IJPS INTERNATIONAL JOURNAL OF PLANT SCIENCES
Volume 9 | Issue 1 | January, 2014 | 199-201

RESEARCH ARTICLE

Effect of planting ratios on seed quality parameters of sorghum hybrid cv. SHD-9704 [*Sorghum bicolor* (L.) Moench]

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SUMMARY

The present investigation was carried out in the Department of Seed Science and Technology, College of Agriculture, University of Agricultural Sciences, Dharwad during *Rabi* season in 2007and *Kharif* season in 2008 and their pooled data on effect of planting ratios on seed quality parameters of sorghum hybrid cv-SHD-9704 (*Sorghum bicolor*). The seed quality parameters like germination percentage, root length, shoot length, seedling vigour index, and seedling dry weight did not exhibit marked variations due to planting ratios (P). The 100 seed weight varied significantly due to planting ratios (P).Significantly more 100 seed weight was recorded in 4:2 planting ratios (P_1) (2.71 g) over 6:2 planting ratio (P_2) (2.36 g).

Key Words : Sorghum, Planting ratio, 100 seed weight, Germination, Root length, Shoot length, Seedling dry weight, Seedling vigour index

How to cite this article : Sharnkumar and Merwade (2014). Effect of planting ratios on seed quality parameters of sorghum hybrid cv. SHD-9704 [*Sorghum bicolor* (L.) Moench]. *Internat. J. Plant Sci.*, **9** (1): 199-201.

Article chronicle : Received : 22.10.2013; **Revised :** 10.11.2013; **Accepted :** 20.11.2013

Sorghum [*Sorghum bicolor* (L.) Moench] commonly known as 'jowar', is the fifth most important cereal crop in the world next to wheat, rice, maize and barley. It is cultivated on about 7.93 million hectare area with annual production of 7.78 million tonnes and productivity of 981 kg per ha (Anonymous, 2008). The major sorghum growing states in India are Maharashtra, Karnataka, Andhra Pradesh, Madhya Pradesh, Rajasthan and Tamilnadu. In India, Karnataka state is one of the important sorghum growing states and stands second in area and production after Maharashtra. In Karnataka, it accounts for 1.38 million hectare area and production of 1.62 million tonnes with average productivity of 1192 kg per ha (Anonymous, 2009). Borikar *et al*. (1984) reported that seed germination was not affected by planting ratio treatments. Patil and Bharud (1991) reported that planting ratio did not influence the seed germination significantly. In an investigation carried out by Prasad (2006) at two successive years where parental lines, MS-2219 A and PC 23 R were employed in five planting ratio of female and male (4:2, 6:2, 8:2, 10:2 and 12.2). The results revealed that the planting ratio did not influence seed vigour and was non significant in all seed vigour tests.

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MATERIAL AND METHODS

The laboratory experiments were conducted during 2007 (*Rabi*) and 2008 (*Kharif*) to study the effect of planting ratios on seed quality attributes in pre-released sorghum hybrid SHD-9704 in the Department of Seed Science and Technology, College of Agriculture, University of Agricultural Sciences, Dharwad.

The observations were made on 100 seed weight (g), germination (%), root length(cm), shoot length (cm), seedling dry weight (mg) and seedling vigour index. The data obtained from various periodical observations were subjected to

Table 1 : Effect of planting ratios on 100 seed weight (g), germination (%), root length(cm), shoot length (cm) of sorghum hybrid cv. SHD-9704

Treatments	100 Seed weight(g)						Germination (%)					
	Rabi 2007-08		*Kharif* 2008-09		Pooled data		*Rabi* 2007-08		*Kharif* 2008-09		Pooled data	
P1	2.79		2.64		2.71		88.75(70.42)*		85.96(67.98)*		87.35(69.15)*	
P2	2.41		2.30		2.36		86.42(68.38)*		83.75(66.21)*		85.08(67.26)*	
Mean	2.60		2.48		2.54		87.58(69.38)*		84.85(67.07)*		86.22(68.19)*	
	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)
P	0.02	0.06	0.02	0.06	0.02	0.06	1.03	NS	0.76	NS	0.89	NS

Table 1 contd....

Root length(cm)						Shoot length (cm)					
Rabi 2007-08		*Kharif* 2008-09		Pooled data		*Rabi* 2007-08		*Kharif* 2008-09		Pooled data	
14.34		13.69		14.02		16.97		16.31		16.64	
14.01		13.29		13.65		16.51		15.86		16.18	
14.18		13.49		13.83		16.74		16.08		16.41	
S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)
0.29	NS	0.24	NS	0.24	NS	0.14	NS	0.05	NS	0.09	NS

NS – Non significant
* Figures in the parenthesis are arcsine transformed values
Planting ratios (P)
P_1 – 4:2 (Female : Male)
P_2 – 6:2 (Female : Male)

Table 2 : Effect of planting ratios on Seedling dry weight (mg) and seedling vigour index of sorghum hybrid cv. SHD-9704

Treatments	Seedling dry weight (mg)						Seedling vigour index					
	Rabi 2007-08		*Kharif* 2008-09		Pooled data		*Rabi* 2007-08		*Kharif* 2008-09		Pooled data	
P_1	302.23		288.23		295.23		2781		2594		2688	
P_2	295.33		279.88		287.60		2671		2490		2580	
Mean	298.78		284.05		291.42		2726		2542		2634	
	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)	S.E.±	C.D. (P=0.05)
P	2.08	NS	3.53	NS	1.71	NS	27	NS	23	NS	24	NS

NS=Non-significant
Planting ratios (P)
P_1 – 4:2 (Female : Male)
P_2 – 6:2 (Female : Male)

statistical analysis. The analysis of variance and interpretation of data were done as per procedure given by Gomez and Gomez (1984). The experimental data of 2007 (*Rabi*) and 2008 (*Kharif*) were used for combined analysis to arrive best treatment combination effect. The germination percentages were converted into angular transformation values and then subjected to the statistical analysis.

RESULTS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

Seed quality parameters:

The seed quality parameters like germination percentage, root length, shoot length, seedling vigour index, and seedling dry weight did not exhibit marked variations due to planting ratios (P).

In the present study, all the seed quality parameters *viz.*, 100 seed weight, germination percentage, vigour parameters etc. were relatively more in 4:2 planting ratio than 6:2 planting ratio in both years of experiment as well as combined season analysis. The consistently higher 100 seed weight (2.71 g) , germination percentage (87.35%), root length (14.02 cm), shoot length (16.64 cm) (Table 1), seedling vigour index (2688) and seedling dry weight (295.23 mg) (Table 2) were seen in 4:2 ratio (P_1) than 6:2 planting ratio (P_2) (2.36 g, 85.08%, 13.65 cm, 16.18 cm, 2580, 287.60 mg, respectively.

These findings are corroborative with findings of Borikar *et al*. (1984), Patil and Bharud (1991), Veeranagoudar (1999) and Prasad (2006) in sorghum.

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