Andhra Pradesh J Agril. Sci : 3(4): 259-260, 2017

PERFORMANCE OF DUAL PURPOSE SORGHUM (*Sorghum bicolor* (L.) Moench) VARIETIES UNDER VARIED CROP GEOMETRY

V. PRUTHVI GOUD, A.V. NAGAVANI*, D. SUBRAMANYAM AND M.V.S. NAIDU

Department of Agronomy, S.V. Agricultural College, ANGRAU, Tirupati-517 502, Chittoor Dt., Andhra Pradesh.

Date of Receipt: 16-06-2017 Date of Acceptance: 27-11-2017

ABSTRACT

A field experiment was conducted during *rabi*, 2016 at S.V. Agricultural College Farm, Tirupati (dry land or wet land) to study the effect of varieties and crop geometry on the growth parameters and yield attributes of dual purpose sorghum. The results revealed that M 35-1 was found to the most promising genotype in obtaining higher plant height (179.4 cm), leaf area index (18.8), dry matter production (5596.0 kg ha^{-1}) and highest light intensity(87.4%) was recorded with CSV- 15. Crop geometry of 60 cm x 10 cm recorded maximum plant height (175.5 cm), leaf area index (19.45) and dry matter production (5715.5 kg ha^{-1}) and light intensity (86.9 %) followed by 45 cm x 15 cm spacing.

KEYWORDS: Dual purpose sorghum, varieties, crop geometry and growth parameters, leaf area index (LAI).

INTRODUCTION

Sorghum is one of the most important cereal crops grown for food, fodder, feed and biofuel. Sorghum ranks 5th in world wide economic importance among cereal crops with an annual sorghum production of 60 million tonnes. India contributes about 16 per cent to the world's annual production. It is called as "The camel of crops" because of its ability to grow in arid and semi- arid soils and with stand prolonged drought. Sorghum is mainly cultivated as rainfed crop during monsoon and with residual moisture in *rabi* season. However, the yield levels are very low during *rabi* where the crop has to tolerate prolonged soil moisture stress. It is one of the most component crops of agriculture and animal husbandry and dominating the rural economy in dry land areas of India

The level of plant population at which biological yield reaches a plateau is the level of plant population at which maximum economic yield is obtained. Blummel and Reddy (2006) reported substantial variation in the fodder value of sorghum stover and supported the concept of genetic enhancement to improve the dual-purpose sorghum cultivars under varied crop geometry.

MATERIAL AND METHODS

A field experiment was conducted during *rabi* season of 2016 at S.V. Agricultural College Farm, Tirupati. The experimental soil was silty clay loam in texture, neutral in reaction (pH 7.1), low in organic carbon (0.29 per cent) and available nitrogen (188 kg ha^{-1}), medium in available phosphorus (23 kg ha^{-1}) and high in available potassium (176 kg ha^{-1}).

The experiment was laid out in RBD with factorial concept with three replications. The treatments consisted of four varieties *viz*., CSV -15 (V_1), CSV- 20 (V_2), NTJ-2 (V_3) and M-35-1 (V_4) while the treatments of crop geometry were C_1- 30 cm x 20 cm, C_2 – 45 x 15 cm and C_3 – 60 x 10 cm. The recommended dose N, P_2O_5 and K_2O were applied through urea, single super phosphate and muriate of potash, respectively. Nitrogen was applied in the form of urea as two spilt doses one at the time of sowing and remaining half at 35 DAS.

RESULTS AND DISCUSSION

Performance of genotypes

Significantly higher plant height, leaf area index and dry matter production was recorded with M-35-1 (V_4) which was significantly superior to rest of the varieties, while higher light intensity was registered with the variety CSV- 1. The lowest values were registered with variety CSV- 20 (V_2). This might be due to higher photosynthetic area in terms of plant height and LAI as a result of more number of plants unit $area^{-1}$ coupled with efficient absorption of nutrients and water from the soil which leads to increased dry matter production unit $area^{-1}$. These results are in accordance with those of Ramesh (2002).

*Corresponding author, E-mail: vaniayitepalli@yahoo.com

Table 1.

Treatments	Plant height (cm)	Leaf area index	Dry matter production (kg ha^{-1})	Light intensity
Varieties				
V_1 : CSV- 15	176.1	16.45	5502.3	87.4
V_2 : CSV- 20	160.2	10.89	4883.8	82.9
V_3 : NTJ - 2	172.9	14.20	5011.8	86.8
V_4 : M –35-1	179.4	18.80	5996.4	86.0
SEm±	1.93	0.57	237.02	0.81
CD (P= 0.05)	5.6	1.5	681.9	2.4
Crop geometry				
C_1 : 30 x 20	168.6	13.94	4956.1	84.3
C_2 : 45 x 15	172.3	15.52	5336.7	86.1
C_3 : 60 x 10	175.5	19.45	5715.5	86.9
SEm±	1.67	0.51	200.07	0.71
CD (P= 0.05)	4.9	1.5	590.5	2.0

Effect of crop geometry

The highest plant height, leaf area index, dry matter production and light intensity was recorded with the crop geometry of 60 x 10 cm followed by 45 x 15 cm spacing. The lowest values were recorded with crop geometry of 30 x 20 cm. Improvement of LAI might have increased the photosynthetic efficiency of crop and induced to produce more dry matter production. This was in accordance with the earlier findings of Borale *et al*. (2002) and Kalaraju *et al*. (2011). The highest light interception of sorghum was recorded with spacing of 60 cm x 10 cm where as the lowest light interception was associated with 30 cm x 20 cm. Increase in light interception was due to increased growth parameters of sorghum. These findings were in close conformity with those of Rathika *et al.*(2013).

CONCLUSION

In conclusion, the investigation revealed that the higher growth parameters were obtained with the cultivation of dual purpose sorghum variety M-35-1 at crop geometry of 60 cm x 10 cm has been found suitable and recorded the maximum economic returns.

LITERATURE CITED

Blummel, M and Reddy, B.V.S. 2006. Stover fodder quality traits for dual-purpose sorghum genetic improvement. *International Sorghum Millet Newsletter*. 47: 87-89.

Borale, J.S., Patil, T.R., Kagane, B.V and Mahalle, A.M. 2002. Dry matter accumulation and its distribution in various plant parts in finger millet (*Eleusine coracana* (L.) Gaertn). *Journal of Soils and Crops.* 12(1): 40-48.

Kalaraju, K., Deva Kumar, N., Nagaraju, N and Ningappa, K.B. 2011. Effect of methods of planting on growth and yield of finger millet genotypes under organic farming. *Research on Crops*. 10(1): 20-24.

Ramesh, G. 2002. Effect of plant density on growth and yield of *rabi* groundnut varieties. *M.Sc. (Ag.) Thesis*, Andhara Pradesh Agricultural University, Rajendranagar, Hyderabad.

Rathika, S., Velayunghan K., Thavaprakash, N and Amesh, T. 2013. Weed smothering efficiency and productivity as influenced by crop geometry and intercropping in baby corn (*Zea mays* L.). *Journal of Progressive Agriculture*. 4(1): 87-90.