RESPONSE OF TWO CANE VARIETIES TOWARDS QUALITATIVE AND QUANTITATIVE CHARACTERISTICS DUE TO SOWING OF STALE SETTS

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ABSTRACT

Two sugarcane varieties HSF-242 and CPF-236 were harvested in the last week of February ,stored in shade and were sown in RCBD with the interval of three days to evaluate the effect of stale cane setts' sowing. Germination, tillers per plant and cane yield of variety HSF-242 decreased from 39.20 to 21.59, 2.38 to 2.04 and 62.63 to 38.34 tha-1 respectively when it was sown with twelve days stale setts whereas germination, tillers per plant and cane yield of variety CPF-236 reduced from 37.26 to 17.50, 1.77 to 1.49 and 57.59 to 39.73 respectively under similar treatments. The experiment concluded that delayed sowing of harvested cane deed adversely affected the major quantitative parameters.

Key words: Cane, varieties, stale, yield, quality

INTRODUCTION

Sugarcane is an important cash crop of Pakistan (Ahmad *et al.,* 1991) which is propagated by cuttings of stalks containing buds (Dilewijin, 1952). Its growth and yield depends upon germination, tillering and cane count etc. Germination, the critical period and basis of safe cane crop (Dilewijin,1952), is influenced by quality of seed material used. Tillering plays a pivotal role in establishing cane stand (Aslam *et al.,* 2001). Similarly cane yield is a desirable characteristic for farmers and recoverable sugar for millers and breeder's point of view (Atta *et al.,* 1992).

All the above mentioned yield and quality parameters depend upon quality of seed setts used for sowing i.e. fresh healthy with non injured buds and vice versa. In Pakistan, farmers obtain cane seed from farm located hundreds of kilometers away from their field. This long distance makes their seed stale with injured buds that adversely affect various growth and yield parameters. The older buds are more prone to mechanical injury (Yadava, 1991). Thus the present study was planned with a novel idea to determine the effect of stale cane seed on germination, tillering, cane yield, CCS and sugar recovery. The literature does not support it much as a little work has been conducted in this regard.

Materials and methods: The reported studies were conducted under semi arid climate on loan soil using spring planted cane varieties HSF-242 and CPF-236. The crop was sown in deep trenches (according to treatments), fertilized @ 168-112-112 NPK kg ha^{-1} and harvested after one year. All agronomic and cultural practices like weeding, irrigation, earthing up and plant protection measures were adopted as and where considered necessary during the course of experiment.

Before sowing, double budded setts were cut, stored under cane trash to check evaporation and sown @ 80,000 DBS ha^{-1}. The germination and tillers per plant were recorded 45 and 90 DAS while yield was noted at harvest. CCS and sugar recovery were calculated by crushing one composite sample from each replication of each treatment according to procedures laid out in Sugarcane Laboratory Manual for Queensland Sugar Mills (1970). All the qualitative and quantitative treatment means were subjected to statistical analysis to judge their superiority (Steel and Torrie, 1980).

The details of treatments are as follows:

T1= Fresh cane setts used for sowing
T2= Tree days stale cane setts used for sowing
T3= Six days stale cane setts used for sowing
T4= Nine days stale cane setts used for sowing
T5= Twelve days stale cane setts used for sowing

RESULTS AND DISCUSSION

Germination: A decrease in germination percentage with increasing seed setts' staleness was recorded in both varieties .In HSF-242, maximum germination (39.20%) was recorded in T1 while minimum (21.58%) in T5. Similarly maximum germination in CPF-236 was noticed in T1 (37.26%) while minimum in T5 (17.50%). These results confirm Yadava (1991) who stated that older buds were relatively less successful.

Tillers per plant: A trend analogous to germination was also found in tillers per plant in both varieties. Average tillering data envisaged, maximum number of tillers per plant (2.08) in T1 where fresh cane seed setts were sown and minimum in T5 (1.77) where 12 days old setts were used .Higher tillering due to higher germination was also examined by Ali *et al.,* (1999) while studying the performance of different sugarcane varieties.

Cane yield: Tabulated data showed that cane yield was directly affected by germination and tillering. A higher germination and tillering produced heavy tonnage and vice versa. Twelve days stale seed gave minimum yield 38.34, 39.73 and 39.04 tha^{-1} in HSF-242, CPF-236 and on average basis respectively. Highest germination produced highest cane yield and highest tillering gave rise to highest yield was also investigated by Bajwa *et al.,* (1993) and Atta *et al.,* (1992) in their separate studies of sugarcane varietals trial.

CCS and sugar recovery: Results showed that both CCS and sugar recovery were interrelated with each other with respect to increasing and decreasing trend but not with germination, tillering and yield. The maximum CCS, on average basis, was noticed in T2 (14.33%) and it was followed by T3 (13.47%), T1 (13.42%), T4 (13.41%) and T5 (13.120%) in descending order. Similar trend was recorded in sugar recovery. Bajwa *et al.,* (1993) also noticed same observations while studying performance of twelve varieties that CCS was independent of germination and yield.

Conclusion: Use of stale cane setts as seed did not affect CCS and sugar recovery but it adversely decreased germination, tillering and yield.

Table-1 Qualitative and quantitative response of sugarcane varieties to freshly and stale sown cane seed (Two years mean data)

Treatments	HSF-242					
	Germination (%)	Tillers/plant	Cane yield (t ha^{-1})	Sugar yield (t ha^{-1})	CCS (%)	Sugar recovery (%)
T1= Fresh cane setts used for sowing	39.20 a	2.38	62.63 a	8.20 a	13.073	12.29
T2= Tree days stale cane setts used for sowing	29.24 b	2.30	48.76 b	6.52 b	15.017	14.12
T3= Six days stale cane setts used for sowing	23.65 bc	2.18	45.38 b	6.10 b	13.413	12.61
T4= Nine days stale cane setts used for sowing	22.93 c	2.07	44.96 b	5.91 b	13.077	12.29
T5= Twelve days stale cane setts used for sowing	21.59 c	2.04	38.34 c	4.92 c	12.877	12.10
LSD	5.70	N.S	5.87	0.96	N.S	N.S
	CPF-236					
T1= Fresh cane setts used for sowing	37.26 a	1.77	57.59 a	7.91 a	13.760	12.93
T2= Tree days stale cane setts used for sowing	29.08 b	1.70	53.84 ab	7.32 ab	13.633	12.81
T3= Six days stale cane setts used for sowing	22.34 bc	1.64	47.15 bc	6.48 bc	13.530	12.72
T4= Nine days stale cane setts used for sowing	22.30 bc	1.55	43.56 c	5.99 cd	13.747	12.92
T5= Twelve days stale cane setts used for sowing	17.50 c	1.49	39.73 c	5.35 d	13.513	12.70
LSD	7.96	N.S	8.82	1.08	N.S	N.S
	AVERAGE OF TWO VARIETIES					
T1= Fresh cane setts used for sowing	38.23	2.08	60.11	8.06	13.42	12.61
T2= Tree days stale cane setts used for sowing	29.16	2.00	51.30	6.92	14.33	13.47
T3= Six days stale cane setts used for sowing	23.00	1.91	46.27	6.29	13.47	12.67
T4= Nine days stale cane setts used for sowing	22.62	1.81	44.26	5.95	13.41	12.61
T5= Twelve days stale cane setts used for sowing	19.55	1.77	39.04	5.14	13.20	12.40

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