

## EVALUATION OF SOME SUGARCANE CLONES AT FAISALABAD

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### ABSTRACT

A field experiment was planned with the objective to evaluate performance of ten sugarcane clones namely S2002US-234, S2002US-312, S2002US-447, S2002US-452, S2002US-463, S2002US-628, S2002US-635, S2002US-747, SPF-213 (standard) and HSF-240 (standard) under semi arid climatic conditions of Faisalabad. Statistically significant results showed that clone S2002US-312 crossed all its counter parts, including standards, by producing maximum cane yield (101.77 t/ha), CCS (13.84%) and sugar yield (14.08 t/ha). The remaining clones recorded significant and variable results with respect to germination, tillering, number of millable canes, cane yield and sugar yield.

Key words: Sugarcane, clones, CCS, sugar yield, cane yield.

### INTRODUCTION

Sugarcane is an important cash crop and plays a vital role in the country's economy. Millions of people are engaged in sugarcane production, industrial processing and trade (Bashir *et al.*, 2005). In Pakistan, a slight increase in cane yield (0.69%) has been recorded its annual yield was 48887 Kgs/ha during 2004-05 which increased up to 49229 kgs/ha in 2005-06 (GOP, 2006). However this small increase is not enough to meet the nation's sugar demand. Low cane yield may be due to poor management, low seed rate, poor quality seed, and low yielding varieties both in tonnage and quality limit production to a considerable extent (Ahmad, 1998). Low rate of sugarcane productivity and sucrose recovery can be attributed to low yielding varieties (Afghan *et al.*, 1994). Sugarcane varieties show great variation in expression of genotypic and phenotypic characters in various sets of ecological conditions (Malik *et al.*, 1993). Unawareness of farmers in adaptation of varieties is also the prime cause of low cane yield (Jamro *et al.*, 2000). So there is a dire need to evaluate high yielding varieties with the course of time. The studies made in the past regarding the topic is given below.

Aslam *et al.*, (1998) recommended a new cane variety SPF-234 for cultivation in southern Punjab of Pakistan after comparing nine clones in that region. SPF-234 germination (38.48%), tillers per plant (3.32), cane weight (1.25 kg) cane stand (111296 canes/ha), cane yield (139.43 t/ha) and sugar yield (14.06 t/ha). Singh *et al.*, (1992) compared different agronomic characteristics of twelve promising sugarcane varieties under rainfed conditions and found Cos 8118 and B091 best as it produced 78.2 and 73.9 t/ha millable tillers respectively. Ricaud and Domaigue (1991) studied the performance of some newly introduced and standard commercial cultivars in Mauritius and recommended cv. M1658/78 as the excellent variety because of its higher yield and sucrose contents as well as its wide adaptation to different soils and climatic regions of island. Rehman *et al.*, (1989) studied qualitative and quantitative characteristics of eleven sugarcane varieties and declared BF-162 as the best in cane and sugar yield over the other varieties compared. Alvarez *et al.*, (1989) recommended five varieties namely IAC-58/243, IAC-69/307, IAC-363, IAC-68/245 and IAC-69/426 among twenty five varieties studied by him.

Keeping in view the above research works the present studies of some important sugarcane clones was made under semi arid climatic conditions of Faisalabad.

## **MATERIALS AND METHODS**

A one year field trial was undertaken to evaluate the performance of ten sugarcane clones under the agro-climatic conditions of Faisalabad. Sowing and harvesting of crop was done in the month of March each year respectively. The crop was sown @ 70,000 DBS/ha in deep trenches in which fertilizers NPK were applied @ 168-112-112 Kgs/ha. All potash and phosphate fertilizers were applied at the time of sowing while nitrogenous fertilizers were split into three doses. Plant protection measures, cultural operations and other agronomic practices were adopted as and when considered necessary. The data regarding germination and tillering were recorded after one and half month and three months of sowing while all other parameters, excluding CCS, were recorded at harvest. CCS was determined from the samples harvested after one month interval during crushing season from October to April by the methods described in laboratory manual (Anonymous, 1970). After completing the process of laboratory and field analysis, the data thus collected were subjected to statistical analysis to compare the superiority of means using LSD at 5% probability level for testing significance differences as suggested by Steel and Torrie (1980).

## **RESULTS AND DISCUSSION**

The results of the study are packed in Table. The brief discussion of studied characters is given in the coming lines one by one.

### **Germination**

It is the most critical factor because it plays a potential role in establishing cane stand in the field. The data given in table indicated that differences in the clones were significant for germination. A perusal of data indicated that maximum germination (40.19%) was recorded in case of S2002US-747 followed by S2002US-463, S2002-452, S2002-US-628, S2002US-635, S2002US-312, S2002US-447 and S2002US-234 producing germinates as 38.48%, 33.58%, 31.62%, 30.76%, 30.02%, 21.81% and 21.20% respectively when eight clones were compared with standard HSF-240, however all clones failed to produce higher germinants than SPF-213 (53.77%). Highly variable germination among different cane cultivars was also recorded by Agrawal *et al.*, (1991).

### **Tillers per plant**

The extent and nature of tillering till maturity depends upon planting technique, water, nutrient availability and a number of other external and internal factors. As far as tillering data is concerned, significantly variable tillering differences were observed among all clones. A situation similar contrary to germination was observed in tillering where no clone could generate higher number of tillers per plant when compared with early maturing standard HSF-240. But six clones namely S2002US-635, S2002US-628, S2002US-452, S2002US-463, S2002US-747 and S2002US-312 showed higher number of tillers per plant 3.03, 2.73, 2.52, 2.42, 2.31 and 2.26 when compared with medium and late maturing standard SPF-213 (2.14). Variable tillering for different cane clones was also described by Tai *et al.*, (1995).

### **Number of millable canes**

It is the interaction as well as combination of germination, tillering, resistance against pests and pathogens. The data relating to number of millable canes indicated significant differences

among different cane clones. The tabulated data exhibited significant differences among clones showed that only two clones S2002US-628 and S2002US-463 in which higher number of millable canes than standards. Both the standards produced equal number of millable canes i.e. 101.74 000/ha. S2002US-628 and S2002US-463 were also statistically at par with SPF-213 and HSF-240. The minimum cane count (30.12 000 /ha) was noticed in S2002US-234. Ali *et al.*, (1999) made similar studies of some sugarcane varieties.

### Cane yield

Cane yield is the most desirable character which correlates with the fresh weight harvested. The data related to cane yield shows significant differences among all clones. Four clones yielding canes above SPF-213 were S2002US-312 (101.77 t/ha), S2002US-452 (101.39 t/ha), S2002US-463 (98.61 t/ha) and S2002US-628 (93.40 t/ha). The former three clones also crossed HSF-240 with respect to cane yield. This explanation is in harmony with those described by Nanda *et al.*, (1994).

### CCS

Commercial cane sugar provides the quality and maturity judgment for a variety. It is evident from data table that all the clones showed variable results with respect to CCS. The data revealed that six clones namely S2002US-312, S2002US-452, S2002US-447, S2002US-463, S2002US-635 and S2002US-747 gave higher CCS as 13.84%, 12.82% 12.35%, 12.01%, 11.94% and 11.82% than standard SPF-213. The first two clones S2002US-312 and S2002US-452 revealed higher commercial cane sugar than standard HSF-240. Nuss (1993) elucidated the same facts.

### Sugar yield

It is obtained from the combination of stripped cane yield and corresponding recoverable sugar percentage. The tabulated data indicated that sugar yield of five clones S2002US-312, S2002US-452, S2002US-463, S2002US-628 and S2002US-747 was higher than medium and late maturing standard SPF-213 while S2002US-312 and S2002US-452 yielded higher sugar than early maturing standard HSF-240. These data trend are in line with those reported by Singh *et al.*, (1993).

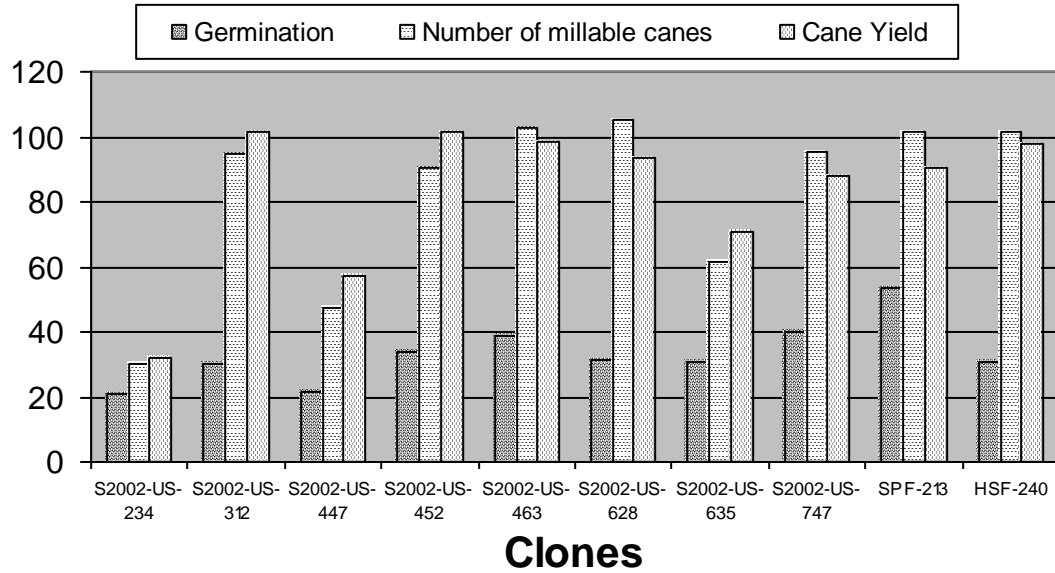
**Table                      Agronomic and quality characteristics of different sugarcane clones**

Sr. No.	Clones	Germination (%)	Tillers plant <sup>-1</sup>	Millable canes (000/ha)	Cane yield (t/ha)	CCS (%)	Sugar yield (t/ha)
	S2002-US-234	21.20e	1.15c	30.12f	31.78e	11.33	3.60e
	S2002-US-312	30.02d	2.26ab	94.86bc	101.77a	13.84	14.08a
	S2002-US-447	21.81e	1.73bc	47.31e	56.94d	12.35	7.02d
	S2002-US-452	33.58bcd	2.52ab	90.62c	101.39a	12.82	13.00ab
	S2002-US-463	38.48bc	2.42ab	102.78ab	98.61ab	12.01	11.84bc
	S2002-US-628	31.62cd	2.73a	105.21a	93.40ab	11.24	10.50c
	S2002-US-635	30.76d	3.03a	61.72d	70.49c	11.94	8.42d
	S2002-US-747	40.19b	2.31ab	95.14bc	87.85b	11.82	10.38c
	SPF-213 (std.)	53.77a	2.14ab	101.74ab	90.28ab	11.52	10.40c
	HSF-240 (std.)	30.35d	2.94a	101.74ab	97.92ab	12.69	12.43b
	LSD at 5%	7.161	0.9254	9.840	12.05		1.475

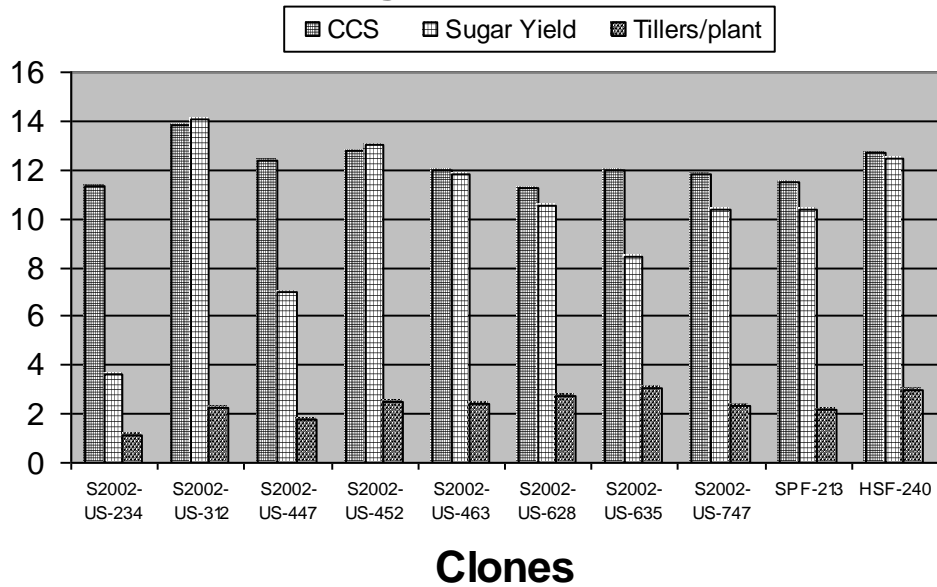
Std. = Standard

LSD = Least significant difference

## Agronomic and quality characteristics of different sugarcane clones



## Agronomic and quality characteristics of different sugarcane clones in Faisalabad



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