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EFFECT OF DIFFERENT DATES OF SOWING ON POLLEN VIABILITY IN PARENTAL LINES OF SORGHUM HYBRIDS

N.B. Mehetre*[1], Ashwini V. Jadhav[1] and D.B. Mehetre[2]
[1]Department of Botany, Samarth Agriculture college, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, (M.S) India.
[2]Department of Agronomy, Samarth Agriculture college, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S) India.
*Corresponding Author: nitinmehetre29@gmail.com, 0 9423731081

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ABSTRACT

A field experiment was conducted to study the effect of different dates of sowing on Pollen viability in parental lines of sorghum hybrids during Kharif season. Pollen viability was studied for restorer (R) lines AKR-150, C-43, ICSR-89058 & AKR-73 of sorghum hybrids at three different sowing dates. In all sowing dates pollen viability of seed parent AKR-150 was viable up to 6 hrs and highest at 8 am in D1. Seed setting was highest at 8 am for seed parent AKR-150, ICSR-89058 and AKR-73 except C-43 where highest seed setting at 9 a.m.

***Keywords*:** AKR-150, C-43, ICSR-89058, AKR-73 & pollen viability.

INTRODUCTION

Sorghum is the 5th major cereal crop in the agriculture scenario of the globe. Improper nicking of male sterile lines & restorer of hybrids is one of the reasons for low seed yield of released hybrids. Hence improved seed production technology will help to improve the present low level of seed yield & spread of hybrids for better seed production of hybrids. For better seed production of hybrids, it is essential that the male sterile (A) lines & restorer (R) Should synchronize in flowering Delayed or early flowering of any present adversely affects the seed setting. Among the released hybrids serious synchronization problem is often observed with the hybrid seed production of CSH-5 & CSH-9 (Singh & Nayeem, 1980). Pollen viability studies are important for understanding the pollen sterility problems in crop plants and experimental work of hybridization. With the pollen viability studies proper time for pollination can be find out during hybridization programme. Synchronization, stigma receptivity & pollen viability which are bottle neck in the hybrid seed production of sorghum, the studies were undertaken in the parents of newly evolved sorghum hybrids like CSH-14, CSH-16, SPH-840 & SPH-388 during karif to see performance of these hybrids for determining the pollen viability of 'R' lines.

MATERIALS AND METHODS

The experiment was laid out in the field during kharif. There planting dates & eight genotypes were studied in factorial randomized block design with three replication. Sorghum hybrids CSH-14, CSH-16, SPH-840 & SPH-388 are sown at three different dates D1 (25th June), D2 (1st July), & D3 (7th July) in plot size of 4m X 2.7m area with three replication. The row to row spacing was 45 cm & plant to plant 15 cm. All the cultural practices were followed as per the recommended package of practices for sorghum.

OBSERVATIONS

Five plants were randomly selected from middle of each genotype in all the sowing dates for recording observations.

Pollen Viability studies: Four restore 'R' lines AKR-150, C-43, ICSR-89058 & AKR-73 by sowing the genotypes. By giving one hour storage period interval to the pollens of restorers (R) lines the male sterile (A) lines were pollinated from 8.00 am to 1.00 pm.

Statistical Analysis: Results were analyzed from randomized block design (factorial) by standard statistical Procedure (Panse & Sukhartme, 1981).

RESULTS & DISCUSSION

Pollen viability studies in parental lines of newly evolved Sorghum hybrids were conducted by planting parental lines of CSH-14, CSH-16, SPH-840 & SPH-388. Three rows of restorer lines were planted in replicated trial on three different sowing dates & observation were recorded on pollen viability of restore lines were studied.

It was observed that in D1 sowing date pollen viability of seed parent AKR-150 was viable up to 6 hours & viability was highest at 8.00 am where as in D2 & D3 viability was up to 5 hours for seed parents AKR-150, C-43, ICSR-8905 & AKR-73 seed setting was highest at 8.00 am for seed parents AKR-150, ICSR-8905 & AKR-73 except C-43. Seed parent C-43 shows highest seed setting at 9.00 am. In general pollen viability was satisfactory up to 11.00 am (3 hours storage) under field condition in Kharif. These results are corroborates with the findings of Singh *et al.*, 1985 &

Anonymous 1999-2000b. Early planting of seed crop & staggered sowing of early parent in kharif season under vidharbha condition should be adopted to reduce synchronization problems. Variation due to storage of pollens, genotypes & interaction was statistically significant in D1, D2 & D3 sowing dates. Pollen viability studies was conducted on restores (R) lines & judge by seed setting percentage on their respective seed parent in D1, D2 & D3 sowing data pollen viability was maximum in D1 (52.86%) &maximum in D3(46.49%) at 8.00 a.m. (0 hour storage) & percentage was better up to 10 A. M. (2 hours) storage in all sowing dates. Pollen parent AKR-150 exhibited highest (52.86%) pollen viability followed by ICSR-8958(52.36%) in D1& C-43 exhibited west (46.49%) pollen viability in D3 sowing date (Table 1,2,3).

Table 1: Performance of Restorer (R) lines for pollen viability studies in D1 sowing dates.

Genotypes (F2)	**Starvation Period in days (F1)**						**Mean**
	8.00	9.00	10.00	11.00	12.00	1.00	
AKR-150	86.98	82.80	70.25	52.12	18.70	6.36	52.86
C-43	60.00	91.65	80.70	46.00	25.27	0.00	50.60
ICSR-89058	85.57	73.36	67.30	55.53	30.35	0.00	52.36
AKR-73	84.29	71.63	61.21	46.46	24.50	0.00	48.01
Mean	87.53	77.47	64.45	47.28	19.90	4.64	
	F test			SE (m) ±		CD at 5 %	
Sowing date(F1)	Sign.			0.88		1.77	
Genotype (F2)	Sign.			0.71		1.44	
Interaction (F1x F2)	Sign.			1.76		3.84	

Table 2: Performance of Restorer(R) lines for pollen viability studies in D2 sowing dates.

Genotypes (F2)	**Starvation Period in days (F1)**						**Mean**
	8.00	9.00	10.00	11.00	12.00	1.00	
AKR-150	87.18	76.29	62.21	41.46	21.23	0.00	48.06
C-43	43.30	88.35	72.58	47.36	30.04	0.00	46.93
ICSR-89058	82.48	77.30	69.19	50.56	25.40	0.00	50.82
AKR-73	83.30	65.16	65.80	52.43	28.19	0.00	49.14
Mean	74.06	76.77	67.44	47.95	26.21	0.00	
	F test			SE (m)±		CD at 5 %	
Sowing date(F1)	Sign.			0.71		1.43	
Genotype (F2)	Sign.			0.58		1.17	
Interaction (F1x F2)	Sign.			1.42		2.87	

Table 3: Performance of Restorer(R) lines for pollen viability studies in D3 sowing dates.

Genotypes (F2)	**Starvation Period in days (F1)**						**Mean**
	8.00	9.00	10.00	11.00	12.00	1.00	
AKR-150	89.47	80.50	65.13	48.40	16.56	0.00	50.01
C-43	37.66	88.14	81.56	50.30	21.29	0.00	46.49
ICSR-89058	82.28	70.14	62.30	41.31	25.10	0.00	46.85
AKR-73	85.40	78.28	65.73	45.56	23.26	0.00	49.70
Mean	73.70	79.26	68.68	46.39	21.55	0.00	
	F test			SE (m) ±		CD at5 %	
Sowing date(F1)	Sign.			1.01		2.03	
Genotype (F2)	Sign.			0.82		1.66	
Interaction (F1x F2)	Sign.			2.02		4.07	

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