

Growth, yield and quality of sorghum [*Sorghum bicolor* (L.) Moench] as influenced by planting densities, genotypes and different levels of nitrogen

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ABSTRACT : Field experiment was conducted during summer season of 2006 at Research Farm of College of Agriculture, Indore, Madhya Pradesh to investigate the effect of plant density, genotypes and nitrogen levels on cane and grain yield of sweet sorghum. The results showed that the higher grain yield (2427 kg/ha) along with cane yield and juice yield was recorded under plant density 45 cm × 15 cm. Plant density of 45cm × 15cm gave higher gross returns (Rs 37592/ha), net returns (25871/ha) and benefit cost ratio (3.21). Among the genotypes, NSSH-104 was found better in respect of all the growth characters as well as yields attributing characters and yield. A positive correlation was observed between the growth, yield attributes and yield along with higher levels of nitrogen applied. Application of 120 kg N/ha was found suitable and recorded the maximum yields and monetary returns and benefit cost ratio.

Key Words : *Sorghum bicolor*, growth, cane and grain yield, planting densities, genotypes, nitrogen level.

Table-1: Effect of plant density, genotypes and nitrogen levels on growth parameters of sorghum.

Treatment	Plant Height (cm)	No. of Functional Leaves	Flag Leaf Area (cm ² /Plant)	Dry Weight (g/Plant)
Plant density				
45cm x 15cm	195.2	8.03	35.08	50.41
60cm x 15cm	200.4	8.03	37.63	54.2
SEm ±	1.32	0.03	0.53	0.77
CD (5%)	4.57	NS	1.88	2.66
Genotypes				
SSV-84	178.63	7.79	34.57	44.28
NSSH 104	216.96	8.27	38.14	60.33
SEm±	1.32	0.03	0.53	0.77
CD(5%)	4.57	0.1	1.83	2.66
Nitrogen levels				
30 kg/ha	190.68	7.86	28.51	45.56
60 kg/ha	197.6	8.03	32.76	49.7
90 kg/ha	199.86	7.94	38.97	53.96
120 kg/ha	204.15	8.29	45.18	59.99
SEm ±	1.95	0.05	0.93	0.83
CD (5%)	5.68	0.14	2.72	2.43

Table-2: Effect of plant density, genotypes and nitrogen levels on yield attributes of sorghum.

Treatment	Ear head length (cm)	Ear head weight (g)	Grain weight /earhead (g)	1000 grain weight (g)
Plant density				
45cm x 15cm	23.26	48.66	41.58	21.09
60cm x 15cm	24.58	51.49	48.5	21.93
SEm ±	0.32	0.78	0.58	0.33
CD (5%)	1.1	2.7	2.02	1.13
Genotypes				
SSV-84	21.64	48.56	42.58	20.64
NSSH 104	26.19	51.59	47.5	22.38
SEm±	0.32	0.78	0.58	0.353
CD(5%)	1.1	2.7	2.02	1.13
Nitrogen levels				
30 kg/ha	21.56	40.15	38.42	11.41
60 kg/ha	23.01	45.38	42.33	17.52
90 kg/ha	24.99	52.45	47.58	26.49
120 kg/ha	26.19	62.32	51.83	30.61
SEm ±	0.39	0.98	1.37	0.71
CD (5%)	1.14	2.87	4.00	2.06

Table-3: Effect of plant density, genotypes and nitrogen levels on yield and economics of sorghum.

B: C

Treatment	Grain yield (kg/ha)	Cane yield (kg/ha)	Fodder yield (kg/ha)	Juice extra- ction (%)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B: C ratio
Plant density							
45 cm x 15cm	2427	24637	36680	49.96	37592	25871	3.2
60 cm x 15cm	1967	23899	35860	40.03	34748	23158	2.99
SEm ±	33	243	410	0.62	436	397	0.04
CD (5%)	115	NS	NS	2.13	1509	1375	0.13
Genotypes							
SSV-84	1312	21830	32790	46.05	29414	17877	2.54
NSSH 104	3082	26705	39750	43.93	42926	31152	3.65
SEm ±	33	243	410	0.62	436	397	0.04
CD(5%)	115	839	1400	2.13	1509	1375	0.13
Nitrogen levels							
30 kg/ha	1720	20861	31060	39.33	30257	18963	2.7
60 kg/ha	2077	23552	35930	42.4	35275	23711	3.06
90 kg/ha	2366	25403	38110	47.03	38462	26760	3.26
120 kg/ha	2626	27255	49970	51.21	40687	28625	3.35
SEm ±	31	374	670	1.29	618	626	0.06
CD (5%)	92	1091	1940	3.78	1804	1828	0.16

