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EFFECT OF SEED TREATMENT WITH FUNGICIDES AND INSECTICIDES ON THE VIABILITY OF PEARL MILLET SEEDS DURING STORAGE

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Seeds treated with carbendazim at 2 g + thiram at 6 g per kg and thiram at 6 g per kg of seed recorded higher germination than untreated seeds. A standard slurry treatment of DDT 50% WP at 200 mg with 2 g of thiram per kg of seed also recorded higher germination. However, germination in seeds treated with HCH and malathion at 10 g per kg of seed recorded lower germination.

Nowadays it has become a general practice to treat the seeds with fungicides to control the seedborne fungi. In Denmark a profit of 8 to 9 million dollars was obtained in a single year by cereal seed treatment with fungicides (Stapel, 1966). Sivaprakasam *et al.* (1975) reported higher germination in sorghum seeds treated with thiram, benomyl, carboxin and captan at 0.2 per cent throughout the period of 8 month of storage. The present study reports the efficacy of fungicides and insecticides on the viability of pearl millet seeds during storage.

MATERIALS AND METHODS

Freshly harvested pearl millet seeds of cultivar Co. 7 were dried to 10 per cent moisture content and treated with fungicides, insecticides and also their combinations. Five hundred grams of seeds were treated with fungicides *viz*, carbendazim at 2 g per kg, thiram at 6 g per kg and carbendazim at 2 g + thiram at 6 g per kg and insecticides *viz.*, HCH 10% dust, malathion dust and activated kaolin at 10 g per kg as dry seed dressing. The seeds were shaken with fungicides and insecticides in a plastic container for 15 minutes. In the combination of seed treatment with fungicides and insecticides the seeds were treated first with fungicides and 24 hours later with insecticides and stored. A standard slurry treatment of DDT 50% WP at 200 mg with 2 g of thiram per kg of seed was also included. In the slurry treatment the seeds were treated with chemicals in a flask in which 0.125 g of gum and 5 ml of water per kg of seed were added and shade dried for one day. One lot of seed was left untreated to serve as control. The treated and untreated seeds were stored in gunny bags for five months at laboratory conditions (30 ± 2°C) and relative humidity varying from 60 to 90 per

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Table 1. Interaction between fungicides and periods on the viability of seeds in per cent

Fungicides	Period after seed treatment in months						
	0	1	2	3	4	5	Mean
Carbendazim	81.50	81.00	80.75	83.00	73.50	73.50	79.71
	(64.84)	(64.46)	(64.32)	(65.78)	(62.55)	(59.20)	(62.53)
Carbendazim + Thiram	88.00	83.00	84.50	80.50	81.50	78.00	82.58
	(70.17)	(65.96)	(67.09)	(64.32)	(65.09)	(62.24)	(65.81)
Thiram	88.00	84.00	83.50	82.00	77.50	75.50	81.75
	(70.10)	(67.13)	(66.61)	(66.26)	(62.00)	(60.76)	(65.48)
Control	78.00	80.50	80.00	78.00	76.50	76.50	78.25
	(62.10)	(63.95)	(63.60)	(62.22)	(61.45)	(61.08)	(62.40)
Mean	83.88	82.13	82.19	80.88	78.50	75.08	
	(66.80)	(65.38)	(65.50)	(64.65)	(62.77)	(60.80)	

(Figures in parentheses represent transformed values)

Comparison of significant effects

	S.E.	C.D. (P=0.05)
Periods	0.71	1.99
Fungicides	0.58	1.63
Fungicides and Periods	1.42	N.S

Table 2. Interaction between insecticides and periods on the viability of seeds in per cent

Insecticides	Period after seed treatment in months						
	0	1	2	3	4	5	Mean
HCH	82.00	80.50	83.00	80.00	77.50	74.50	79.58
	(65.17)	(63.98)	(65.82)	(63.53)	(61.95)	(59.80)	(63.38)
Malathion	81.00	77.50	77.25	77.50	73.50	70.00	76.13
	(64.36)	(61.77)	(61.75)	(61.87)	(59.18)	(56.91)	(60.97)
Activated Kaolin	85.50	83.50	85.00	84.50	81.00	78.00	82.92
	(68.01)	(66.31)	(67.59)	(67.03)	(64.36)	(62.08	(65.90)
Control	87.00	87.00	83.50	81.50	82.00	81.00	83.17
	(96.67)	(69.45)	(66.45)	(66.15)	(65.60)	(64.50)	(66.97)
Mean	83.38	82.13	82.19	80.88	78.50	75.88	
	(66.80)	(65.38)	(65.40)	(64.65)	(62.77)	(60.82)	

(Figures in parentheses represent transformed values)

Comparison of significant effects

	S.E.	C.D. (P = 0.05)
Periods	0.71	1.99
Insecticides	0.58	1.63
Insecticides and periods	1.42	N.S

cent. The germination test was conducted by roll towel method proposed by International Seed Testing Association (9876),

RESULTS AND DISCUSSION

Seeds treated with carbendazim + thiram and thiram recorded higher germination percentages of 82.58 and 81.75 respectively as against 78.25 in control. There was no significant change in germination percentage up to a period of two months after seed treatment (Table 1). Grewal and Kapoor (1966) reported treatment with fungicide prolonged the viability of seeds. The beneficial effect of seed treatment with fungicides on germination was reported by Suhag (1973) in soybean and Sivaprakasam *et al.* (1975, 1976a, 1976b and 1977) in sorghum and sunflower. Mahendra Pal and Grewal (1985) found that seed treatment with a combination product of carbendazim + thiram had beneficial effects on germination in pigeonpea. Seeds treated with DDT + thiram also recorded higher germination (Table 3). Ramadoss and Sivaprakasam (1987) reported that seed treatment with carbendazim in combination with an insecticide carbosulfan increased germination of cowpea seeds. In the present study, germination in seeds treated with HCH and malathion recorded lower germination (Table 2). Minton (1972)

Table 3. Interaction between treatments DDT + Thiram (standard) and rest of treatments and periods on the viability of seeds in per cent

Treatment	Period after seed treatment in months						
	0	1	2	3	4	5	Mean
Rest of treatments	83.88 (66.80)	82.13 (65.38)	82.19 (65.40)	80.88 (64.65)	78.50 (62.77)	75.88 (60.82)	80.58 (64.30)
DDT + Thiram (Standard)	86.00 (68.08)	90.00 (71.65)	84.00 (68.08)	86.00 (68.50)	84.00 (66.58)	84.00 (63.42)	85.67 (67.72)
Mean	84.00 (66.88)	82.59 (65.77)	82.29 (65.55)	81.18 (64.87)	78.82 (63.00)	76.35 (61.16)	

(Figures in parentheses represent transformed values)

Comparison of significant effects

	S.E.	C. D. (P = 0.05)
Periods	0.71	1.99
Treatments	0.29	0.81
Periods and treatments	0.71	N. S

reported that seed treatment with quintozene and disulfoton used alone and in combination reduced the germination of cotton seeds. Reduction in seed germination due to treatment with chlorpyriphos was also reported by Ramadoss and Sivaprakasam [1987].

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