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MID-STORAGE SEED TREATMENT TO MAINTAIN VIGOUR AND PRODUCTIVITY OF HYBRID COTTON DCH.32

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ABSTRACT

Mid-storage treatment can be successfully employed to prolong the shelf-life of unsold stock of hybrid cotton seeds. Ten month stored DCH.32 hybrid cotton seeds were given different mid-storage treatments and stored again for another eight months. Mid-storage treatments by soaking 2 h in disodium phosphate (10^3-m) maintained higher germination during subsequent storage. The result of the field trial did not reveal significant differences in growth parameters and kapas yield between the fresh (2 month old) and mid- storage treated seeds when equal population was maintained in the field.

KEY WORDS: Hybrid Cotton Seeds, Mid Storage Treatment, Vigour, Productivity

Hybrid cotton seed produced at very high cost has to be stored for a minimum period of 15 month if unsold since, the first and second validity periods are nine and six months respectively. Inspite of high initial vigour and viability, seed deterioration is fast due to lack of controlled storage facilities with the seed producers in India. Therefore, inexpensive, simple and practicable technology to prolong the shelf-life of hybrid cotton seed under storage is immensely needed. A number of investigations have been made to prolong the storage life of seeds by soaking them in water or dilute solutions of salts, phenols etc. at about the mid-storage period followed by drying back to the original moisture content in different crop seeds (Basu and Das Gupta, 1978). In the present study, attempts were made to correlate the production potential of the hydrated-dehydrated seeds, besides evaluating the effect on viability maintenance.

MATERIAL AND METHODS

Ten month old DCH.32 hybrid cotton seed with 60 per cent germination was taken for the study. Half the quantity of the seed was delinted. dried, cleaned and tested for germination (65%). Then both fuzzy and delinted seeds, dried to 8 per cent moisture content, were given the following mid-storage treatments.

T_1 : Water soaking for 2 h
T_2 : Disodium phosphate solution (10^3m) for 2 h
T_3 : Dithane M-45 solution (0.5%) for 2 h
T_4 : Moisture equilibration for 24 h
T_5 : Moisture equilibration for 36 h
T_6 : Control

After hydration, the seeds were dried back, initially under shade and then sun until the moisture content was reduced to 8 per cent and evaluated for germination. The untreated control seeds were not hydrated but dried along with other seeds. Subsequently all the seeds were treated with thiram @ 2 g/kg of seed and packed in cloth bags and stored under ambient conditions. Eight months after storage, the seeds were evaluated for germination (ISTA, 1985) dry weight of seedlings and vigour index. A field trial was conducted in factorial randomised block design with four replications to assess the planting value and production potential of treated seeds along with the freshly harvested seeds with 72 per cent germination as control. The control seeds (T_6) was not included in the field trial since the germination was very poor. An uniform plant population was maintained in all the plots by suitably adjusting the seed rate and through subsequent gap filling. The biometrical observation like plant height (120th day), number of sympodia, number of burst bolls and kapas yield were recorded.

RESULTS AND DISCUSSION

The different mid-storage treatments did not influence,significantly, the germination of both fuzzy and delinted seeds immediately after treatment (Table 1). The mid-storage treatment given to 10 month-old seeds retarded the seed deterioration during subsequent storage when

Table 1. Effect of mid-storage treatments on seed germination and vigour in DCH-32 hybrid cotton

Treatments	Germination, soon after treatment (%)		Treated and eight months stored Germination		Dry weight of seedling (mg/seedling)		Vigour index	
	Fuzzy	Delinted	Fuzzy	Delinted	Fuzzy	Delinted	Fuzzy	Delinted
T_1	60	67	53	58	50	48	2650	2784
T_2	60	65	57	62	54	52	3078	3224
T_3	59	66	55	60	52	49	2860	2940
T_4	61	65	56	58	51	50	2856	2900
T_5	61	67	54	55	50	48	2700	2640
T_6 (Control)	60	65	38	40	46	45	1748	1800
CD (P=0.05%)	NS	NS	3.8	3.6	3.5	3.3	168	172

Table 2. Effect of mid-storage treatments on plant growth and production potential in DCH.32 hybrid cotton

Treatments	Plant height on 120th day (cm)		No. of sympodia per plant		No. o burst bolls/plant		Kapas yield per plant (g)	
	Fuzzy	Delinted	Fuzzy	Delinted	Fuzzy	Delinted	Fuzzy	Delinted
T_1	115.6	114.8	13.4	15.4	25.9	25.9	87.4	86.9
T_2	116.4	117.9	13.2	15.3	24.3	26.3	89.2	90.8
T_3	114.1	116.7	13.4	15.0	22.8	26.4	86.6	91.8
T_3	114.1	116.7	13.4	15.0	22.8	26.4	86.6	91.8
T_4	115.6	116.5	13.0	14.2	23.6	24.5	95.9	87.3
T_5	109.9	113.3	14.4	15.0	24.0	25.8	94.3	91.1
T_6 (Freshseed)	116.0	116.2	14.7	15.1	25.1	25.8	94.6	92.8
CD (P=0.05%)	NS	NS	NS	NS	NS	NS	NS	NS

compared to control. In comparision to the water soaking and moisture equilibration treatments, substantial increase in germination percentage was obtained with disodium phosphate. Similar result was reported in MCU 5 cotton (Dharmalingam and Basu, 1978). The treated seeds also registered significantly higher value for dry matter production and vigour index, than control.

The results of field trial (Table 2) revealed that there were no significant differences in plant height, and yield parameters between the treated and fresh seeds, used as control. Non- significant results obtained in respect to yield parameters from the plants sown with 18 months -old and fresh seeds indeed is of great significance. It was reported beyond apprehension that loss of vigour in seeds affects the productivity of the resultant crop (Harrison, 1966) The mid- storage hydration-dehydration treatments given to 10 month-old seeds invariably showed higher viability of stored cotton seeds but also to obtain higher yield from stored seeds.

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