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INFLUENCE OF DATES OF SOWING OF THE PARENTAL LINES OF KM. 2 BAJRA HYBRID ON SEED YIELD AND QUALITY

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Sowings of the parental lines of KM 2 hybrid bajra at monthly intervals from October 1980 to March 1981, revealed that (i) the lines flowered seven days ahead when sown in October than in other months: (ii) number of productive tillers and hybrid seed yield were high from the November sown crop; and (iii) hybrid seed obtained from October, November and December sowings exhibited significantly better vigour than from other months.

Seed producers and seed growers in Tamil Nadu particularly in Coimbatore district are taking up sowing of the parental lines during the period from December to February for hybrid bajra seed production, while the commercial crop is being raised in three distinct seasons namely March-April, June-July and September-October. In general, the hybrid seed yields are low which may be due to the winter season in which the crop is besides the poor seed production agronomy. Hence it is evident that season of production largely influence both yield and quality seed. With this in view studies were conducted to elucidate information on the influence of dates of sowing of the parental lines on the yield and quality of KM 2 hybrid bajra seed.

MATERIAL AND METHODS

The male (K . 560, D.230) and female (MS. 5141A) lines of KM 2 hybrid bajra were sown simultaneously at monthly intervals starting from October 1980 to March 1381. An area of 50.4 sq.m. was marked every month and divided into four equal portions of 3.15 m each to serve as an individual plot. In each plot, one replication was accomodated. Each replication consisted of five rows of female line and one row of male line as border row. Recommended package of practices were adopted for all the months of sowing.

Ten plants in each replication were marked randomly for recording the following, observations, viz ., (i) number of days to 50 per cent flowering, (ii) height of plant at maturity, (iii) number of total and productive tillers per plant at maturity. (iv) length and diameter of peducncle and (v) length and diameter of earhead of the primary tiller.

The crop was harvested on the 90 th day after sowing when the seed moisture content was around 25 per cent. The earheads were dried till the moisture content came down to 15 per cent, Then the earheads were threshed and the seeds were cleaned, dried to uniform moisture content of 10-11 per cent and weighed. The seed yield of the plots was computed to hectare and expressed in kilograms.

The bulk seed obtained from different plots was graded using 5/64" and 4/64" round perforated metal sieves. The seeds retained in the above two sieves and that passed through 4/64" sieve were designated as G_1, G_2 and G_3, respectively and their weight recorded to work out the percentage recovery on weight basis to the total.

The graded seeds from each replication were pooled gradewise and mixed thoroughly and samples were drawn for conducting the following tests/observations viz., (i) thousand seed weight, (ii) germination percentage (ISTA, 1976), (iii) dry matter production and (iv) vigour index (Abdul-Baki and Anderson, 1973).

RESULTS AND DISCUSSION

The influence of the climatic factors on flowering has been amply demonstrated in many crops (Kunjamma and Meenakshi, 1976). In the presnt study, the number of days to flowering was significantly influenced by dates of sowing (Table 1). The flowering was earlier by 6.8 days in March than in October sowing, when high temperature and relative humidity prevailed. The temperature and relative humidity during October and March was 26.3°C and 76.3 per cent and 27.2°C and 55.3 per cent, respectively. Hellmers and Burton (1972) recorded early flowering under high temperature conditions.

The influence of dates of sowing on plant height was not significant. Koli (1975) has recorded similar results. However, the height was maximum in March sown crop when the number of tillers was minimum. Burton (1965) arrived at similar conclusion. The reason might be the production of less number of side tillers in summer months ultimately resulting in increased plant height. Begg and Burton (1971) reported a negative relationship between height of plant and the number of tillers

The number of productive tillers differed significantly due to dates of sowing. Tomer *et al.* (1976) reported that productive tillers differed significantly among dates of sowing. November and March sown crops recorded the maximum (6.7) and minimum (4.3) number of productive tillers. Number of tillers increased with decrease in temperature. According to Begg and Burton (1971), plant grown under winter temperature tillered more than similar plants grown under summer temperature. The high photosynthetic efficiency under winter temperature may be the cause for more tillering. According to Mitchell (1953), high temperature decreased the energy available to the plants and thereby reduced their rate of tillering.

Hybrid seed yield differed significantly due to dates of sowing. Pal (1973) reported significant variation in seed yield due to dates of sowing and the major contribution to yield was through the number of productive tillers per plant (Koli, 1975). November and March sown crops recorded the highest (2037 kg/ha) and the lowest (1613 kg/ha) seed yields when the number of productive tillers was maxi-

mum and minimum, respectively. The highest seed yield in November sowing might be due to a better redistribution of metabolites between the vegetative and reproductive organs under the influence of low temperature. Low temperature during flowering increased the seed set and yield of barley (Tingle *et al.*, 1970); while high temperature increased the respiration and decreased the photosynthetic activity (Murata, 1964).

The recovery of seeds in different size grades and their thousand seed weight did not very significantly due to dates of sowing (Table 2). The probable cause for this might be the timely harvesting and processing of seed with minimum injury.

The germination percentage and vigour index did not vary significantly due to dates of sowing (Table 2). Seedlings raised from the seeds harvested from October to December sown crops were heavier and those from January to March lighter in weight. Palaniswamy (1979) observed significant influence of sowing on dry matter production.

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Table 1. Influence of dates of sowing on growth and seed yield of inbred MS. 5141A

	No of days to 50% flowering	Height of plant (cm)	No of productive tillers/ plant	Peduncle		Earhead		Seed yield (kg/ha)
				Length (cm)	Diameter (cm)	Length (cm)	Diameter (cm)	
1980								
October	58.5	84.9	6.5	24.3	0.40	15.8	1 66	2030
November	56.9	81.6	6.7	24 9	0.40	15.8	1.63	2037
Decemher	56.4	78.4	5.4	24.5	0.39	15.0	1.62	2007
1981								
January	55.3	89.3	5.7	25 5	0.40	16.9	1.65	1876
February	52 8	89.0	5.0	25.0	0.40	17.3	1 68	1709
March	51.7	50.7	4 3	24.7	0.39	17.6	1 69	613
SEd	0.97	—	0.68	—	—	—	—	113
CD	2.12**	NS	1.48*	NS	NS	NS	NS	246**

Table 2. Influence of date of sowing on seed characters of KM. 2 hybrid seed.

	1980			1981			Mean
	October	November	December	January	February	March	
Recovery (%)							
G_1	63.9	63.5	63.9	62.2	62.7	63.7	
G_2	34.1	34.5	33.8	35.9	35.4	34.2	
G_3	2.0	2.0	3.3	1.9	1.9	2.1	
1000 seed weight (g)							
G_1	7.39	7.37	7.42	7.48	7.52	7.43	7.44
G_2	4.65	4.48	4.51	4.57	4.49	4.56	4.55
G_3	2.23	2.26	2.22	2.20	2.26	2.20	2 23
Mean	4.76	4.70	4.72	4.75	4.76	4.73	4.74
Germination (%)							
G_1	95.5	96.7	95.8	95.7	95.3	96.1	95 9
G_2	91.7	93.3	91.8	91.5	92.1	92.0	92.1
G_3	72.9	72.1	72.7	72.3	72.3	72.9	72 5
Mean	86.7	87.4	86 8	86.5	86.6	87 0	86.8
Dry matter production (mg)							
G_1	84	84	85	81	80	79	82
G_2	52	50	51	48	49	48	49
G_3	22	22	21	19	19	19	20
Mean	53	52	52	49	49	49	50
Vigour Index							
G_1	3100	3123	3104	3091	3080	3146	3124
G_2	2465	2481	2492	2417	2420	2537	2468
G_3	1390	1351	1381	1403	1363	1486	1395
Mean	2318	2318	2326	2303	2288	2390	2329

	CDM	CDG	CD Mx G
Recovery percentage	NS	17.86**	NS
Thousand seed weight	NS	0.156**	NS
Germination	NS	2 02**	NS
Dry Matter production	2.49**	1 76**	NS
Vigour iudex	NS	223**	NS