Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 3067-3068
Received: 22-05-2019
Accepted: 24-06-2019

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Response of different sowing intervals on growth and yield of Kharif Sorghum genotypes

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Abstract
The experiment was conducted at AICRP (Sorghum), KVK, Chamarajanagar, Karnataka. During *kharif* seasons of 2017-18 and 2018-19. The experiment consist of three different sowing intervals and four genotypes laid out in split plot design replicated thrice. First fortnight of may sowing among different intervals of sowing and with respect to genotypes CSH-30 recorded the highest grain yield and other growth components.

Keywords: Sowing interval, genotypes, growth, yield

Introduction
Sorghum (*Sorghum bicolor* (L.) Moench is an important stable food crop in the southern and northern Karnataka. It is mainly cultivated in the tropical and subtropical climates, especially in the semi arid tropics. After rice, wheat, maize and barley it is fifth most important cereal crop. In India sorghum is mainly cultivated as rainfed crop. The area under this crop in India is about 5.86 million hectares with an annual production of 4.57 million tonnes with a productivity of 779.6 kg/ha (Anonymous, 2017) [1]. Agriculture is the back bone of Indian economy. In India major area under agriculture is under dryland condition. Dryland agriculture mainly depends on the rainfall received by the area. To utilize the moisture effectively for crop production to get the higher yield. Optimum sowing interval is necessary. By sowing the crop in right time, we can reduce the loss due to the deficit moisture. By considering the above reason research was designed to study the best sowing interval to get the better growth, yield and economic returns of kharif sorghum genotypes.

Material and Methods
A field experiment was conducted during *Kharif* seasons of 2017-18 and 2018-19 to study the effect of different interval of sowing and genotypes on the growth, yield and economics of sorghum at AICRP (Sorghum), KVK, Hardanahalli, Chamarajanagar district, University of Agricultural Sciences, Bengaluru. The experiment was laid out with split plot design and replicated thrice. The Main plot consists of three different interval sowing and subplots four genotypes *viz*., CSH-25, CSH-30, CSV-23 and CSV-27 were sown at spacing 45cm×15cm. The plot size was 4.5m×5m. Recommended dose of fertilizer as 65:40:40 kg NPK per hectare. Thinning, weeding, Other recommended practices were followed. Qualitative and quantitative data were recorded. The various biometric observations, analytical data of plant sample and the computed data were subjected to statistical analysis per the procedures given by (Gomez and Gomez, 1984) [2]. The treatment differences were worked out at five per cent probability level.

Results and discussion
There was a significant difference was recorded with different interval of sowing and different genotypes.

Growth parameters
Plant height (cm)
Highest plant height was observed with first fortnight May sowing in both the years of study (233cm and 242cm respectively) in table 1. Increased in plant height may due to favourable environment and effective utilization of the photosynthates during the flowering stage of the sorghum crop. Similar results were observed with Dehghan (2007) [3] and Saini *et al*. 2018 [4]. Highest plant height was observed with genotype CSV-27 (228cm and 248cm, respectively)

compare to other genotypes in the study during the both years of experimentation. Difference in the heights of genotypes may vary with the genetic makeup of the genotype reported by Panwar *et al*. 2015 [5] and Interaction was found non significant.

Leaf area (cm^2)

Increased in the leaf area were recorded by first fortnight May sowing in the both years of study (4524.0cm^2 and 4137.2 cm^2 respectively) in table 1. Increased in the leaf area of plant may due to the sufficient availability of resources.

CSH-30 among the genotype reported the higher leaf area (4307.3 and 4228.13 cm^2 respectively) during the both years of study. Hybrid CSH-30 have triggered in growth attributes. There was no significant difference between the different interval of sowing and different genotypes.

Days to flowering

Genotypes sown during first fortnight May recorded the early flowering (58days) among the different interval of sowing in table 2. Due to the effective utilization of pre monsoon shower during the April and May month.

Early flowering was reported by the CSH-30(54 and 55 days) genotype compare to the other genotypes. Increase in the growth characters like plant height, number of leaves per plant and sufficient availability of resources during that time. Interaction was found non significant.

Grain yield (kg/ha)

From the two years of study first fortnight recorded the higher grain yield (3952 and 3521 kg/ha respectively) in table 2. Increased in grain yield when the sorghum is sown on first fortnight sowing due to sufficient availability of the moisture by pre monsoon shower, increased in the growth and yield attributing characters like plant height, leaf area, panicle length etc. yield components and grain yield of the hybrid sorghum where influenced by the planting date, hybrid maturity groups and locations were reported by Bandiougou (2012) [6] and Saini *et al*. 2018 [4]. CSH-30 genotypes recorded highest grain yield (4175 and 3709 kg/ha, respectively) during the both year of study. Variation in the yield is attributed by genetic variation with genotypes. Similar results were reported by Panwar *et al*. 2015 [5]. Different interval of sowing and genotypes found non significant with respect to interaction.

Table 1: Effect of different date of sowing and hybrids/variety on sorghum plant height (cm) and leaf area (cm^2)

Treatments	Plant height(cm)		Leaf area(cm^2)	
	2017-18	2018-19	2017-18	2018-19
Main plot (03-different interval of sowing)				
D_1	233	242	4524.0	4137.19
D_2	218	206	4302.0	4023.58
D_3	215	183	3603.5	3654.45
S.Em±	2.61	3.11	44.93	65.83
C.D at 5%	10.54	12.21	181.1	258.49
Subplot (04-different genotypes)				
G_1	207	181	4202.0	4002.16
G_2	210	189	4307.3	4228.13
G_3	226	223	4051.5	3803.17
G_4	245	248	4011.7	3721.17
S.Em±	4.39	5.70	75.73	108.51
C.D	13.14	16.94	226.7	322.40

D_1=first fortnight may sowing, D_2=Second fortnight may sowing and D_3= first night June sowing

G_1 =CSH-25, G_2 =CSH-30 G_1 =CSV-23 G_1 =CSV-27

Table 2: Effect of different date of sowing and hybrids/variety on sorghum days to flowering and grain yield (kg/ha)

Treatments	Days to flowering		Grain yield(kg/ha)	
	2017-18	2018-19	2017-18	2018-19
Main plot(03-different interval of sowing)				
D_1	58	58	3952	3521
D_2	62	61	3897	3424
D_3	64	63	3405	3118
S.Em±	0.15	0.54	65	68
C.D at 5%	0.62	2.10	262	267
Subplot(04-different genotypes)				
G_1	59	58	3911	3511
G_2	54	56	4175	3709
G_3	63	63	3632	3336
G_4	68	67	3289	2862
S.Em±	0.24	0.94	102	106
C.D at 5%	0.73	2.80	306	314

D_1=first fortnight may sowing, D_2=Second fortnight may sowing and D_3= first night june sowing

G_1 =CSH-25, G_2 =CSH-30 G_1 =CSV-23 G_1 =CSV-27

Conclusion

From the results it is concluded that first fortnight May sowing increased the growth and yield of sorghum and with respect to the genotypes CSH-30 out yielded compare to other genotypes in this study and also recorded the early maturity and higher yield.

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