

**UNIVERSITY OF AGRICULTURAL SCIENCES**  
**BENGALURU**



**ANNUAL REPORT**

**2012-13**

**ALL INDIA CO-ORDINATED RESEARCH PROJECT  
ON SUGARCANE**

*Submitted by*

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*Submitted to,*

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**ZONAL AGRICULTURAL RESEARCH STATION**

**VC. Farm, Mandya - 571405**

### AS 42: Evaluation of promising sugarcane genotypes

**Objective:** To workout agronomy of promising sugarcane genotypes from advance varietal trial (AVT)

**Technical program:**

**Genotypes (3)** V<sub>1</sub>: CoSnk 7103      V<sub>2</sub>: Co 7008      V<sub>3</sub>: Co 86032

**Fertilizer doses (3)** F<sub>1</sub>: 75% RDF F<sub>2</sub>: 100% RDF F<sub>3</sub>: 125% RDF  
RDF: 250:100:125 kg NPK ha<sup>-1</sup>.

Design: Factorial RBD (3 X 3 = 9 treatments)

Replication: 3

**Date of planting:** 21.11.2011

**Date of harvest:** 06.01.2013

**Results:**

Table: Influence of AVT genotypes on yield & quality of sugarcane under different level of fertilization

Treatments	Germn. percentage	Cane weight (kg)	Cane length (m)	Cane girth (cm)	NMC ('000 ha <sup>-1</sup> )	Cane yield (MT ha <sup>-1</sup> )	CCS (%)
<b>V: Genotypes</b>							
V <sub>1</sub> : CoSnk 7103	37.16	1.08	1.90	2.49	58.34	63.83	13.93
V <sub>2</sub> : Co 7008	39.66	1.24	2.18	3.08	68.60	88.20	14.02
V <sub>3</sub> : Co 86032	39.73	1.20	2.12	2.90	65.57	86.47	13.90
S.Em±	1.01	0.03	0.05	0.07	1.27	2.13	0.10
CD (p=0.05)	NS	0.10	0.16	0.22	3.80	6.37	NS
<b>Fertilizer levels</b>							
F <sub>1</sub> : 75% RDF	38.53	1.09	1.95	2.62	59.56	74.63	13.79
F <sub>2</sub> : 100% RDF	39.29	1.19	2.12	2.91	66.32	81.42	14.02
F <sub>3</sub> : 125% RDF	38.72	1.25	2.13	2.94	66.63	82.45	14.03
S.Em±	1.01	0.03	0.05	0.07	1.27	2.13	0.10
CD (p=0.05)	NS	0.10	0.16	0.22	3.80	6.37	NS
<b>Interaction</b>							
S.Em±	1.75	0.06	0.09	0.13	2.19	3.68	0.17
CD (p=0.05)	NS	NS	NS	NS	NS	11.04	NS
CV (%)	7.79	8.43	7.62	7.95	5.92	8.02	2.07

**Inference:**

The trial was initiated with promising genotypes of AVT trial (CoSnk 7103, Co 7008 taking Co 86032 as a check variety) under three different fertilizer levels (75%, 100% and 125% RDF). The germination percentage and CCS (%) with different genotypes, fertilizer levels and their interaction didn't varied significantly.

Among the tested genotypes, significantly higher cane yield was recorded with Co 7008 (88.20 MT ha<sup>-1</sup>) followed by Co 86032 (86.47 MT ha<sup>-1</sup>) and was lower with CoSnK 7103 (63.83 MT ha<sup>-1</sup>). Thicker cane with higher cane weight was observed with Co 7008 (3.08 cm and 1.24 kg, respectively) and Co 86032 (2.90 cm and 1.20 kg, respectively). Significantly taller cane (2.18 m) and higher NMC (68.60 thousand ha<sup>-1</sup>) was observed with Co 7008.

Yield and yield attributes of sugarcane varied significantly with different levels of fertilizer application. Application of 100% and 125% RDF recorded significantly higher cane yield (81.42 & 82.45 MT ha<sup>-1</sup>, respectively), number of millable cane (66.32 & 66.63 thousand ha<sup>-1</sup> respectively) and cane weight (1.19 & 1.25 kg, respectively) over application 75% RDF (74.63 MT ha<sup>-1</sup>, 59.56 thousand ha<sup>-1</sup> and 1.09 kg, respectively).

**Summary:** Promising genotypes of AVT trial Co 7008 performed at par with the check variety Co 86032. Recommended dose of fertilizer was sufficient to realize higher cane yield compared with either increase or decrease of 25 per cent of recommended dose.

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**Inference:**

The ratoon initiation for the trial was considered with promising genotypes of AVT trial executed during the previous season (CoSnk 05104, CoSnK 05103, CoVC 99463 taking Co 62175 as a check variety) under three different fertilizer level (75%, 100% and 125% RDF).

Among the tested genotypes, ratoon cane yield was significantly higher with Co 62175 (87.81 MT ha<sup>-1</sup>) followed by CoVC 99463 (86.64 MT ha<sup>-1</sup>) and was lower with CoSnK 05103 (75.59 MT ha<sup>-1</sup>). The germination percentage, cane weight, length and CCS was also at par among the genotypes. Significantly thicker cane (2.71 cm) and was observed with CoSnK 05104 but was on par with CoSnk 05103 (2.69 cm) and CoVC 99463 (2.68 cm). Internodal length was greater with CoSnK 05103 (11.81 cm) and NMC with Co 62175 (72.89 thousand ha<sup>-1</sup>).

The germination percentage and CCS (%) with different fertilizer levels and their interaction didn't varied significantly. Significantly higher cane yield was observed with application of 125 and 100 per cent RDF (86.64 and 85.13 MT ha<sup>-1</sup>, respectively) compared to 75 per cent RDF (73.51 MT ha<sup>-1</sup>). Although higher values of yield attributes viz., cane weight (1.24 kg), length (2.22 m), girth (2.71 cm), intermodal length (11.43 cm), NMC (70.60 thousand ha<sup>-1</sup>) were noticed with 125 per cent RDF, but were at par with application of 100 per cent RDF (1.21, 2.21 m, 2.68 cm, 11.36 cm and 69.62 thousand ha<sup>-1</sup>, respectively) and both were significantly superior over 75 per cent RDF (1.13, 2.05 m, 2.52 cm, 10.42 cm and 64.14 thousand ha<sup>-1</sup>, respectively)

**Summary:** The check genotype Co 62175 proved better followed by CoVC 99463 for ratoonability. Recommended dose of fertilizer was sufficient to realize higher cane yield (85.13 MT ha<sup>-1</sup>) compared with either increase or decrease of 25 per cent of recommended dose.

**AS 64: Response of sugarcane crop to different plant nutrients in varied agro-ecological situation**

**Objectives:** To study the differential response of sugarcane crop to different nutrients

**Technical program**

Design : RBD No. of treatments: 13 No. of replications: 3

Date of Planting: 19.12.2011

Date of harvest: 04.01.2013

**Results:**

Table: Yield & yield attributes of sugarcane as influenced by different treatments

Treatment	Germination (%)	Cane weight (kg)	Cane length (m)	cane girth (cm)	Internode length (cm)	NMC ('000 ha <sup>-1</sup> )	Cane yield (MT ha <sup>-1</sup> )
T <sub>1</sub> Control (No fertilizer)	41.2	0.89	1.71	2.42	9.27	45.03	50.55
T <sub>2</sub> N	37.9	0.97	1.89	2.53	10.60	48.97	54.56
T <sub>3</sub> NP	40.7	1.11	1.93	2.55	11.73	51.53	64.07
T <sub>4</sub> NPK	43.0	1.40	2.05	2.71	13.47	55.40	86.06
T <sub>5</sub> NPK + S	40.9	1.42	2.08	2.71	13.37	54.57	85.99
T <sub>6</sub> NPK + Zn	39.5	1.43	2.07	2.79	13.50	55.13	86.75
T <sub>7</sub> NPK + Fe	40.1	1.44	2.10	2.77	13.43	55.23	85.42
T <sub>8</sub> NPK + Mn	41.4	1.46	2.07	2.72	13.47	54.77	86.17
T <sub>9</sub> NPK + S + Zn	40.5	1.46	2.05	2.70	13.53	53.43	84.75
T <sub>10</sub> NPK + S + Zn + Fe	39.7	1.44	2.07	2.72	13.40	53.47	91.56
T <sub>11</sub> NPK + S + Zn + Fe + Mn	37.6	1.45	2.06	2.79	13.00	55.03	89.93
T <sub>12</sub> Soil test based fertilizer application	39.5	1.48	2.15	2.80	14.10	55.90	93.53
T <sub>13</sub> FYM / CPM	39.6	1.09	1.84	2.50	10.70	49.40	58.51
S.Em±	-	1.9	0.05	0.08	0.09	1.00	1.76
CD (p=0.05)	-	NS	0.15	0.25	0.25	2.92	5.15
CV (%)	-	8.01	6.69	7.29	5.57	13.75	5.78

**Inference:** Nutrients in isolation and different combinations were tried to identify the role of different nutrients. Sugarcane responded to combination of nutrients comprising all the primary nutrients significantly over the one or two primary nutrients only. Higher cane yield was recorded with application of nutrients based on soil test (93.53 MT ha<sup>-1</sup>) which was significantly superior over control (50.55 MT ha<sup>-1</sup>), N alone (54.56 MT ha<sup>-1</sup>) and NP only (64.07 MT ha<sup>-1</sup>),

but was at par with application of all the three primary nutrients in combination with secondary and micro nutrients. Similar trends were also observed in respect of yield attributes.

**Summary:** Sugarcane responded to combination of nutrients comprising all the primary nutrients significantly over N and NP alone.

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**AS 66: Priming of cane node for accelerating germination**

- Objectives:**
- To find out suitable cane node priming technique.
  - To assess the effect of cane node on acceleration of germination.

**Technical program:**

Design: RBD                      No. of replications: 4                      No. of treatments: 6

**Date of Planting:** 28.02.2012                      **Date of harvest:** 05.03.2013

**Results:**

Table: Influence of cane node priming on yield &amp; quality of sugarcane

Treatments	Germ n. percentage	Cane length (m)	Cane girth (cm)	NMC ('000 ha <sup>-1</sup> )	Cane weight (kg)	Cane yield (MT ha <sup>-1</sup> )	Pol (%)
T <sub>1</sub> : Un-primed cane node	12.3	1.99	2.31	26.7	1.04	30.04	17.56
T <sub>2</sub> : Treating cane node in hot water at 50°C for 2 hours	18.0	1.97	2.12	33.3	1.03	34.67	17.63
T <sub>3</sub> : Treating cane node in hot water (50°C) urea solution (3%) for 2 hours	19.3	2.04	2.26	35.2	1.05	38.45	17.60
T <sub>4</sub> : Priming cane node with cattle dung, cattle urine and water in 1:2:5 ratio	24.8	2.10	2.29	45.1	1.06	45.78	17.65
T <sub>5</sub> : Conventional 3-bud sett planting.	45.8	2.14	2.48	90.7	1.18	97.18	17.84
T <sub>6</sub> : Primed and sprouted cane node (Incubated for four days after priming)	33.5	2.12	2.30	64.5	1.15	71.88	17.61
S.Em. <sub>±</sub>	1.0	0.11	0.10	1.8	0.04	2.20	0.12
CD (p=0.05)	2.9	NS	NS	5.6	NS	6.64	NS
CV (%)	7.5	10.57	8.48	7.5	7.64	8.31	1.40

**Inference:** Planting of conventional three eye buded setts recorded significantly higher germination (45.8%), number of millable cane (90.7 thousand ha<sup>-1</sup>), and cane yield (97.18 MT ha<sup>-1</sup>) compared to all other treatments. The cane length, girth and weight were statistically at par among the treatments. The next best treatment was primed and sprouted cane node (Incubated for four days after priming). Un-primed cane node recorded significantly lower germination (12.3%), NMC (26.7 thousand ha<sup>-1</sup>) and cane yield (30.04 MT ha<sup>-1</sup>).

**Summary:** The conventional three budded sett performed superior over all other treatments.



## A. WEATHER CONDITIONS

### 1) ZARS, Mandya

The daily rainfall data recorded at the Centre during the year 2012 is presented in Table -1. An amount of 422.6 mm of annual rainfall distributed over 24 rainy days was recorded at the centre as against the last 39 years (1973-2011) average annual rainfall of 737.9 mm.

Table 1. Daily rainfall of V.C.Farm, Mandya for the year 2012

Date	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	2.2	0	44.2	0
2	0	0	0	0	0	0	0.2	0	0	0	8.2	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	1.2	0	0	8.6
6	0	0	0	0	0	0	0	0	0	0	20	0
7	0	0	0	4.4	0	0	0	0.4	1.4	0	0	0
8	0	0	0	0	0	0	0	0	2.6	0	0	0
9	0	0	0	0.4	0	0	0	2.4	5.4	20.8	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0.4	0	0	0	0
14	0	0	0	0	0	0	0	0	0	12.6	4.6	0
15	0	0	0	0	2.8	0	2.2	0	2.4	15.8	0	0
16	0	0	0	0	19.8	0	5.6	0	0	6.4	0	0
17	0	0	0	0	0	0.6	0	0	0	0	0	0
18	0	0	0	18.6	0	0.6	0	0	0	0	0	0
19	0	0	0	24.8	0	2.2	0	0	0	4.6	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	1.4	0	0	0	0	0
22	0	0	0	0	0	2.2	0	0	0	0	0	0
23	0	0	0	1.4	0	0	0	3.4	0	8.2	2.8	0
24	0	0	0	0	0.2	0	0	26.4	0	0	0	0
25	0	0	0	0	0	0	1.6	0	0	0	0	0
26	0	0	0	12.8	0	0	0	0	0	0	0	0
27	0	0	0	4.2	0	0	0	0	5.4	0	0	0
28	0	0	0	0	0	0	0	0	73	0	0	0
29	0	-	0	1.4	0	2.2	0	0	24.6	0	0	0
30	0	-	0	0	0	0	0	2.2	0	0	0	2.8
31	0	-	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	68	22.8	7.8	11	35.2	118.2	68.4	79.8	11.4
Cumulative total	0	0	0	68	90.8	98.6	109.6	144.8	263	331.4	411.2	422.6
Mean	1.5	4.6	15.8	55.9	93.7	58.9	55.7	76	152.5	152.9	55.8	14.6
% Dev.	-100	-100	-100	21.6	-75.7	-86.8	-80.3	-53.7	-22.5	-55.3	43	-21.9
Rainy days	0	0	0	5	2	0	1	1	5	6	2	2

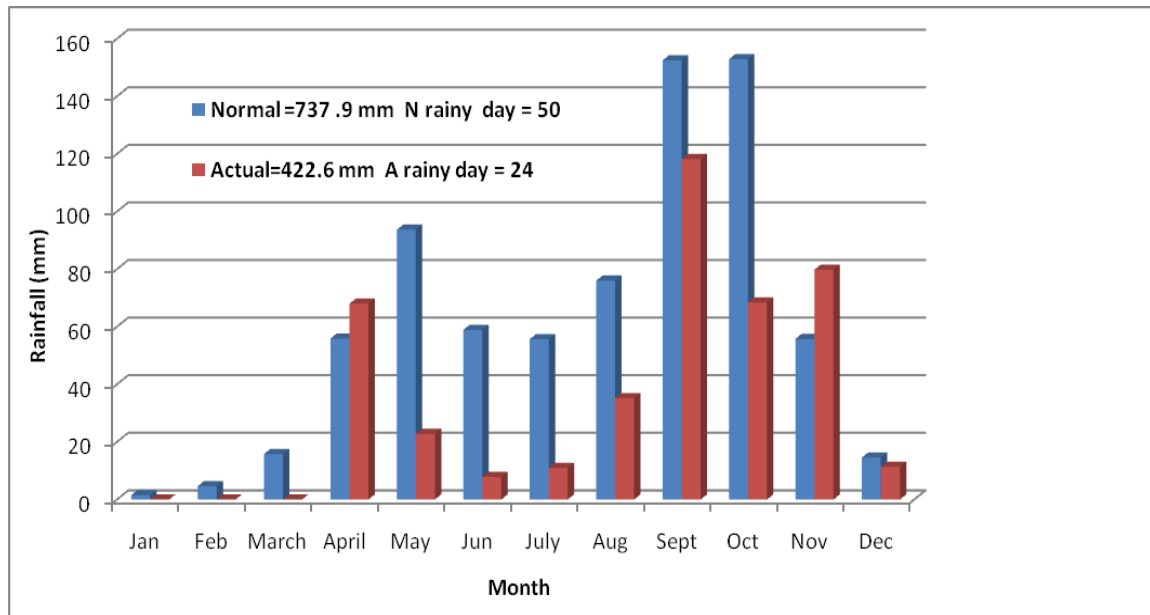


Figure 1. Monthly rainfall during 2012 and normal

The year under consideration has received deficit rainfall to an extent of -42.7 per cent, during crop growth period (S-W monsoon). Among the different months the highest monthly rainfall of 118.2 mm was recorded during September as against the mean of 152.5 mm. All the months recorded deficit rainfall ranging from -21.9 to -100 except April which has received normal rainfall. The highest amount of rainfall received on a single day during the year was 44.2 mm on 1<sup>st</sup> November. The monthly rainfall received during 2012 and normal rainfall is graphically represented in figure 1.

Table -2 Seasonal distribution of rainfall during the year -2012

Seasons	Normal (1973-11)		Actual 2012		(%) deviation
	Amount (mm)	% amount	Amount (mm)	% amount	
Winter (Jan- Feb)	6.1	0.8	0.0	0.0	-100.0
Pre-Monsoon (Mar-May)	165.4	22.4	90.8	21.5	-45.1
South west monsoon (Jun-Sep)	343.1	46.5	172.2	40.7	-49.8
North east monsoon (Oct-Dec)	223.3	30.3	159.6	37.8	-28.5
Total	737.9		422.6		-42.7

The seasonal distribution of rainfall (Table-2) indicated that S-W and N-E monsoon rains were deficit during the year.

### **Monthly mean maximum and minimum temperature (°C)**

April was the hottest month during the year 2012 with a monthly mean maximum of 32.7°C and the monthly mean lowest maximum temperature of 29.7°C which was observed in January 2012. July was the coldest month during the year 2012 with a mean daily minimum temperature of 19.5°C.

### **Mean relative humidity (%)**

October month was the most humid month with the highest monthly mean relative humidity of 74 per cent as against 72 per cent, while the month of May recorded the lowest monthly mean daily relative humidity of 64 per cent.

### **Bright sunshine hours**

The highest and the lowest monthly mean sunshine hours of 9.1 and 2.4 were noticed during the months of March and June respectively.

Table 3: Actual (2012) and normal (1973-2011) values of monthly meteorological parameters at V.C.Farm Mandya

Sl. No.	Weather parameters	ACTUAL/NORMAL	JAN	FEB	MAR.	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1	Total monthly rainfall (mm) (2011)	ACTUAL	0	0	0	68	22.8	7.8	11	35.2	118.2	68.4	79.8	11.4	422.6
	Mean (1973 –2011) (mm)	NORMAL	1.5	4.6	15.8	55.9	93.7	58.9	55.7	76.0	152.5	152.9	55.8	14.6	737.9
	highest event	ACTUAL	0	0	0	24.8	19.0	2.2	5.6	26.4	73.0	20.8	44.2	8.6	
	Dates	ACTUAL	-	--	--	19 <sup>th</sup>	16 <sup>th</sup>	19 <sup>th</sup>	16 <sup>th</sup>	25 <sup>th</sup>	28 <sup>th</sup>	9 <sup>th</sup>	1 <sup>st</sup>	5 <sup>th</sup>	
	Rainy days	ACTUAL	0	0	0	5	2	0	1	1	5	6	2	2	24
	Normal Rainy days	NORMAL	0	0	1	4	5	4	5	6	8	9	5	1	50
2	2012 Avg. daily Max. Temp. (°C) – Mean (1990-2011) daily max.temp.(°C)	ACTUAL	29.7	32.6	31.5	32.7	31.1	31.1	30.7	30.3	31.3	32.2	32.6	32.5	
		NORMAL	29.3	31.2	33.2	32.2	31.5	28.9	29	29.4	29.5	29.3	27.6	27.2	
3	2012Avg. daily Min. Temp.(°C) – Mean (1990-2011) daily min. temp.(°C)	ACTUAL	20.6	21.1	21.3	21.4	20.6	20.1	19.5	20.5	20.8	21.2	21.3	21.7	
		NORMAL	14.4	15.9	18.4	20.3	19.7	19.3	19.8	19.8	19.8	19.4	16.9	14.5	
4	2012 Avg. daily rel. hum. (%) – I (hr) Mean (1990-2011) daily rel. hum. (%)I (hr)	ACTUAL	91	91	90	90	90	90	91	91	91	91	91	91	
		NORMAL	87	85	84	81	81	82	87	88	88	90	84	83	
	2012 Avg. daily rel. hum. (%) – II (hr) Mean (1990-2011) daily rel. hum. (%) II (hr)	ACTUAL	53	49	49	46	38	41	47	53	52	56	52	49	
		NORMAL	41	38	36	40	42	57	58	58	56	56	51	43	
5	2012 Avg. daily bright sunshine (hr) – Mean (1990-2011) daily sunshine hours	ACTUAL	6.9	8.4	9.1	8.8	6.0	2.4	7.4	5.7	6.7	7.7	8.1	6.9	
		NORMAL	8.1	8.7	9.1	8.2	7.9	5.7	5.1	4.9	6.1	5.6	5.7	6.5	

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Date: 21.05.2013

To,

*Dr. V.P. SINGH*  
*The Principal Investigator (Crop Production), AICRP (Sugarcane)*  
*Director of Research,*  
*Rajendra Agricultural University,*  
*Pusa – 848 125 Samastipur Dist, Bihar*

Sir,

Sub: Submission of the annual report 2012-13 – reg.

With reference to the above subject, I am here with submitting the hard copy of the annual report of the trials conducted at Mandya center. The soft copy has already been mailed to your Email. This is for your kind information and needful.

Thanking you

Date: 21.05.2013  
Place: Mandya

Yours faithfully,

(Yogananda, S.B.)