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Economics of the sorghum genotypes at different intervals of sowing

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Abstract
The experiment was carried out at AICRP (Sorghum), KVK, Chamarajanagar district, 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. Increased in grain yield, gross returns, net returns and Benefit : Cost ratio(B:C ratio) in both the year of study was recorded in first fortnight of may sowing among different intervals of sowing and with respect to genotypes CSH-30.

Keywords: Sowing interval, genotypes, net returns, gross returns, B:C ratio

Introduction
Sorghum is mainly cultivated in the tropical and subtropical climates, especially in the semiarid tropics. It is fifth most important cereal crop in the world after rice, wheat, maize and barley. In India sorghum is mainly cultivated as rainfed dryland 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). 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 to study the effect of different interval of sowing and genotypes on the yield and economics of sorghum during *Kharif* seasons of 2017-18 and 2018-19 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 The Main plot consist of three different interval sowing and subplot as 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. Other recommended practices like thinning, weeding, application of pesticide were uniformly followed. Crop was harvested at maturity stage, seed yield per net plot of each treatment was recorded. The various biometric observations, analytical data of plant sample and the computed data were subjected to statistical scrutiny as per the procedures given by (Gomez and Gomez, 1984) [3]. 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

Grain yield (kg/ha)
Higher grain yield (3952 and 3521 kg/ha respectively) was recorded in first fortnight may sowing (table 1). Increased in grain yield when the sorghum is sown on first fortnight sowing of may due to the availability of sufficient moisture by pre monsoon rainfall, results in increase in growth and yield attritubuting characters like plant height, leaf area, panicle length etc. yield components and grain yield of the hybrid sorghum where largely influenced by the date of planting, maturity of hybrids groups and locations of the experimental site were

observed by Bandiougou (2012) [2] and Saini *et al*. 2018 [5]. CSH-30 genotypes reported highest grain yield (4175 and 3709 kg/ha, respectively) during the both year of experiment. Difference in the yield is attritubuted by genetic variation with genotypes. Similar results were noticed by Panwar *et al*. 2015. 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 grain yield (kg/ha) of sorghum and cost of cultivation

Treatments	Grain yield(kg/ha)		Cost of Cultivation	
	2017-18	2018-19	2017-18	2018-19
Main plot(03-different interval of sowing)				
D_1	3952	3521	18180	18180
D_2	3897	3424	18180	18180
D_3	3405	3118	18180	18180
S.Em	65	68	18180	18180
C.D at 5%	262	267	18180	18180
Subplot(04-different genotypes)				
CSH-25	3911	3511	18180	18180
CSH-30	4175	3709	18180	18180
CSV-23	3632	3336	18180	18180
CSV-25	3289	2862	18180	18180
S.Em	102	106		
C.D	306	314		

Table 2: Effect of different date of sowing and hybrids/variety of sorghum on Gross returns(Rs/ha), Net returns(Rs/ha) and B:C ratio

Treatments	Gross returns(Rs/ha)		Net returns(Rs/ha)		B:C ratio	
	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
Main plot(03-different interval of sowing)						
D_1	64,147	57,676	45,967	39,496	2.53	2.17
D_2	63,194	56,080	45,014	37,891	2.48	2.08
D_3	55,409	51,091	37,229	32,920	2.05	1.81
Subplot(04-different genotypes)						
CSH-25	64,464	58,452	46,284	40,273	2.55	2.22
CSH-30	67,633	60,640	49,453	42,460	2.72	2.34
CSV-23	58,656	54,212	40,477	36,032	2.23	1.98
CSV-25	52,912	46,502	34,732	28,322	1.91	1.56

Economics

Increased in gross returns (Rs. 64,147/ha and Rs. 57,676/ha), Net returns (Rs. 45,967/ha and Rs. 39,496/ha), Benefit: Cost ratio (2.53 and 2.17) from the both the year of study were recorded by first fort night of may sowing. Due to increase in the growth, yield attritubes and grain yield of sorghum by effective utilization of early kharif rainfall during the early development stage.

Among the varieties/hybrids, CSH-30 reported higher gross returns (Rs. 67,633/ha and Rs. 60,640/ha), Net returns (Rs. 49,453/ha and Rs. 42,460/ha) and Benefit: Cost ratio (2.72 and 2.34) from both the years of research (2017-18 and 2018-19). As there is an increase in the yield of sorghum hybrid CSH-30, inferred that early sowing, moisture availability during the vegetative growth stage and variation in the maturity of hybrid as compared to varieties (CSV-23 and CSV-27) and hybrid (CSH-25) enhanced the remunerative value of produce.

Conclusion

From the results it is concluded that first fortnight May sowing increased the yield, gross returns, net returns and Benefit : cost ratio of sorghum and with respect to the genotypes CSH-30 out yield other genotypes in the study by recording the higher yield, gross returns, net returns and Benefit : cost ratio of sorghum

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