

EFFECT OF N, P AND K ON SORGHUM CSH 5 HYBRID SEED CROP III. SEED STORABILITY

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CSH 5 hybrid seeds obtained from the plants given 0, 100 and 200 kg/ha of N, and 0, 50 and 100 kg/ha of P_2O_5 and K_2O each were subjected to accelerated ageing at $40 \pm 1^\circ C$ and 95 per cent relative humidity for seven days. Germination of aged seeds revealed that each of the nutrient at 100 kg/ha had significantly improved the seed storability.

Storability is an important attribute determining the value of a seed. Among the various pre harvest environmental factors determining seed storage, mother plant nutrition plays a vital role (Justice and Bass, 1976). Hence, studies were initiated to elucidate information on the effect of N, P and K on the storage of CSH 5 hybrid seed.

MATERIALS AND METHODS

A seed crop of sorghum CSH 5 hybrid (ms 2077A x CS 3541) was raised during the winter season of 1979 in the Department of Seed Technology, Tamil Nadu Agricultural University. The mother plant, ms 2077 A was given 0 (N_0), 100 (N_1) and 200 (N_2) kg/ha of N; 0 (P_0), 50 (P_1) and 100 (P_2) kg/ha of P_2O_5 and 0 (K_0), 50 (K_1) and 100 (K_2) kg/ha of K_2O in the forms of urea (46% N), superphosphate (16% P_2O_5) and muriate of potash (60% K_2O), respectively.

Full dose of P and K and half of the dose of N were applied as basal dressing at the time of sowing of the female line and the remain-

ing dose of N, 30 days afterwards. The recommended cultural and plant protection measures were followed.

Of the two rows of male line, one was sown nine days and the other twelve days after sowing the female line to achieve synchronisation of flowering (Krishnasamy and Ramaswamy, 1979).

The bulk hybrid seeds harvested from individual plots were graded with sieves having 10/64" (G_1), 9/64" (G_2) and 8/64" (G_3) round holes. The graded seeds from each replication were pooled treatmentwise and gradewise. They were mixed thoroughly and samples were drawn so as to have sufficient quantity of seeds for accelerated ageing at $45 \pm 1^\circ C$ and 95 per cent Relative Humidity (Delouche and Baskin, 1973) for seven days. The aged seeds were germinated (ISIA, 1976) in paper medium and the percentage germination was recorded.

RESULTS AND DISCUSSION

Accelerated ageing caused by exposing seeds to an unfavourable

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Table 1. Effect of application of N, P and K on mean germination (angular values of percentage) after accelerated ageing in three size grades of CSH 5 hybrid seed.

		P ₀			P ₁			P ₂		
		K ₀	K ₁	K ₂	K ₀	K ₁	K ₂	K ₀	K ₁	K ₂
G ₁	N ₀	49.0	46.9	55.9	51.9	52.5	45.0	57.0	54.5	52.8
	N ₁	50.8	56.8	55.6	54.5	56.0	55.9	53.1	54.9	53.9
	N ₂	55.6	50.7	46.2	43.7	58.2	54.9	54.3	51.9	59.3
G ₂	N ₀	50.2	48.5	51.9	52.8	53.6	53.3	50.5	54.0	48.9
	N ₁	47.5	56.2	54.5	50.5	54.3	57.9	54.8	60.7	51.9
	N ₂	54.5	51.7	47.9	51.9	53.1	59.0	47.9	55.6	56.0
G ₃	N ₀	43.5	45.9	52.1	50.8	44.4	45.9	43.7	45.5	50.4
	N ₁	44.4	48.6	48.7	47.2	52.2	46.6	49.6	60.2	54.2
	N ₂	43.0	50.8	51.5	45.5	50.8	51.4	51.5	57.7	48.5

Table 1a. Interaction between (i) size grades and N, P and K; (ii) N and P; (iii) P and K; (iv) N and K - germination after accelerated ageing (Angular values of percentages)

	N ₀	N ₁	N ₂		P ₀	P ₁	P ₂		K ₀	K ₁	K ₂	Mean
G ₁	51.7	54.6	52.8	G ₁	51.9	52.5	54.7	G ₁	52.2	53.6	53.3	53.0
G ₂	51.5	54.3	58.1	G ₂	51.4	54.1	53.4	G ₂	51.2	54.2	53.5	53.5
G ₃	46.9	50.2	50.1	G ₃	47.6	48.3	51.3	G ₃	46.6	50.7	49.9	49.1
Mean	50.1	53.0	52.0	Mean	50.3	51.6	53.1	Mean	50.0	52.8	52.2	
P ₀	49.3	51.5	50.2	K ₀	46.7	49.9	51.4	N ₀	49.9	49.5	60.7	50.1
P ₁	50.0	52.8	52.1	K ₁	50.7	52.8	55.0	N ₁	50.3	55.6	53.3	53.0
P ₂	50.8	54.8	53.6	K ₂	51.6	52.2	52.9	N ₂	49.8	53.4	52.7	52.0

Comparison of significant effects

CD (P=0.05) N, P and K 2.103* S 2.103**

hot and moist atmosphere is representative of normal ageing i.e., it is a true time-lapse process (Heydecker 1972). Large seeds recorded more

germination after accelerated ageing than the small ones (Table 1 and 1a). Similar conclusions were arrived by Suryakumar (1980).

Application of 100 kg N/ha recorded higher germination after ageing than the other two levels. Sikder (1965) reported that application of N upto 300 lb/ac improved storability of rice seed. Application of P significantly improved the storability. This could be attributed to the functions of phospholipids such as lecithin, in controlling the properties and permeability of cells and of its organelles and the functions of phytin (Mayer and Mayber, 1975).

Germination after accelerated ageing was perceptibly high in seeds

fertilized with K. In *Capasicum frutescens*, K deficient plants had a lower percentage germination than that from control plants and its viability declined more rapidly in storage than that from normal plants (Harrington, 1960) whereas, seed from moderately potassium deficient plants of *Brassica chinensis* was not inferior to that from normal plants (Iwata and Eguchi, 1958).

Hence, application of 100 kg/ha of N, P and K to the seed crop of CSH 5 will enhance the storability of hybrid seeds.

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