

ISSN : 1812-5379 (Print)  
ISSN : 1812-5417 (Online)  
<http://ansijournals.com/ja>

# JOURNAL OF AGRONOMY



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Asian Network for Scientific Information  
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

## Studies on Agro Ecological Suitability of Different BSRI Released Cane Varieties for Obtaining Higher Yield in Old Brahmaputra Flood Plain

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**Abstract:** A comparative study on the suitability of eight released BSRI sugarcane varieties Isd 2/54, LJC, Isd16, Isd 20, Isd 21, Isd 24, Isd 28 and Isd 29 were conducted at Melandah in Jamalpur district under old Brahmaputra Flood plain. Among these varieties Isd 2/54 and Isd 16 considered as standard varieties. It was found that the tested newly released varieties produced significantly higher cane yield compared to standard variety Isd 2/54 and found identical to Isd 16, a widely accepted high yielding variety. Therefore, there is a great scope to increase the production of cane by using newly released varieties in the farmers field under old Brahmaputra flood plain (AEZ 9).

**Key words:** Variety, suitability and agro ecological zone

### INTRODUCTION

The yield of a particular variety depends upon the heredity potential of the genotype and the environment where it is exposed to during the course of its life cycle. Variety of crops plays the most important part as regards the yield and quality of sugar cane is no exception<sup>[1]</sup>. Imam *et al.*<sup>[2]</sup> reported that improved technologies of cultural practices do not have much effect on the quality of a crop. Although most of the varieties now grown in the sugar mills zones of Bangladesh are recommended for cultivation throughout the country but a promising variety may not show good performance in all the ecological zones due to variations of agro climatic factors<sup>[1]</sup>. The yield potentials of all the cane varieties in specific zones have not yet been tested thoroughly. Moreover, a variety may not perform well for indefinite period. Barnes<sup>[3]</sup> and Humbert<sup>[4]</sup> reported that varieties of sugarcane after a considerable period of cultivation had a tendency to decline in yield and vigor and thus newly released latter varieties replaces the old ones<sup>[5]</sup>. Li and chu<sup>[6]</sup> reported that in Taiwan, a newly released variety suffered severe wind breakage loss and its necessary to ensure the adaptability of a variety in a particular area before recommendation Barnes<sup>[3]</sup> suggested that yield, juice quality, disease reaction and rationing power of new promising varieties need to be compared with those of standard varieties under commercial cultivation. The millable cane, height and diameter might have contributed to cane yield as reported by Singh and Sangwan<sup>[7]</sup>. Miah

*et al.*<sup>[8]</sup> observed that the varieties/clones having tall cane, more diameter and maximum number of millable cane have produced yield per hectare. Yadava<sup>[9]</sup> reported that the yield of a particular variety depends upon the heredity potential of the genotype and the environment where it is exposed to during the course of its life cycle. Paul *et al.*<sup>[10]</sup> observed that all the newly released sugarcane varieties tested produced significantly higher cane yield compared to standard variety. Considering the fact, this study was undertaken with six tested varieties and was setup at the growers field of Melandah in Jamalpur district under old Brahmaputra flood plain to evaluate the comparative performance of those newly released varieties.

### MATERIALS AND METHODS

The experiment were conducted at Melandah, Jamalpur in the growers field under Brahmaputra flood plain soil during the cropping seasons 1999-2000 and 2000-2001 with eight cane varieties of which six newly evolved and the rest two were commercial standard varieties. Each variety treated as a treatment. The treatments were as T<sub>1</sub>=Isd 2/54, (Standard) T<sub>2</sub>=Isd 16, (Standard), T<sub>3</sub>= LJC, T<sub>4</sub>=Isd 20, T<sub>5</sub> =Isd 21, T<sub>6</sub>=Isd 24, T<sub>7</sub>=Isd 28 and T<sub>8</sub>=Isd 29. The experiment was laid out in randomized complete block design (RCBD) with three replications. The unit plot size was 8 m x 6 m. The land was prepared well by bullock drawn country plough and trenches were prepared by hand spade. Two bud settlings were raised in soil bed nursery. Forty five days aged

Table 1: Comparative performance of different sugarcane varieties in the growers field under old Brahmaputra flood plain

Varieties	Tiller (x 10 <sup>3</sup> ha <sup>-1</sup> )	Millable cane (x 10 <sup>3</sup> ha <sup>-1</sup> )	Unit stalk wt. (kg)	Yield of cane (t ha <sup>-1</sup> )
Isd 2/54	237.20ab	134.70ab	1.03c	139.40c
Isd 16	218.80abc	117.10d	1.20b	140.50c
LJC	197.40c	137.00ab	1.09c	149.00bc
Isd 20	252.00a	141.30a	1.11c	155.10ab
Isd 21	227.00abc	130.10abc	0.91d	119.70d
Isd 24	221.20abc	129.00bc	1.06c	135.80c
Isd 28	241.80ab	120.90cd	1.26b	148.30bc
Isd 29	211.30bc	121.30cd	1.35a	162.60a

Treatments accompanied by different letters are significantly different as per DMRT(5%)

settlings of sugarcane were planted in the main field at the mid November 1999 and 2000 maintaining spacing 45x100 sq.cm. The experiment was harvested at mid January 2000 and 2001, respectively for two consecutive cropping seasons. A strip of sugarcane was transplanted around the entire experimental field as borderline to protect the experiment from the external elements. Fertilizers were applied at the rate of 149 kg N, 115 kg K, 156 kg P, 2.16 kg Zn and S 9.7 kg ha<sup>-1</sup>. Full dose of TSP, Gypsum, Zinc sulphate and 1/3rd MP were applied in the trenches and mixed thoroughly with soil by hand spade. Cow dung was used only during the cropping season 2000-2001 at the time of transplantation. The rest of MP and urea were applied in two equal split at early growth stage and late tillering phase. live irrigation was applied after transplantation, Intercultural operation like weeding, mulching, irrigation, disease and pest control were done as and when necessary. Data on the establishment of settling in the main field was recorded after one month of transplanting. Data on tillering was recorded at 180 days after planting and data on millable cane, unit stalk weight and yield of cane were recorded at harvest and analyzed statistically.

## RESULTS AND DISCUSSION

The result of the experiment for the cropping seasons 1999-2000 and 2000-2001 in the cumulative form has shown in the Table 1. It is seen from the table that there was no significant difference in tiller production among the genotypes except LJC which produced statistically lowest number of tillers (197.4x10<sup>3</sup>ha<sup>-1</sup>) than the standard variety Isd 2/54 and Isd 16. The findings partially supported the result of<sup>[1]</sup> who found variation in tiller production among different varieties. Considering the number of millable cane, it is observed that there was no significant difference among the tested varieties except the standard variety Isd 16 which produced significantly the lowest number of millable cane (117.1x10<sup>3</sup>ha<sup>-1</sup>). The highest number of millable cane was observed in Isd 20 (252.0x10<sup>3</sup>ha<sup>-1</sup>). The result corroborated with the findings

of Miah *et al.*<sup>[8]</sup> who found variation in number of millable cane production while studied the performance of promising clones/varieties. In case of unit stalk weight, there was no significant difference among Isd 2/54, LJC, Isd 20 and Isd 24 except Isd 16, Isd 21, Isd 28 and Isd 29. The highest unit stalk weight was found in the variety Isd 29 (1.35 kg), Isd 28 (1.26 kg) and the lowest in Isd 21 (0.91 kg). In case of cane yield all the tested varieties except Isd 21 produced statistically similar yield. The lowest yield was found in the variety Isd 21 (119.7 t ha<sup>-1</sup>). The higher cane yield was produced by Isd 29 (162.6 t ha<sup>-1</sup>), Isd 20 (155.1 t ha<sup>-1</sup>) and Isd 28 (148.3 t ha<sup>-1</sup>) which significantly different from the standard variety Isd 2/54 and Isd 16. Considering the above results the variety Isd 29, Isd 28 and Isd 20 may be recommended for cultivation in Jamalpur district for higher cane yield.

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