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EFFECT OF SEED TREATMENTS OF CHEMICAL AND PLANT ORIGIN ON SEED VIABILITY OF SUNFLOWER EC 68413.

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Sunflower seeds dried to 8 per cent moisture could be stored for six months in cloth bag without appreciable loss in viability and vigour. Seeds treated with the seed protectants of plant origin viz., *Azadirachta indica Vitex negundo, Nicotiana tabacum* and *Acacia Concinna*, stored well for 9 month under ambient conditions. while those seeds treated with Captan (200g/100 kg of seed) maintained 76 per cent germination upto 12 months both in cloth bag and paper-aluminium foil-polyethylene laminated pouch.

Longivity of seed depends on the species and the conditions under which it is stored. The deterioration process can be mitiggated by the use of seed protectants, which control the storage pests and systemic and non-systemic fungicides which control seed borne diseases. A particular seed treatment may or may not be conducive to one or more kinds and varieties of seed. So also the seed moisture content, packaging material and the temperature and relative humidity of the storage environment may restrict the choice of seed protectants. With this in view, storage studies were carried out with the seeds of the sunflower EC 68413. The seeds were treated with seed protectant of plant origin and Captan and stored in cloth bag and paper-aluminium foil-polyethylene laminated pouch (PAFP) under ambient conditions prevailed at Coimbatore.

METERIAL AND METHODS

Bulk seeds of sunflower EC 68413, pre-cleaned and dried to 8 per cent moisture content were treated separately with tobacco leaf powder (*Nicotiana tabacum*). nochi leaf powder (*Vitex negundo*), Arappu (*Albizzia amara*), neem leaf powder (*Azadirachta indica*), powdered fruit rind of Poochikottai (*Sapindus emarginatus*) and soapnut powder (*Acacia Concinna*) as dry dressing at 1:100 ratio by weight. Slurry treatment with captan 75% WDP at 200g/100 kg of seed in 500 ml of water formed the chemical treatment. Untreated seeds served as check. Treated and untreated seeds were separately packed in gada cloth bag and paper aluminium foil-polyethylene laminated pouch (PAFP) and stored under ambient temperature and relative humidity for 18 months.

The seeds were tested for germination, once in three months follow-

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ing the method suggested by ISTA (Anonymous 1976). The shoot and root length of ten randomly selected seedlings were recorded at the time of germination evaluation. The same seedlings were then packed separately and dried in the hot air over at 85 ± 2° C and the dry weight was recorded in mg.

For membrane permeability test (Presley, 1958), fifty seeds were soaked in 50 ml of distiiled water for 16 hours under room temperature. The electrical conductivity of the seed-steep water was measured in an Elico type CM 82 conductivity bridge with a cell constant of 1:1 and expressed as micro mhos/cm.

RESULTS AND DISCUSSION

The germination percentage of seeds treated and stored in cloth bag ranged from 55 (*Nicotianatabacum)* to 83 (Captan) and that stored in paper aluminium foil polyethylene pouch ranged from 66 (*Nicotiana tabacum*) to 90 (Captan) after 3 months of storage (Table 1). The untreated seeds on the other hand recorded 71 and 84 per cent, respectively in cloth bag and paper aluminium foil polyethylene pouch. The germination percentage of seeds stored in cloth bag dropped to 62 and below in six months of storage except those seeds treated with Captan. The seeds treated with captan, *Vitex negundo*, *Sapindus emarginatus* and *Albizzia amara* and stored in paper aluminium foil polyethylene pouch recorded more than 80 per cent germination on the 6th month of storage. The seeds treated with captan and stored both in cloth bag and paper aluminium foil polyethylene pouch maintained 76 per cent germination upto 15 months.

The decreasing trend in viability of stored seed with advancement of storage period was in conformity with the findings of Brison (1942) in onion, Agrawal and Surenderkaur (1975) and Min *et al* (1976) in soybean, Dharmalingam *et al* (1976) and Rajendran (1976) in blackgram and Agrawal (1980) in lentil and peas. Higher percentage of germination of treated seeds stored in cloth bag, a moisture pervious container and in paper aluminium foil polyethylene pouch, a moisture vapour proof container was in conformity with the findings of Ashokan *et al* (1981) in finger millet. The beneficial effect of the chemical treatment in retaining the loss of viability of stored seeds was also broughtout by Baysls (1941) in wheat, Singh and Manrya (1972) in soybean and Ramamoorthy (1977) in groundnut.

The mean root and shoot length (Table 2) of the seeds stored in different containers and with various seed treatments did not differ significantly due to treatments and containers within the period of testing; whereas, it differed between periods of storage. The same trend was followed in the drymatter production of seedlings (Table 2). The results of seedling growth and dry matter production were in conformity with the findings of Tewari and Gupta (1981) in sunflower. The electrical conductivity of the seed leachate in-

creased with advancement in storage period; however the differences were not significant with in the period o testing.

The loss in viability was the cu mulative effect of the physical, phy siological and biochemical deteriora tive changes occured in seeds due tc ageing and senescence (Harrington 1972). Irrespective of treatments de crease in vigour of the stored seeds was concomitant with the increase ir storage period (Dharmalingam *et al* 1976 and Rajendran, 1976 in black gram and Ramamoorthy, 1977 in Peanut).

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Table 1. Effect of seed treatment and storage containers on seed germination (%) sunfower

Treatments	Container	Initial	Months of storage					
			3	6	9	12	15	18
Control	a	82	84	84	50	43	42	—
	b	"	71	56	53	41	43	—
Azadirachta indica	a	"	84	79	62	51	56	41
	b	"	63	68	63	55	50	4
Vitex negundo	a	"	83	82	65	64	66	34
	b	"	72	53	67	60	58	2
Nicotiana tebacum	a	"	66	68	62	60	57	13
	b	"	65	69	63	57	50	2
Sapindus emarginatus	a	"	85	81	40	37	37	21
	b	"	68	58	33	35	33	—
Acacia concinna	a	"	83	79	70	65	57	23
	b	"	67	52	64	59	50	5
Albizzia amara	a	"	85	85	54	51	34	34
	b	"	78	60	66	56	44	2
Captan	a	"	93	89	87	76	76	50
	b	"	83	83	82	76	76	31

Table 2. Effect of seed treatment and storage containers on seed quality in sunflower EC 68413-Mean root and shoot length (cm) and dry matter production mg/10 seedlings)

Treatments		Initial			Months of storage														
					3			6			12			18					
		R	S	DM	R	S	DM	R	S	DM	R	S	DM	R	S	DM	R	S	DM
Control	a	5.4	18.9	600	4 0	17 0	300	4 2	16.5	250	2 8	16·0	250	1.5	15 1	240	—	—	—
	b	5.4	18.9	600	2.1	18 1	300	2.9	17.1	270	3 2	15.2	270	2 2	13.2	230	—	—	—
Azadirachta	a	,,	,,	,,	3.5	17.0	220	1.6	17 6	500	2.0	15.5	350	2.1	13.3	320	1.8	12.9	300
indica	b	,,	,,	,,	4.4	17.0	220	3.2	16 8	300	2 2	14.2	300	1 8	13.5	280	1 8	12.6	260
Vitex	a	,,	,,	,,	3 3	19 1	450	3.9	14.9	300	3 5	14 0	300	3.0	13.5	280	3.0	13.0	250
negundo	b	,,	,,	,,	5.3	16.4	300	3.1	16 3	300	3 2	15.0	280	2.8	11.5	260	2 2	14 0	—
Nicotiana	a	,,	,,	,,	3 5	16.0	250	3.1	16 8	270	3.0	15.5	270	2 5	11.0	250	2.2	13.5	—
tabacum	b	,,	,,	,,	4 0	17 1	200	3.5	19.0	310	3 2	16.2	250	2.2	15 6	2.50	2 3	14 6	—
Sapindus	a	,,	,,	,,	4 1	18.0	300	3.9	18 8	500	3 7	17.2	320	3.2	17.0	260	2.8	—	250
emarginatus	b	,,	,,	,,	5.2	17.5	320	8.9	17.9	5.00	3 6	17.4	360	3 1	16 0	250	—	—	—
Acacia concinna	a	,,	,,	,,	3 8	15.9	250	4.4	16.2	300	4.5	16.0	320	4.0	15.5	310	2.9	15.0	280
	b	,,	,,	,,	2 0	14 1	200	3 9	16.3	300	3.3	15 2	270	3.5	14 5	260	3.2	14.0	—
Albizziaamara	a	,,	,,	,,	4 0	16.5	200	3.2	18.3	300	3.1	16.3	270	2 4	15.0	260	2 8	14.2	240
	b	,,	,,	,,	4 4	11.5	200	4.1	15.1	300	4.0	14.1	260	2 0	14.2	250	1 8	13.5	—
Captan	a	,,	,,	,,	4 7	16.6	300	3.6	17.2	300	3.5	17.2	320	3.1	16.5	310	2.8	14.2	320
	b	,,	,,	,,	4.9	17.7	300	3.9	18 8	300	3.6	17.5	300	3.5	16.2	300	2.6	13.2	270

R = Root S = Shoot DM = Dry matter production a = Aluminium foil pouch b = Cloth bag

— Not significant.