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QUALITY OF KM. 2 HYBRID BAJRA SEED IN DIFFERENT TILLERS OF A PLANT*

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Investigations carried out to study the differences in quality of seed in different tillers of a plant revealed that the length, diameter and weight of earhead and yield of hybrid seed decreased significantly with the lateness of tillering in a plant. The recovery of large size seed was high from the primary tiller and low in the subsequent tiller. Weight, protein content, germination and vigour was significantly more in the seed from the primary tiller than from other tillers.

In bajra, tillers formed at different places in a plant and at different times be subjected to different conditions of external environment influencing the initiation, growth and development and maturation of seed (Ovcharov, 1969) Therefore, the location of seed formation on the plant creates heterogeneity in the quality of seed, not only because such seeds are formed in slightly different kinds of external environment but also because they have different supply of nutritional matter and other substances essential for life (Ovcharov and Kizilova, 1966) and is an important factor in determining the seed size and weight. Seed weight in turn has a significant influence on germination and seedling vigour within species (McKell, 1972). Information on this aspect will be of great use to adopt management practices in order to restrict the tillering of the mother plant by adopting suitable spacing of plants with that the seeds obtained from the resultant crop are of uniform quality.

MATERIALS AND METHODS

Ten plants were selected at random from a bajra KM. 2 hybrid seed production plot raised during June, 1980. In each plant, as and when the tillers formed are serially numbered and designated as T_1, T_2, T_3, T_4, T_5, T_6 and T_7.

At maturity, the earheads from each tiller were separately harvestep and their length, diameter and weigh recorded. Then, they were threshed and the seeds dried to 10-11 per cent moisture content. After cleaning, the weight of seeds per earhead was recorded and expressed in g.

The seeds were pooled tillerwise and size graded using 5/64" and 4/64" round perforated metal sieves and the percentage recovery in each size grade was worked out on weight, basis. The seeds retained in the above sieves were designated as G_1 and G_2, respectively and that passed through 4/64" as G_3. With the samples drawn, the

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following testsestimations viz., thousand seed weight, germination percenta e, root and shoot length of the seedling and protein content were carried out.

RESULTS AND DISCUSSION

Highly significant variation in length, diameter and weight of earhead was observed among tillers of a plant and the values decreased correspondingly with the lateness of the tiller formation. (Table 1). The primary tiller (T_1) recorded the maximum. length, diameter and weight of earhead and T_7 the minimum. Ayyangar and Hariharan (1935) reported that the size and weight of earhead showed a progressive decline with the lateness of tillering. This variation may be mainly due to competition between and within plants for light, water and nutrients.

A progressive decline in the size and weight of seed was evident with the lateness of earhead formation. T_1 recorded significantly more weight than other tillers. The recovery of G_1 seed was maximum in T_1 and minimum in T_6. The recovery of G_2 was maximum in T_8 and minimum in T_1. T_7 recorded the maximum and T_2 the minimum recovery of G_2 seeds (Table 2). Ayyangar and Hariharan (1935) and Sankaran *et al.*, (1967) in bajra and Stron a (1964) in wheat reported reduction in the size and weight of seed with the lateness of tillering. In wheat, the differences were related to the sequenc of anthesis and maturation of florets (Hardesty and Elliot, 1956). Therefore the location of seed formation on the plant has a great influence on sowing quality and is an important factor in determining seed weight (Strona, 1964). The thousand seed weight in T_1 was higher than in other tillers. T_7 recorded the minimum. Seed weight in turn has a significant influence on germination and seedling vigour (McKell, 1972). Seed from T_1 recorded the highest germination, while those from T_7 the lowest. Seed from T_1 produced seedling with longest root nd shoot, while that from T_7 the hortest. Differences in seed germination and seedling vigour between arheads of a plant in bajra (Ayyangar nd Hariharan, 1935; Sankaran *et al.*, 967); between different regions of a vheat spike (Hardesty and Eilliot. 1956) r a maize cob (Ivaneh, 1963), and lifferent parts of a cotton plant (Nairov, 1958), or carrot plant (Hawthorn *t al.*, 1962) or cabbage plant (Makaov and Kondrateva, 1962) have been eported. Bio-chemical variability is requently observed in fully matured seed formed in different parts of the generative organs (Ovcharov, 1969). Hardesty and Elliot (1956) observed that the first seed in a developmental sequence may have a competitive advantages over the later formed seeds in the sequence. In the present study, the seed protein content differed significantly among tillers of a plant. Seed from T_1 recorded the highest protein content and T_7 the lowest (Table 3). Rechnik (1962) have reported significant variation in protein content in wheat seed of different spikes and in the seed within the limits of spikelets and spikes. The results also revealed that the portein content increased significantly with increase in seed size and weight.

Table 1. Length, diameter and weight of earhead and weight of seeds per earhead in the inbred MS 5141 A among tillers in a plant.

Tiller	Earhead			Weight of seeds per earhead (g)
	Length (cm)	Diameter (cm)	Weight (g)	
T_1	17.78	1.63	15.69	12.17
T_2	17.78	1.51	13.36	9.55
T_3	17.39	1.41	12.16	8.52
T_4	15.45	1.36	10.15	7.35
T_5	15.33	1.31	9.34	6.78
T_6	13.93	1.16	5.48	3.27
T_7	12.01	1.06	3.39	1.52
CD (P - 0.05)	1.60**	0.09**	2.59**	2.24**

Table 2. Recovery percentage, thousand seed weight and germination of size grades of KM. 2 hybrid seed among tillers of a plant.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
Recovery percentage								
i_1	73.7	60 6	45.3	45.1	38,9	12.2	—	—
i_2	26.3	38.5	52.7	52.6	58 2	79.6	—	—
i_3	—	0.9	2 0	2.3	2.9	8.2	100	—
Thousand seed weight (g)								
i_1	7.44	7.14	6.99	6.68	6.60	5.76	—	6 77
i_2	5.51	5.27	5.26	4.75	4.74	4.67	—	5.03
i_3	—	2.68	2.64	2.45	2.35	1.90	1 88	2.32
Mean	6.48	5.03	4.96	4.63	4.56	4.11	1.88	4.71
Germination (%)								
i_1	98	100	98	99	97	95	—	98
i_2	98	97	97	97	94	95	—	96
i_3	—	88	87	88	87	85	80	86
Mean	98	95	94	95	93	92	80	93

	Recovery percentage CD (P=0.05)	Thousand seed weight CD (P=0 05)	Germination CD (P=0.05)
T_1 Vs T_2 to T_6		0.61	3
T_1 Vs T_7		0.73	4
T_2 Vs T_3 to T_6		0.48	3
T_2 to T_6 Vs T_7		0.69	4
G	1.79	0.34	2
T x G	4.39	0.84	NS

Table 3. Root and shoot length of seedling and protein content of size grades of KM. 2 hybrid seed among tillers of a plant.

	T_1	T_2	T_3	T_4	T_5	T_6	T_7	Mean
Root length(cm)								
G_1	23.7	22.5	22.6	22.0	21.4	19 8	—	22.0
G_2	19.4	19 0	18.6	18 3	18.1	17.4	—	18.4
G_3	—	13.8	13.4	13.5	12 7	12 4	11.8	12.9
Mean	21.6	18 4	18.2	17.9	17.4	16 5	11.8	17.8
Shoot length(cm)								
G_1	12.7	11.8	11.4	10.9	10.6	10.1	—	11.3
G_2	11.8	11.6	11.1	10.4	10 2	10.2	—	10.9
G_3	—	9.0	8.6	8.4	8.2	7.9	7.4	8.2
Mean	12.3	10.8	10.4	9.9	9.7	9.4	7.4	10.1
Protein content(%								
G_1	11.5	11.2	11.3	11 0	10.8	10.4	—	11.0
G_2	10.2	10.2	10.0	9.8	9 6	9.3	—	9.9
G_3	—	9.0	8.8	8 8	8.7	8.2	8.0	8.6
Mean	10 9	10.1	10.0	9 9	9.7	9.3	8 0	9 8

	Root length (P=0.05)	Shoot length (P=0 05)	Protein content (P=0.05)
T_1 Vs T_2 to T_6	2.1	0.4	0 5
T_1 Vs T_7	2.9	0.5	2.0
T_2 Vs T_3 to T_6	1.9	0 4	0.5
T_2 to T_6 Vs T_7	2.7	0.5	1.2
G	1.4	0.3	1.0
T x G	NS	NS	NS

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