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UNIVERSITY OF AGRICULTURAL SCIENCES

BANGALORE

ALL INDIA CO-ORDINATED RESEARCH PROJECT ON SUGARCANE

RESULTS
CROP IMPROVEMENT

2014-15

Compiled by

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ZONAL AGRICULTURAL RESEARCH STATION
VC. Farm, Mandya - 571405

I. WEATHER REPORT

METEOROLOGICAL DATA FROM APRIL 2014 TO MARCH 2015 OF ZONAL AGRICULTURAL RESEARCH STATION, V.C.FARM, MANDYA FOR THE YEAR 2014-15

Sl. No	Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)	Rainy days	Sunshine hours	Pest / disease occurrence during the month
		Max.	Min.	07.30 hrs	14.30 hrs				
1	April 2014	34.2	19	84	34	20.2	2	5.5	ESB,TSB,YLD
2	May 2014	33.6	19.9	89	39	242.5	10	7.0	ESB,YLD
3	June 2014	32.5	19.1	90	36	53.0	1	5.9	Aphid, ESB,YLD
4	July 2014	30.4	18.6	88	45	72.3	4	4.6	Aphid, YLD
5	Aug 2014	29.4	18.8	90	54	113.8	8	3.5	Wooly Aphid, YLD
6	Sept 2014	29.6	18.5	90	56	141.2	7	5.4	Pyrilla, SWA,YLD
7	Oct 2014	30.3	18.5	91	64	237.3	13	4.9	TSB, Pyrilla, YLD
8	Nov 2014	29.0	16.7	90	51	10.0	1	6.2	INB,YLD
9	Dec 2014	28.5	16.0	90	53	24.0	1	5.5	INB,YLD
10	Jan 2015	27.2	17.2	90	42	0	0	8.2	ESB,YLD
11	Feb 2015	29.2	18.2	85	44	0	0	7.2	ESB, INB,YLD
12	March 2015	30.2	19.0	90	38	0	0	7.6	ESB, TSB,YLD

ESB – Early Sugarcane Borer, TSB – Top Shoot Borer, YLD – Yellow Leaf Disease, INB – Internode Borer,

SWA-Sugarcane wooly Aphid

CROP IMPROVEMENT

A. Zonal Varietal Trials:

Experiment – 1

01.	Title of the experiment	Evaluation of sugarcane entries under early group of Initial Varietal Trial.
02.	Date of planting	16-12-2013
03.	Date of harvest	26-11-2014
04.	Location	Zonal Agricultural Research Station, V.C. Farm, Mandya
05.	Objective	To isolate elite entries under IVT Early for better adaptability, higher cane and sugar yield.
06.	Number of entries	13+3
07.	Plot size	6 M x 6 R x 1.2 M = 43.2 m^2
08.	Design	RCBD
09.	Replication	02
10.	Standards	Co 85004, Co 94008, CoC 671
11.	Fertilizer application	250:100:125 NPK kg/ha
12.	Intercultural operation	3 hoeing and 4 hand weeding
13.	Irrigation	Once in a week depending upon soil condition
14.	Name of the scientists involved	Dr. Nagaraja, T. E., Dr.V.N. Patel, Dr.Thimmegowda, P., Mr. Ravindrababu, B. T. & Ms. Sunitha,B.P.

Table 1: Mean data of IVT- Early entries under crop improvement programme of AICRP (Sugarcane)-2014-15

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Pol % Cane (10m)	Extraction % (10m)	Fiber % (10m)	NMC at 10m ('000/ha)
1	Co 11001	11.00	88.77	19.00	17.56	92.87	12.43	13.31	52.86	15.01	67.08
2	Co 11004	11.87	86.11	20.75	19.37	93.82	13.76	14.56	53.16	13.95	76.75
3	Co 11016	8.50	65.05	20.00	18.46	92.81	13.06	14.25	56.30	12.84	66.58
4	Co 11017	10.30	76.74	20.00	18.82	94.62	13.43	14.19	53.31	14.08	73.25
5	Co 11018	13.92	100.58	20.50	19.39	95.06	13.86	14.43	51.64	13.25	65.33
6	CoM 11081	8.75	70.02	19.50	17.78	91.72	12.50	13.52	55.98	13.92	69.92
7	CoM 11082	7.74	57.06	20.00	18.94	95.22	13.55	14.55	55.05	13.19	56.00
8	CoM 11083	10.32	83.10	19.00	17.57	92.99	12.44	13.28	56.27	13.97	60.67
9	CoM 11084	11.49	91.55	19.50	17.77	91.60	12.50	13.31	55.00	15.09	86.08
10	CoN 11071	6.45	54.40	18.50	16.87	91.75	11.87	12.90	55.59	14.03	63.58
11	CoN 11072	9.35	72.22	20.00	18.34	92.21	12.94	13.93	54.08	15.02	67.83
12	CoT 11366	8.39	70.83	19.00	16.96	89.78	11.82	13.16	58.75	13.08	58.58
13	PI 11131	6.88	54.40	19.50	17.89	92.20	12.62	13.40	54.08	14.27	52.33
	Standards										
1	CoC 671	6.74	50.58	20.00	18.70	94.02	13.30	13.85	54.42	15.92	55.67
2	Co 94008	9.04	71.30	19.00	17.81	94.28	12.69	13.59	55.84	14.37	56.08
3	Co 85004	7.27	53.59	20.00	18.94	95.22	13.55	14.30	54.21	13.25	84.92
	CD at 5%	2.18	13.64	1.18	NS	NS	NS	0.98	2.79	1.27	21.74
	CV(%)	13.84	11.17	2.82	4.01	2.03	4.71	4.45	3.18	5.62	13.12

IVT Early (Contd...)

Sl. No.	Clone	Stalk Length (cm)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (8 m)	Sucrose % (8 m)	Purity % (8 m)	CCS % (8 m)	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 11001	2.40	3.14	1.48	18.00	16.42	92.51	11.60	71.98	40.50
2	Co 11004	2.44	2.86	1.19	17.00	15.03	89.70	10.46	130.25	51.58
3	Co 11016	2.31	3.15	1.39	16.50	14.56	89.43	10.14	93.60	43.63
4	Co 11017	2.31	3.22	1.35	15.00	11.82	80.14	7.77	113.69	46.99
5	Co 11018	2.25	2.96	1.27	19.50	18.25	94.76	13.03	118.80	45.16
6	CoM 11081	2.10	3.07	1.30	18.00	15.81	88.81	13.03	107.72	54.14
7	CoM 11082	2.40	2.99	1.31	19.50	17.89	92.94	12.66	87.11	39.44
8	CoM 11083	2.61	3.15	1.47	16.25	14.33	89.30	9.97	113.06	48.85
9	CoM 11084	2.48	2.92	1.05	16.75	14.03	84.17	9.52	139.50	45.01
10	CoN 11071	1.89	2.97	1.00	15.50	12.17	79.68	7.98	108.80	49.27
11	CoN 11072	2.40	3.07	1.36	17.75	15.71	89.69	10.94	106.21	49.01
12	CoT 11366	1.93	3.15	1.28	17.00	14.78	88.24	10.21	110.67	49.22
13	PI 11131	2.05	3.12	1.43	17.25	15.01	88.21	10.37	91.30	37.04
	Standards									
1	CoC 671	2.32	3.18	1.65	19.50	17.41	90.38	12.17	91.96	49.30
2	Co 94008	2.12	3.06	1.39	15.50	13.64	89.38	9.48	112.85	49.13
3	Co 85004	2.35	2.69	1.01	19.50	17.90	93.00	12.67	106.12	46.15
	CD at 5%	0.33	0.38	NS	2.23	3.47	10.78	2.94	17.22	NS
	CV(%)	5.89	5.05	16.61	6.02	10.64	5.70	13.00	9.93	10.70

Inferences: Totally 13 test entries and 3 standards were included in the trail. Co 11018 was the best performer which produced 100.58 t/ha of cane yield and 13.92 t/ha of sugar yield followed by CoM 11084 (91.55t/ha& 11.49 t/ha of cane yield and sugar yield, respectively) compared to the better standard Co 94008 which produced 71.30 t/ha cane yield and 9.04 t/ha sugar yield.

Experiment – 2

01.	Title of the experiment	**Advanced Varietal Trial – Early I Plant**
02.	Date of planting	20-01-2014
03.	Date of harvest	10-12-2014
04.	Location	Zonal Agricultural Research Station, V.C.Farm, Mandya
05.	Objective	To identify elite entries under AVT Early I PC for higher cane and sugar yield
06.	No. of entries (3)	Co 09004, Co 09007, and CoN 09072
07.	Plot size	6 M x 8 R x 1.2 M = 57.6 m^2
08.	Design	RCBD
09.	Replication	04
10.	Standards	Co 85004, Co 94008 and CoC 671
11.	Fertilizer application	250:100:125 NPK kg/ha
12.	Intercultural operation	3 hoeing and 4 hand weeding
13.	Irrigation	Once in a week depending upon soil Condition
14.	Name of the scientists involved	Dr. Nagaraja, T. E., Dr.V.N. Patel, Dr.Thimmegowda, P, Mr. Ravindrababu, B. T. & Ms. Sunitha,B.P.

Table 2: Mean data of AVT – Early I Plant entries under crop improvement programme of AICRP (Sugarcane)

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Pol % cane (10m)	Extraction % (10m)	Fibre % (10m)	NMC at 10m ('000/ha)
1	Co09004	11.49	85.72	20.38	19.15	94.53	13.65	14.10	55.01	13.76	62.34
2	Co09007	8.57	69.79	18.38	17.20	94.71	12.28	13.20	57.48	13.31	60.81
3	CoN09072	7.41	53.65	20.00	19.24	96.01	13.81	14.54	53.96	14.30	65.09
1	CoC 671	7.92	58.03	20.25	19.10	94.14	13.60	14.44	54.89	13.73	57.63
2	Co 94008	5.35	43.36	18.50	17.29	93.19	12.26	13.33	58.93	14.78	63.31
3	Co 85004	10.15	75.61	19.88	18.83	94.52	13.43	14.14	54.18	15.44	65.22
	CD at 5%	1.24	7.56	0.71	1.02	NS	0.87	0.64	NS	1.18	4.84
	CV(%)	9.67	7.79	2.43	3.68	2.05	4.39	3.06	4.69	5.50	5.15

AVT – Early I plant (Contd…)

Sl. No.	Clone	Stalk Length (cm)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (8 m)	Sucrose % (8 m)	Purity % (8 m)	CCS % (8 m)	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co09004	2.00	2.87	1.13	20.25	18.92	93.25	13.41	113.79	33.77
2	Co09007	1.69	3.04	0.97	18.13	17.19	94.11	12.23	107.92	33.12
3	CoN09072	1.72	2.71	0.81	17.63	16.39	93.57	11.63	99.35	33.85
1	CoC 671	1.47	3.13	0.89	18.75	17.16	92.06	12.09	97.80	54.82
2	Co 94008	1.62	2.96	0.98	18.38	16.58	90.75	11.61	66.37	52.26
3	Co 85004	1.70	2.75	0.75	19.50	18.07	93.18	12.81	133.75	38.89
	CD at 5%	6.37	0.27	0.16	0.99	0.96	2.26	0.73	12.82	14.10
	CV (%)	0.16	6.06	11.83	3.47	3.65	1.61	3.92	8.25	22.75

Inferences: Only three test entries and 3 standards were evaluated in 4 replications. No entry was found good in performance since severe infestation due to Yellow Leaf Disease. **.** However Co 09004 was good among six entries tested. Sucrose % Juice was 19.24 and CCS % 13.81 was found good in CoN09072 as compared to the better check Co 94008.

Experiment- 3

01.	Title of the experiment	Evaluation of mid late sugarcane entries under Initial Varietal Trial
02.	Date of planting	13-12-2013
03.	Date of harvest	09-01-2015
04.	Location	Zonal Agricultural Research Station, V.C.Farm, Mandya
05.	Objective	To identify elite entries under IVT ML for higher cane and sugar yield.
06.	Number of entries	14+2
07.	Plot size	6 M x 6R x 1.2M = 43.2 m^2
08.	Design	RCBD
09.	Replication	02
10.	Standards	Co 86032 and Co 99004
11.	Fertilizer application	250:100:125 NPK kg/ha
12.	Intercultural operation	3 hoeing and 4 hand weeding
13.	Irrigation	Once in a week depending upon soil condition
14.	Name of the scientists involved	Dr. Nagaraja, T. E., Dr.V.N. Patel, Dr.Thimmegowda, P., Mr. Ravindrababu, B. T. & Ms. Sunitha,B.P.

Table 3: Mean data of IVT- Mid late entries under crop improvement programme of AICRP (Sugarcane) -2014-15

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (12 m)	Sucrose % (12m)	Purity % (12m)	CCS % (12m)	Pol % Cane (12m)	Extraction %(12m)	Fiber% (12m)	NMC at 10m ('000/ha)
1	Co 11005	11.64	91.55	19.00	17.81	94.24	12.68	13.37	53.60	14.90	69.08
2	Co 11007	13.98	103.70	19.50	18.74	96.64	13.49	14.28	54.60	13.81	61.75
3	Co 11012	15.19	106.83	21.50	20.03	93.64	14.22	15.21	57.04	14.05	70.83
4	Co 11019	17.05	116.55	21.00	20.30	97.24	14.64	15.27	56.69	14.68	79.00
5	Co 11020	15.78	111.00	21.50	20.02	93.59	14.21	14.97	58.08	15.21	70.58
6	Co 11021	13.33	103.24	19.50	18.25	94.10	12.99	13.79	53.11	14.40	71.83
7	Co 11022	13.31	95.02	20.75	19.61	94.99	14.01	14.93	58.94	13.85	81.33
8	Co 11023	9.32	70.49	19.50	18.50	95.37	13.24	13.81	55.72	15.31	64.83
9	Co 11024	11.79	96.30	18.50	17.24	93.76	12.24	13.00	55.25	14.56	68.92
10	CoM 11085	13.55	100.00	20.00	18.94	95.22	13.55	14.09	57.19	15.60	74.25
11	CoM 11086	11.42	84.26	20.00	18.94	95.22	13.55	14.37	55.93	14.13	86.25
12	CoM 11087	11.74	90.51	20.25	18.43	91.48	12.95	14.03	55.21	13.87	80.33
13	CoN 11073	15.73	129.75	18.50	17.12	93.05	12.12	12.95	53.29	14.28	87.00
14	CoN 11074	10.96	96.88	17.25	15.98	93.20	11.33	12.27	55.23	13.20	63.08
	Standards										
1	Co 86032	15.97	117.13	19.50	18.86	97.21	13.61	14.19	54.73	14.75	76.67
2	Co 99004	16.05	114.93	21.25	19.68	93.09	13.94	14.97	59.82	13.91	72.33
	CD at 5%	4.12	19.04	1.26	1.27	2.79	0.98	1.15	5.78	2.20	8.19
	CV(%)	22.51	12.22	2.97	3.21	1.38	3.46	5.05	6.47	9.49	4.45

IVT Mid-late (Contd...)

Sl. No.	Clone	Stalk Length (cm)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 11005	1.96	2.57	0.99	19.00	18.41	82.07	12.13	99.82	52.78
2	Co 11007	2.16	3.13	0.55	17.00	14.77	70.70	8.70	114.71	45.37
3	Co 11012	2.22	3.08	1.14	21.00	19.10	84.60	11.70	96.45	23.15
4	Co 11019	2.51	3.02	1.42	19.25	17.91	80.60	12.84	83.37	32.41
5	Co 11020	2.42	3.19	1.50	20.25	18.92	82.61	12.58	74.87	35.88
6	Co 11021	2.39	2.59	1.21	18.00	16.54	78.17	10.51	80.13	62.85
7	Co 11022	1.82	2.60	0.82	19.25	16.56	75.54	10.31	114.78	44.68
8	Co 11023	1.68	2.94	1.11	17.50	15.60	73.26	9.48	100.16	40.63
9	Co 11024	1.81	3.08	1.18	18.50	16.99	80.12	11.04	79.78	54.40
10	CoM 11085	1.94	3.17	1.20	19.00	18.42	83.03	12.21	78.03	41.90
11	CoM 11086	2.30	2.79	1.16	19.00	17.93	83.94	11.93	108.96	64.00
12	CoM 11087	2.08	2.75	0.98	17.25	16.11	76.93	10.14	101.41	39.24
13	CoN 11073	2.25	2.94	1.14	17.75	15.95	75.89	9.91	122.15	46.99
14	CoN 11074	2.04	2.83	1.62	19.00	16.84	77.01	10.67	90.81	47.92
	Standards									
1	Co 86032	1.85	2.44	0.96	19.75	18.24	81.12	11.95	141.73	36.57
2	Co 99004	2.02	2.32	1.36	20.50	19.26	85.64	13.00	105.32	52.55
	CD at 5%	0.53	1.13	0.32	2.02	2.29	9.59	2.32	15.20	12.64
	CV(%)	10.21	15.93	11.31	5.02	6.19	5.66	9.73	7.17	5.70

Inferences: CoN 11073 performed better in terms of cane yield (129.75 t/ha) among the 16 test entries when compared to all the standards included in the trail. Highest sugar yield of 17.05 t/ha was evident for Co 11019 against 16.05 t/ha sugar yield produced by the better standard Co 99004. Sucrose % juice (20.30) and CCS % (14.64) were also more in Co 11019.

STATUS REPORT OF PREVIOUS YEARS CROSSES

Table 7: Status report of the crosses made in the previous years

YEAR	No. of Crosses BPC+GC+PC	Number of seedlings obtained	C-I	C-II	C-III	Accepted for ZVT
2014	51(34+05+12)	5795	230			
2012	560GC	560	88	14		
2011	43(24+07+12)	5182	101	81	4	
2010	67(33+22+12)	12063	8923	148	71	VCF 0604-04 accepted for ZVT
2009	71(32+29+10)	11786	341	128	29	VCF 09-64 accepted for ZVT
2008	70 (29+24+17)	18075	322	98	62	RYT=40 clones
2007	38 (25+10+03)	11429	223	80	26	PYT=24clones
2006	29 (9+20+0)	8782	161	81	23	I clone for ZVT
2005	55 (15+40+10)	10216	194	63	42	4 Clones for IVT ML 2011-12

BPC-Biparental cross; GC-General Cross; PC-Poly Cross; C-I,C-II & C-III, Clonal I,II & III stages, respectively.

Isolated desirable clones maintained for further evaluation are given below.

Year of Fluff raised	No. of isolated Clones
Fluff 2007	5 elite clones
Fluff 2008	2 elite clones
Fluff 2009	16 elite clones
Fluff 2010	25 elite clones
Fluff 2011	4 elite clones
Fluff 2012	14 elite clones
Fluff 2014	230 elite clones

FLUFF 2015

Centre: ZARS, VC Farm, Mandya **Date of Sowing: 15.04.2015**

Sl. No.	CROSS		Quantity sown (gm)	Total No. of Seedlings Obtained	No. of Germinants per gram
STATION CROSSES					
	Female	Male			
1.	Co 8371	Co 62198	23.5	145.0	6.17
2.	Co 86011	CoT 8201	19.5	652.0	33.44
3.	CoA 7602	Co 62198	12.0	56.0	4.67
4.	Co 86032	Co 94008	38.0	102.0	2.68
5.	Co 8371	Co 94008	18.5	675.0	36.49
6.	CoC 671	CoT 8201	22.0	15.0	0.68
7.	Co 8013	ISH 229	24.0	51.0	2.13
8.	Co 87044	Co 94008	28.0	95.0	3.39
9.	Co 06032	CoN 91132	13.5	28.0	2.07
10.	Co 86032	Co 8339	24.5	27.0	1.10
11.	Co 86032	ISH 229	14.5	43.0	2.97
12	CoC 671	Co 94008	32.0	12.0	0.38
13	Co 86032	Co 86011	23.0	286.0	12.43
14	CoC 671	CoS 8436	31.0	55.0	1.77
15	Co 86032	Co 85019	26.0	31.0	1.19
16	Co 86032	Co 62198	34.0	302.0	8.88
17	Co 86032	Co 86249	18.5	9.0	0.49
18	Co 87044	Co 86249	11.5	70.0	6.09
19	Co 86002	ISH 169	17.0	50.0	2.94
	Total		**431.0**	**2704.0**	**130.0**
ZONAL CROSSES					
1	Co 86002	Co 1148	9.0	279	31.0
2	Co 0312	Co 0209	6.0	8	1.3
3	Co 8371	Co 99006	14.5	21	1.4
4	Co 8371	Co 86011	12.5	38	3.0
5	Co 8213	Co 86011	19.5	27	1.4
6	ISH 41	Co 94008	10.0	20	2.0
7	Co 94012	Co 94008	15.0	23	1.5
8	CoV 94101	Co 97015	7.0	24	3.4
9	CoC 671	CoT 8201	9.0	9	1.0
10	CoC 671	Co 94008	11.5	12	1.0
11	Co 86032	Co 94005	13.5	46	3.4

12	Co 86032	Co 86250	8.0	12	1.5
13	CoM 0265	CoC 671	7.5	0	0.0
14	CoM 0265	Co 99006	7.5	18	2.4
	TOTAL		**150.5**	**537**	**54.5**

POLY CROSSES

Cross No	Female parent	Poly cross pollen parents	Qty of fluff (g)	Total No. of Seedlings Obtained	No. of Germinants per gram
1	CoM 0265	*Co 775* *Co 99006* *Co 86011* *ISH 69* *Co 94008* *CoT 8201* *CoV 92102* *Co 93009*	13.5	24	1.8
2	ISH 100		21.5	449	20.9
3	Co 94012		35.5	15	0.4
4	Co 85002		39.0	1652	42.4
5	CoA 7602		29.0	82	2.8
6	86V46		25.5	562	22.0
7	CoC 671		30.0	0	0.0
8	CP 52-68		10.0	142	14.2
9	Co 2000-10		36.5	20	0.5
10	CoC 90063		43.5	11	0.3
11	Co 7201		23.5	486	20.7
12	Co 8371		40.5	1745	43.1
13	Cov 89101		58.5	1818	31.1
	Total		**406.5**	7006	200.2

Abstract of the crosses

Crosses	**No. of crosses**	**Quantity sown (gm)**	**Total No. of Seedlings Obtained**	**No. of Germinates per gram**
Station crosses	19	431.0	2704	6.27
Zonal crosses	14	150.5	537	3.57
Poly crosses	13	406.5	7006	17.23
Grand Total	**46**	**988.0**	**10247**	**27.08**

General Remarks: Infestation due to YLD for many of the entries was noticed. Co 86032 was found more susceptible than other clones.