) constituted the experimental material for the present study. All the 14 parents and 40 hybrids (4 X 10) were sown in field in a randomised block design with three replications during *Khariff*, 1991 in the Agricultural College and Research Institute, Killikulam. With the data obtained, genotypic correlation co- efficients were workedout to findout the association between yield and yield components and the results are presented in Table 1.

From the present study it is observed that seed yield per plant had significant positive association with plant height, branches per plant, cluster of pods per plant, pods per plant, pod length, seeds per pod and hundred seed weight. Similar findings were observed earlier for plant height, cluster of pods per plant, pods per plant, pod length and seeds per pod by Thiyagarajan and Rajasekaran (1989), for cluster of pods per plant, pods per plant, pod length and seeds per pod by Birdar *et al.* (1991) and Oseni *et al.* (1992), for cluster of pods per plant, pods per plant and seeds per pod by Marangappanvar (1986). This clearly indicates selection based on these traits will simultaneously improve the yield.

The inter correlation of plant height with days to 50 per cent flowering, cluster of pods per plant, pod length and hundred seed weight was found to be positive. Similarly, pod length showed positive association with seeds per pod and hundred seed weight. The positive relationship indicates long pods can accomodate more number of seeds which

Table 1. Estimate of correlation Co-efficient among yield Components.

Variable	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
X_1	0.5618**	-0.062	0.1588*	0.0456	0.1571**	-0.0985	0.1914*	0.3018**
X_2		-0.3561**	-0.2263**	-0.3822**	-0.1766*	-0.1473*	-0.1102	-0.3056**
X_3			0.6671**	0.7468**	-0.2432**	-0.1479*	-0.1739*	0.3321**
X_4				0.9194**	-0.1991**	-0.1882	-0.2179**	0.5606**
X_5					-0.2066**	-0.0880	-0.2156**	0.5569**
X_6						0.8613**	0.6396**	0.4349**
X_7							0.5963**	0.4675**
X_8								0.5505**

* - Significant at 5 per cent level ** - Significant at 1 per cent level X_1 - Plant height (cm) X_2 - Days to 50 per cent flowering X_3 - Branches per plant X_4 - Clusters per plant X_5 - Pods per plant X_6 - Pod length (cm) X_7 - Seeds per pod X_8 - 100 seed weight (g) X_9 - Seed yield per plant (g)