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Research Note

Correlation studies for yield and its component traits in newly derived lines of *kharif* sorghum

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Abstract
Twenty six derived lines (named as AKENT number) along with resistant line (IS 18551), two susceptible lines (AKMS-14 B, DJ-6514) of kharif sorghum were evaluated for yield and yield components. Correlation studies revealed that the character grain yield per plant showed positive and significant association with days to 50 per cent flowering, plant height, 1000 seed weight and fodder yield. Thus for the development of high yielding varieties in sorghum, days to 50 per cent flowering, plant height, 1000 seed weight and fodder yield per plant should be considered during selection.

Key words
Sorghum, Genotypic correlation, Fodder yield, Grain yield

Sorghum is one of the important cereal crops of world. This crop is better adapted to drought prone regions with poor soils when compared to other cereals. In India this crop in mostly grown in Maharashtra, Karnataka, Andhra Pradesh, Madhya Pradesh, Rajasthan, Uttar Pradesh, Gujarat and Tamil Nadu. For increasing the yield potential of kharif sorghum there is need to identify the characters associated with the grain yield. The intensity of association of characters is determined by correlation studies. Such correlation studies help us to know which character should be chosen for selection to bring about the maximum increase in the ultimate product. So, investigation was carried out to assess the nature and the extent of correlation between yield and the yield contributing characters in kharif sorghum.

Twenty six derived lines (named as AKENT number) were selected to study the variability for yield and yield components. These lines have been derived from backcross breeding, screening for (F_1) first filial generation. The current study was conducted with involvement of at least one resistant parent in their crossing programme and these lines are supposed to be with resistant blood for shoot fly reaction. In addition to these 26 lines, one resistant line (IS 18551), two susceptible lines (AKMS-14 B, DJ-6514) were used in the present study. Name of the entries along with their pedigree given in (Table 1) Most of the entries were having good agronomic background. The experiment was sown at Sorghum Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (MS) during *kharif* 2013. Material was sown in randomized block design. Observations were recorded on six characters like days to 50 per cent flowering, plant height (cm), panicle breadth (cm), 1000- seed weight (g), fodder yield per plant (g) and Grain yield per plant (kg). Genotypic correlation coefficients were worked out as per the formulae suggested by Dewey and Lu (1959).

The results presented in table 1 showed that the character, grain yield per plant showed positive and significant association with days to 50 per cent flowering, plant height, 1000- seed weight and fodder yield per plant. None of the characters showed negative and significant correlation with grain yield per plant.

Grain yield per plant was positive and significantly correlated with days to 50 per cent flowering. This finding stood parallel with findings of Seetharam and Ganesh murthy (2013). Mahajan *et al*. (2011) reported positive significant correlation between grain yield per plant with plant height. The character, 1000- seed weight exhibited positive and significant correlation with grain yield per plant and this result was in conformity with the results of Hemlata et al. (2006) and Premlatha et al. (2006). Thus selection for days to 50 per cent flowering, plant height, 1000- seed weight and fodder yield per plant will be helpful for simultaneous improvement of grain yield per plant.

Among the component characters, the character *viz.* days to 50 per cent flowering showed significant and positive association with plant height, 1000- seed weight and fodder yield per plant. Seetharam and Ganesh murthy (2013) reported positive correlation between days to 50 per cent flowering and plant height. Positive significant association between days to 50% flowering and fodder yield per plant was also obtained by Godbharle et al. (2010). Thus selection for days to 50 per cent flowering will be helpful for

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simultaneous improvement of plant height, 1000-seed weight and fodder yield per plant.

Plant height exhibited positive and highly significant correlation with 1000- seed weight and fodder yield per plant. Jain et al. (2009) observed similar correlation between plant height with fodder yield and number of leaves. Thus selection for plant height will be helpful in simultaneous improvement of fodder yield per plant and it can be very well exploited for development of high fodder yielding varieties in sorghum. Mahajan et al. (2011) reported the positive association between plant height and 1000 seed weight.

Panicle breadth did not show positive and significant correlation with any of the characters but showed positive and non-significant correlation with 1000- seed weight there by indicating that selection for more panicle breadth may be helpful in increasing the 1000 seed weight.

1000- seed weight exhibited positive and highly significant association with fodder yield per plant thereby indicating that bold seeded entries may tend to give higher fodder yield. Mahajan et al. (2011) reported the positive association between 1000- seed weight and fodder yield.

Thus, it was concluded form the present study that days to 50 % flowering, plant height, 1000- seed weight and fodder yield per plant exhibited positive and highly significant association with grain yield per plant. So, for the development of high yielding varieties in sorghum, days to 50 per cent flowering, plant height, 1000- seed weight and fodder yield per plant should be considered during selection.

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Table 1: List of Genotypes along with their pedigree

S.NO	LINES	PEDIGREE
1.	AKENT 101	09RSF -23 -5
2.	AKENT 102	09RSF -23.5-1
3.	AKENT 103	09RSF -24 -11.3
4.	AKENT 104	09RSF -24 -11-2-1
5.	AKENT 105	09RSF -25
6.	AKENT 106	09RSF 25 – 8
7.	AKENT 107	09RSF 26 – 4
8.	AKENT 108	09RSF 27 – 10
9.	AKENT 109	CI .12 × I.25017 - 26.1
10.	AKENT 110	CI .12 × I.25017 - 29.5
11.	AKENT 111	CI .12 × I.25017 - 35.2
12.	AKENT 112	RS.29 × I.25017 1-1-1
13.	AKENT 113	RS.29 × I.25017
14.	AKENT 114	RS.29 × I.25017 9-1-1
15.	AKENT 115	RS.29 × I.25017 15
16.	AKENT 116	RS.29 × I.25017 18-2-1
17.	AKENT 117	RS.29 × I.25017 .21
18.	AKENT 118	RS.29 × I.25017 .22
19.	AKENT 119	RS.29 × I.25017 .26
20.	AKENT 120	APK.1 × Ind - 12.13
21.	AKENT 121	APK.1 × Ind - 12-13.1
22.	AKENT 122	APK.1 × Ind -12.15
23.	AKENT 123	DSV.6 × Somopure local -1
24.	AKENT 124	IS. 73210 ×Spv .1428 × I.12 – 13
25.	AKENT 125	IS. 73210 ×Spv .1428 × I.12 – 15
26.	AKENT 126	IS. 73210 ×Spv .1428 × I.12 – 27
27.	AKMS-14B(S)	Male sterile line of hybrid CSH-14 and known susceptible line for shoot fly
28.	DJ-6514(S)	Released variety from Dharwad center and susceptible line for shoot fly
29.	IS-18551(R)	International sorghum germplasm line and resistant line to shoot fly

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Table 2: Analysis of variance for yield and yield contributing characte

SI. No.	Characters	Mean Sum of Squares		
		Replications	Genotypes	Error
1	Days to 50% flowering	13.45	131.18**	29.95
2	Plant height (cm)	50.94	593.38**	51.24
3	Panicle Breadth (cm)	0.150	1.33*	0.324
4	1000- seed weight (g)	15.61	257.12**	9.69
5	Fodder yield/plant (g)	42.28	2343.59**	31.35
6	Grain yield/plant (g)	2.061	147.7**	9.04

Note: * Significant at 5% level of significance
* * Significant at 1% level of significanc

Table 3- Genotypic correlation coefficients between grain yield and yield contributing character

Characters		Plant height	Panicle Breadth	1000- seed weight	Fodder yield/plant	Grain yield/plant
Days to 50% flowering	G	0.439	0.001	0.379*	0.730**	0.719**
Plant height (cm)	G		0.032	0.359*	0.798**	0.399*
Panicle Breadth (cm)	G			0.09	-0.237	-0.179
1000- seed weight (g)	G				0.452**	0.430*
Fodder yield/plant (g)	G					0.576**

G- Genotypic correlation coefficient, *Significant at 5% ** Significant at 1%