

CANE YIELD AND SUGAR POTENTIAL OF SUGAR CANE PROMISING GENOTYPES UNDER THE AGRO-CLIMATIC CONDITION OF BANNU NWFP.

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ABSTRACT

The response of total 73 promising genotypes of sugarcane was studied in seventeen different trials at Agricultural Research Station, Serai Naurang (Bannu) during 2008-09 and 2009-2010. Variety S-98-SP-341 showed the highest significant average cane yield of 149.06 and 143.57 t ha⁻¹, followed by varieties Bannu-1, S-98-CSSG-557 and Bannu-3 showing next higher average at par average, cane yield of 138.47, 135.63 and 131.63 t ha⁻¹ respectively. Varieties MS-91-CP-582, S-98-CSSG-676 responded with maximum sugar recovery of 12.36 and 12.0 % respectively. The highest sugar yield (14.7 t ha⁻¹) was recorded for S-98-CSSG-557, followed by Bannu-3 and S-98-CSSG-676 possessing at par sugar yield of 13.22 and 13.05 t ha⁻¹ respectively.

Key Words: Sugar cane varieties yield, sugar potential.

INTRODUCTION

Sugarcane is a high value cash crop and plays vital role in improvement of socio economic condition of farming community, industry and trade situation. Being a major source of white sugar it generates national income through excise duty and its by products like molasses, baggass etc are utilized for several purposes. Thus it is a multi purpose cash crop and engages millions of people on various aspects. In Pakistan sugarcane meets 75% requirements of sugar production and almost the total production is insufficient for existing 82 sugar mills. Pakistan ranks 5th in cane growing countries, covering about 1.00 million hectares area annually, while sugar industry is 2nd to textile. In NWFP sugar cane is grown on about 0.04 million hectares and its production is inadequate to meet the existing sugar mills. According to Bollmann *et al* (2007) our sugar demand is the highest on national level i.e. 3.8 million tons (25kg per capita) as compared to developing countries.

The average cane yield, sugar % is lower both on Provincial and national level (47–50 t ha⁻¹ and 8.0- 8.6 %) as compared to world average i.e. 63.7 t ha⁻¹ and 10.6 %. Main cause for low cane, sugar potential is that 58 % varieties are unapproved and of inferior quality in the country. . In southern part of NWFP mostly old, susceptible varieties like Triton and Co-1148 are grown on commercial level. Although quite standard yield of 30–140 t ha⁻¹ with 11.27 % of sugar recovery was recorded for varieties S-88-US-479 and Thata-10 by Bahadar *et al.*, 2007.

According to Majid M.A and A. Shahid the total cane production share is 65, 25 and 10 % for Punjab, Sindh and NWFP respectively. They reported average cane yield of 48.8 t ha⁻¹ with total area as 0.907 million hectares of sugarcane on country level. Sugar cane cultivation is gradually increasing in Southern parts of NWFP due to establishment of new Sugar mills. Keeping in view the demand of farming community necessary research activities are under process at this Regional Research Station for evaluation of new quality/suitable varieties for southern parts of the Province.

MATERIALS AND METHODS:

The response of seventy-three promising genotypes was studied in seventeen different trials at Agricultural Research Station, Serai Naurang (Bannu) during 2008-09 and 2009-2010. The trials were conducted in RCB design with three replications in net plot size of 3.0 x 5.0 m with rows 75 cm apart. Recommended levels of NP @ 150-56 kg were applied to the trials at appropriate stages. Phosphatic fertilizers were applied at the time of land preparation. Weedicide Gaxapex Combi was applied @5.6 kg/ha during the month of February for the control of weeds. Insecticide Carbofuran Granules were applied @12 kg/ha in two equal doses with 25-30 days interval in the month of May-June. Nitrogenous fertilizers were applied in two uniform doses in the above duration/interval. Necessary observations were regularly recorded on major parameters. Data on cane yield was analyzed statistically through computer package M-STATC.

RESULT AND DISCUSSION

Cane yield

The data mentioned in table.1-16 revealed significant difference in varietal means for cane yield. Variety S-98-SP-341 exhibited the highest significant average cane yield of 149.6 and 143.57 t ha⁻¹ (Table- 11,12) followed by varieties Bannu-1, S-98-CSSG-557 and Bannu-3, possessing the next higher and at par cane yield of 138.47, 135.63 and 131.63 t ha⁻¹ respectively (Tables- 13,15,10). Similar results were reported by other scientists. Kaloi *et al.*, (2007) recorded the maximum cane yield of 146.48 t ha⁻¹ for variety HoTh-326. Anonymous also reported higher cane yield of 123.49 t ha⁻¹ for variety Bannu-1. Ghaffar *et al.*, (2008) obtained the average cane yield of 94.17 t ha⁻¹ from variety CP-85/1491. According to Panhwar *et al.*, (2008), HoTh-318 exhibited better cane yield of 119.26 t ha⁻¹. Nadeem *et al.*, 2009 recorded average 101.77 t ha⁻¹ of cane yield for S-2002-US-312. Anonymous 2009 found S-2001-US-400 with 86.3 t ha⁻¹ average cane yield.

Sugar percentage

According to the data in table- 7 variety MS-91-CP-582 responded with the maximum sugar recovery (12.36 %), followed by S-98-CSSG-676 showing average 12.0 % of sugar contents (Table- 6). The results are in accordance with Anonymous, 2007 who reported MS-91-CP-223 and S-98-CSSG-676 with higher sugar recovery i.e. 12.34 and 12.0 % respectively. Bahadar *et al* 2007 also recorded better sugar contents of 11.27 % for Thatta-10. Kaloi *et al* 2007 found HoTh-348 with highest sugar contents i.e. 14.86 %. Panhwar *et al.*, 2008 reported HoTh-307 and HoTh-349 with higher sugar recovery of 12.89 and 12.85 % respectively. According to Nadeem *et al.*, 2009, S-2002-US-312 possessed higher sugar of 13.84 %.

Sugar yield.

According to table- 15 variety S-98-CSSG-557 showed the maximum sugar yield of 14.7 t ha⁻¹ followed by Bannu-3 and S-96-SP-302 producing statistically at par average sugar yield of 13.22 and 13.05 t ha⁻¹ respectively (Table 10,11). The results are analogous with anonymous 2007 who found NSG-555 with better sugar yield (13.38 t ha⁻¹). Accordingly Kaloi *et al.*, 2007 recorded the highest sugar yield (20.6 t ha⁻¹) for HoTh-2109. Panhwar *et al.*, 2008 also obtained higher sugar yield (15.46 t ha⁻¹) from HoTh-38. Similarly Ghaffar *et al.*, 2008 recorded average sugar yield of 10.8 t ha⁻¹ for CP-85/1491. Munir *et al.*, 2009 also found better sugar yield for HSF-240 i.e. 13.61 t ha⁻¹. According to Nadeem *et al.*, 2009, S-2002-US-312 responded with comparatively higher average sugar yield of 14.8 t ha⁻¹.

Table 1. Varietal evaluation trial-Early season (Plant crop 2008-09)

S. No	Variety	Cane yield Mt ha ⁻¹	Recovery %	Sugar yield Mt ha ⁻¹
1	Bannu-3	8.56	10.20	8.22
2	Naurang-98	84.75	9.61	8.14
3	CP85/1491	81.95	10.00	10.48
4	MS-93-CP223	110.82	10.81	12.0
5	CPHS-35	74.11	10.42	7.72
6	MS-94-CP-90	78.69	10.52	7.87
7	S-98-CSSG-709	92.68	9.05	8.39
8	S-97-US-141	88.94	9.8	8.72
9	CP-88/1165	66.58	9.43	6.28
10	CP-89/846	96.9	9.28	9.00

Table 2. Varietal trial-Early season (2nd Ratoon crop 2008-09)

S. No	Variety	Cane yield Mt ha ⁻¹	Recovery %	Sugar yield Mt ha ⁻¹
1	S-96-SP-1058	65.44	11.12	7.28
2	S-88-US-479	66.61	10.94	7.28
3	MS-91-CP-586	57.13	10.483	5.98
4	S-78-US-421	49.96	11.56	5.77
5	CP-89/846	51.48	11.55	5.94
6	Bannu-3	58.03	10.67	6.19
7	CP-88/1165	72.65	11.55	8.39
8	S-87-US-1819	53.99	10.61	5.73
9	S-96-SP-571	39.36	9.57	3.76
10	S-97-US-128	45.84	8.98	4.12
11	Naurang-98	77.1	10.32	7.95
12	CP-85/1491	66.88	7.15	4.78
13	MS-91-CP-90	53.19	10.92	5.81
14	S-87-US-1327	61.87	10.48	6.48
15	CPHS-35	64.24	8.66	5.56
16	CPF-236	68.18	10.96	7.47