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ANNUAL RESEARCH REPORT

ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE

(AGRONOMY)

(2016 - 2017)

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RESEARCH SCIENTIST (SUGARCANE)

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ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE

CENTRE: NAVSARI

ANNUAL REPORT 2016-17

1	Project No.	AS 68
2	Title	Impact of integrated application of organics and inorganics in improving soil health and sugarcane (2nd Ratoon Crop)
3	Objectives	To study the differential response of sugarcane crop to different nutrients
4	Details of the treatment	➢ T_1: Application of trash at 10 tonnes ha^{-1} + 50 % RDF ➢ T_2: Application of trash at 10 tonnes ha^{-1} + 100 % RDF ➢ T_3: Application of trash at 10 tonnes ha^{-1} + soil test basis (NPK application) ➢ T_4: Application of FYM @ 20 tonnes ha^{-1} + 50 % RDF (inorganic source) ➢ T_5: Application of FYM @20 tonnes ha^{-1} + 100 % RDF (inorganic source) ➢ T_6: Application of FYM @20 tonnes ha^{-1} + inorganic nutrient application based on soil test (NPK application) ➢ T_7: Application of FYM @10 tonnes ha^{-1} +biofertilizer (*Acetobacter* + PSB) + 50 % RDF ➢ T_8: Application of FYM/Compost @10 tonnes ha^{-1} +biofertilizer (*Acetobacter* + PSB) + 100 % RDF ➢ T_9: Application of FYM/Compost @10 tonnes ha^{-1}+ biofertilizer (*Acetobacter* + PSB) + soil test basis (NPK application) ➢ Date of Ratooning : 30-01-2016 ➢ Variety : CoN 05071 ➢ Spacing : 90 cm ➢ Seed rate : Ratoon crop ➢ Fertilizer applied : As per treatment ➢ Recommended dose : 300-62.5-125 kg NPK ha^{-1}

		Nutrient **Basal** **Top dressing** N 25 % 75% (In 2 splits 50 & 25 % of RDN) P 100% - K 100% - ➢ Date of harvesting : 02-02-2017
5	Design	RBD
6	Replications	Three
7	Plot size	➢ Gross : 6.00 m x 5.40 m ➢ Net : 4.00 m x 3.6 m
8	Climatic parameters	Meteorological observations recorded at Main Sugarcane Research Station, NAU, Navsari from Oct. 2015 to Feb. 2017.

Sr. No.	Month	Temp.^{0}c.		Relative humidity		Rainfall (mm)	Rainy days
		Max.	Min.	A.M.	P.M.		
1	Dec. 2015	31.4	13.6	71.3	27.9	0	0
2	Jan. 2016	30.5	11.8	81.4	29.5	0	0
3	Feb. 2016	30.3	13.8	85.4	33.9	0	0
4	Mar. 2016	35.5	18.7	85.7	29.5	2.0	1
5	April 2016	35.6	22.1	82.4	39.9	0.0	0.0
6	May 2016	34.4	26.7	82.8	58.2	0.0	0.0
7	June 2016	33.8	27.3	84.7	71.5	91.0	3.0
8	July 2016	29.7	24.8	93.6	83.4	497.0	20.0
9	Aug. 2016	29.7	24.9	91.5	79.5	196.0	15.0
10	Sept 2016	30.1	23.6	96.6	76.9	529.0	13.0
11	Oct. 2016	32.0	20.5	90.0	58.7	96.0	5.0
12	Nov 2016	33.0	14.5	74.5	28.9	0.0	0.0
13	Dec. 2016	32.1	13.6	72.6	28.5	0.0	0.0
14	Jan. 2017	30.7	13.4	80.9	32.8	0.0	0.0
15	Feb. 2017	31.2	14.4	69.1	25.9	0.0	0.0
	Total					**1411**	**57**

The average maximum temperature was in April-2016 (35.6 ^{0}C) and minimum temperature in January-2016 (11.8 ^{0}C). The monsoon commenced in 3rd week of June-2016 and was terminated in 1st week of October-2016. The total rainfall of 1411 mm was received in 57 rainy days. The highest rainfall of 529.00 mm was received in 13 rainy days during September 2016 followed by July 2016 (497 mm) and August (196 mm). The weather condition remained favorable for sugarcane growth and normal crop was harvested due to no severe incidence of major diseases and pests.

9	Soil health (Initial)	➢ Organic carbon : 0.24 % ➢ Available N : 301 kg ha^{-1} ➢ Available P_2O_5 : 83.84 kg ha^{-1} ➢ Available K_2O : 282 kg ha^{-1}
10	Summary of results:	The data pertaining to initial soil fertility status, growth, yield parameters and after harvest soil status are given in table AS 68. 1 to 4. Significantly higher numbers of tillers were recorded with application of FYM @10 tonnes ha^{-1}+biofertilizer *Acetobacter* + *PSB*) + soil test basis (NPK application) (T_9) over application of trash at 10 tonnes ha^{-1} + 50 % RDF (T_1). However it remained at par with T_6 at 120 & 150 DAP. NMC (100.22 000 ha^{-1}) was recorded significantly higher with treatment T_9 over T_1 and at par with T_3, T_6 and T_7. Millable cane length (249.29 cm) was significantly highest with T_9 over T_1 however it remained at par with almost all the treatments except T_4 and T_7. Cane diameter was not significantly influenced due to different treatments. Significantly highest single cane weight was observed with T_9 and remained at par with the treatment T_5 and T_6. Cane yield (117.59 t ha^{-1}) was recorded significantly highest with T_9 over T_1 and remained at par with T_3, T_6 and T_8. CCS yield was significantly influenced due to various nutrient management treatments. Various quality parameters were not significantly influenced due to different nutrient management treatments except purity % at 10 month. Almost, all the treatment round equally effective over T_5. While at 12 month, quality parameters were not significantly influenced due to different treatments. There was no significant difference observed due to various inorganic and organic treatments on soil pH, EC (1:2.5) dsm^{-1}, available K_2O and BD g/cc. Available nitrogen recorded significantly highest with T_8 over T_1 and T_2 and remained at par with all the treatments while available phosphorus was also recorded highest with T_8 and remained at par with T_1 and T_4.

Trial series: AS-68 Impact of integrated application of organics and inorganics in improving soil health and sugarcane

Table AS 68. 1: Initial Soil Analysis: At first plant crop

Parameter	**Soil value**
pH (1:10)	8.67
EC (1:10) dsm^{-1}	0.28
Organic carbon (%)	0.24
Available N (kg ha^{-1})	301
Available P_2O_5 (kg ha^{-1})	83.84
Available K_2O (kg ha^{-1})	282
Bulk density (Mg M^{-3})	1.22
Infiltration rate (cm hr^{-1})	1

Application of Soil test based fertilizer:

RDF-300-62.5-125 kg NPK ha^{-1} for 2nd ratoon crop

Treatment	**Available N (kg ha^{-1})**	**Available P_2O_5 (kg ha^{-1})**	**Available K_2O (kg ha^{-1})**
T_3	212.00	59.00	570.00
T_6	244.67	57.33	498.66
T_9	238.00	66.33	585.00

1. N - Increase by 25 % i.e. 375 kg N ha^{-1}
2. P - Decrease RDP by 50 % i.e. apply 31.25 kg P_2O_5 ha^{-1}
3. K - Decrease RDK by 50 % i.e. apply 62.5 kg K_2O ha^{-1}

Table AS 68.2 Growth and yield parameters of sugarcane as influenced by different organic and inorganic treatments

Treatment	No. of tillers at 120 DAP (000 ha^{-1})	No. of tillers at 150 DAP (000 ha^{-1})	Number of Millable cane at harvest (000 ha^{-1})	Millable cane length (cm) at harvest	Cane diameter (cm) at harvest	Single cane weight (kg)	Cane yield (t ha^{-1})	CCS yield (t ha^{-1}) at harvest
T_1	116.47	120.08	74.28	209.01	2.46	1.19	88.34	11.59
T_2	119.51	124.12	86.54	222.32	2.53	1.26	100.19	13.58
T_3	141.65	143.33	88.96	235.88	2.57	1.15	105.64	13.52
T_4	128.33	132.31	84.93	192.71	2.50	1.34	97.22	13.22
T_5	117.49	121.47	87.14	236.05	2.50	1.42	101.82	13.62
T_6	143.92	148.28	96.44	240.89	2.45	1.45	114.13	16.14
T_7	126.77	130.94	90.19	205.68	2.53	1.11	101.39	13.56
T_8	121.19	125.71	86.05	225.67	2.55	1.05	111.57	14.49
T_9	158.95	166.26	100.22	249.29	2.59	1.56	117.59	15.07
S.Em ±	6.81	6.83	4.06	11.52	0.09	0.07	5.23	0.85
C.D.at 5%	20.42	20.48	12.18	34.53	NS	0.21	15.67	NS
C.V.%	9.04	8.78	7.97	8.90	5.95	9.56	8.69	10.62

Table AS 68.3 Juice quality parameters of sugarcane as influenced by different organic and inorganic treatments

Treatment	At 10 month						At 12 month					
	Brix	CCS %	Pol % juice	Purity %	Pol % cane	Fibre %	Brix	CCS %	Pol % juice	Purity %	Pol % cane	Fibre %
T_1	17.71	10.44	15.28	86.30	11.63	13.89	20.40	13.09	18.65	91.38	14.14	14.19
T_2	18.22	10.71	15.58	85.51	11.87	13.77	21.20	13.54	19.12	90.22	14.44	14.49
T_3	18.08	10.49	15.48	85.57	11.79	13.84	20.17	12.73	18.55	92.03	14.04	14.31
T_4	17.90	10.61	15.56	86.92	11.86	13.79	21.43	13.60	19.10	89.12	14.47	14.24
T_5	17.29	9.81	14.60	84.47	11.11	13.90	21.00	13.34	19.28	91.88	14.60	14.30
T_6	17.61	10.63	15.29	86.84	11.65	13.80	21.83	14.18	19.76	90.52	14.96	14.28
T_7	17.42	10.08	14.89	85.47	11.33	13.87	20.90	13.38	19.37	92.66	14.64	14.44
T_8	17.77	10.56	15.44	86.86	11.74	13.98	20.43	13.02	18.40	90.08	13.90	14.45
T_9	17.90	10.61	15.47	86.42	11.78	13.85	20.70	12.86	18.78	90.74	14.18	14.47
S.Em ±	0.38	0.40	0.35	0.50	0.26	0.18	0.69	0.58	0.58	.99	0.44	0.21
C.D.at 5%	NS	NS	NS	1.51	NS	NS	NS	NS	NS	NS	NS	NS
C.V.%	3.70	6.79	3.92	1.01	3.94	2.27	5.73	7.61	5.32	1.88	5.33	2.55

Table AS 68.4: Soil properties after harvest of crop as influenced by different organic and inorganic treatments

Treatment	pH	EC (1:2.5) dsm^{-1}	OC%	Available N ($kg\ ha^{-1}$)	Available P_2O_5 ($kg\ ha^{-1}$)	Available K_2O ($kg\ ha^{-1}$)	BD ($g\ cc^{-1}$)
T_1	7.87	0.87	0.82	138.67	101.33	722.33	1.61
T_2	8.00	0.57	0.79	153.67	86.67	660.33	1.61
T_3	7.96	0.73	0.82	164.00	84.67	690.00	1.64
T_4	8.05	0.58	0.74	158.33	106.33	771.00	1.65
T_5	8.03	0.66	0.78	155.33	87.33	784.67a	1.61
T_6	7.97	0.72	0.76	161.33	75.00	619.33	1.61
T_7	7.96	0.77	0.71	162.67	65.67	671.33	1.61
T_8	8.01	0.69	0.69	168.00	111.00	772.00	1.61
T_9	8.00	0.74	0.71	166.33	89.33	733.33	1.60
S.Em ±	0.04	0.06	0.05	4.50	5.84	79.33	0.02
C.D.at 5%	NS	NS	NS	13.49	17.50	NS	NS
C.V.%	0.77	15.28	10.88	4.91	11.27	19.25	2.04
Initial	8.67	0.280	0.240	301	83.84	282	1.22

1	Project No.	AS 68
2	Title	Impact of integrated application of organics and inorganics in improving soil health and sugarcane (2^{nd} Plant Crop)
3	Objectives	To study the differential response of sugarcane crop to different nutrients
4	Details of the treatment	➢ T_1: No organic + 50 % RDF ➢ T_2: No organic + 100 % RDF ➢ T_3: No organic + Soil test based recommendation ➢ T_4: Application of FYM @ 20 t ha^{-1} + 50 % RDF (inorganic source) ➢ T_5: Application of FYM @20 t ha^{-1} + 100 % RDF (inorganic source) ➢ T_6: Application of FYM @20 t ha^{-1} + inorganic nutrient application based on soil test (rating chart) ➢ T_7: Application of FYM @10 t ha^{-1} +biofertilizer (*Acetobacter* + *PSB*) + 50 % RDF ➢ T_8: Application of FYM @10 t ha^{-1} +biofertilizer (*Acetobacter* + *PSB*) + 100 % RDF ➢ T_9: Application of FYM @10 t ha^{-1} +biofertilizer (*Acetobacter* + *PSB*) + soil test basis (NPK application) ➢ Date of Planting : 07-12-2015 ➢ Variety : CoN 05071 ➢ Spacing : 90 cm ➢ Seed rate : 50000 two eye bud sett ➢ Fertilizer applied : As per treatment ➢ Recommended dose : 250-125-125 kg NPK ha^{-1} **Nutrient** **Basal** **Top dressing** N 15 % 85% (In 3 splits 30,20 & 35 % of RDN) P 100% - K 100% - ➢ Date of harvesting : 09-12-2016
5	Design	RBD

6	Replications	Three
7	Plot size	➢ Gross : 6.00 m x 5.40 m ➢ Net : 4.00 m x 3.6 m
8	Climatic parameters	Given in project no. AS 68 (2nd Ratoon crop)
9	Soil health (Initial)	➢ Organic carbon : 0.49% ➢ Available N : 359 kg ha^{-1} ➢ Available P_2O_5 : 23.11 kg ha^{-1} ➢ Available K_2O : 358 kg ha^{-1}
10	Summary of results:	The data pertaining to initial soil fertility status, growth, yield parameters and after harvest soil status are given in table AS 68. 1 to 4. Significantly higher germination % was recorded with application of FYM/Compost@10 tonnes ha^{-1}+biofertilizer (*Azotobacter / Acetobacter + PSB*) + soil test basis (NPK application) (T_9) over application of trash at 10 tonnes ha^{-1} + 50 % RDF (T_1) at 30 and 45 DAP however it remained at par with T_6 at 30, 45 and DAP. Significantly higher numbers of tillers were recorded with treatment T_9 at 120 & 150 DAP over T_1 and remained at par with T_3 and T_6. NMC (107.70 000 ha^{-1}) was recorded significantly higher with treatment T_9 over T_1 and at par with T_3, T_5, T_6, T_7 and T_8. Millable cane length and diameter was not significantly influenced due to various treatments. Significantly highest single cane weight (1.36 kg) was observed with T_9 over T_1 and remained at par with T_6. Cane (132.71 t ha^{-1}) and CCS (17.78 t ha^{-1}) yield was recorded significantly highest with T_9 over T_1 however cane yield remained at par with T_6 while CCS yield remained at par with T_3 and T_6. Various quality parameters were not influenced significantly due to different nutrient management treatments at 10 month and 12 month. There was no significant difference observed due to various inorganic and organic treatments on soil pH, EC (1:2.5) dsm^{-1}, available nitrogen, available K_2O and BD g cc^{-1}. OC % was observed significantly highest in T_5 over other treatment and remained at par with T_4, T_6 and T_7. Available phosphorus recorded significantly highest with T_6 and remained at par with T_5.

Trial series: AS-68 Impact of integrated application of organics and inorganics in improving soil health and sugarcane

Table AS 68. 1: Initial Soil Analysis:

Parameter	**Soil value**
pH (1:10)	8.00
EC (1:10) dsm^{-1}	0.4
Organic carbon (%)	0.49
Available N (kg ha^{-1})	359
Available P_2O_5 (kg ha^{-1})	23.11
Available K_2O (kg ha^{-1})	358
Bulk density (Mg M^{-3})	1.37

Application of Soil test based fertilizer:

RDF-250-125-125 kg NPK ha^{-1} for 2^{nd} plant crop

1. N - Recommended dose (RD) only i.e. 250 kg N ha^{-1}
2. P - Recommended dose (RD) only i.e. 62.5 kg P_2O_5 ha^{-1}
3. K - Decrease RDK by 50 % i.e. apply 62.5 kg K_2O ha^{-1}

Table AS 68.2 Growth and yield parameters of sugarcane as influenced by different organic and inorganic treatments

Treatment	Germination at 30 DAP	Germination at 45 DAP	No. of tillers at 120 DAP (000 ha^{-1})	No. of tillers at 150 DAP (000 ha^{-1})	Number of Millable cane at harvest (000 ha^{-1})	Millable cane length (cm) at harvest	Cane Diameter (cm) at harvest	Single cane weight (kg)	Cane yield (t ha^{-1})	CCS yield (t ha^{-1})
T_1	43.79	52.88	139.24	146.11	85.48	293.38	2.65	1.03	86.74	11.52
T_2	45.49	56.79	142.68	148.51	93.55	286.79	2.70	1.14	102.33	14.59
T_3	48.29	57.23	165.51	169.32	104.79ab	298.54	2.72	1.16	115.74	16.12
T_4	45.50	55.15	150.50	160.11	93.93	285.25	2.65	1.08	103.82	13.99
T_5	47.57	54.32	148.71	152.49	98.31ab	293.46	2.64	1.15	105.69	14.36
T_6	52.41	61.26	172.73	178.58	106.56ab	272.01	2.67	1.21ab	119.84ab	16.46
T_7	46.03	55.01	152.34	160.40	97.84ab	295.23	2.71	1.07	101.39	13.76
T_8	47.55	56.24	146.67	153.52	102.97ab	293.55	2.73	1.14	106.22	14.87
T_9	56.28	65.42	182.10	189.48	107.70a	298.46	2.77	1.36a	132.71a	17.78
S.Em ±	2.43	2.41	8.94	8.05	4.50	13.22	0.10	0.06	5.59	0.87
C.D.at 5%	7.28	7.23	26.80	24.13	13.50	NS	NS	0.18	16.77	2.60
C.V.%	8.74	7.31	9.95	8.60	7.88	7.88	6.12	9.05	8.95	10.15

Table AS 68.3 Juice quality parameters of sugarcane as influenced by different organic and inorganic treatments

Treatment	At 10 month						At 12 month					
	Brix	**CCS %**	**Pol % juice**	**Purity %**	**Pol % cane**	**Fibre %**	**Brix**	**CCS %**	**Pol % juice**	**Purity %**	**Pol % cane**	**Fibre %**
T_1	17.34	10.23	14.96	86.29	11.59	12.54	21.80	13.26	19.93	91.43	15.11	14.19
T_2	17.57	10.24	15.03	85.53	11.68	12.28	22.07	14.24	20.24	91.67	15.32	14.29
T_3	17.55	10.25	15.04	85.69	11.63	12.68	21.00	13.94	19.54	93.06	14.83	14.10
T_4	17.42	10.46	15.21	87.28	11.78	12.55	20.93	13.46	19.15	91.44	14.55	14.01
T_5	17.73	10.34	15.18	85.63	11.82	12.10	21.87	13.61	19.99	91.44	15.11	14.40
T_6	17.98	10.62	15.52	86.32	12.06	12.31	22.03	13.73	19.89	90.26	15.12	13.98
T_7	17.80	10.58	15.44	86.74	11.99	12.29	21.70	13.57	19.53	89.99	14.83	14.03
T_8	17.41	10.16	14.91	85.68	11.62	12.07	21.63	14.01	19.89	91.93	15.11	14.03
T_9	17.39	10.37	15.11	86.92	11.69	12.60	21.57	13.44	19.97	92.65	15.13	14.19
S.Em ±	0.28	0.19	0.25	0.67	0.20	0.30	0.28	0.47	0.35	1.20	0.28	0.19
C.D.at 5%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
C.V.%	2.72	3.17	2.88	1.35	2.94	4.23	2.27	5.98	3.07	2.28	3.21	2.35

Table AS 68.4: Soil properties after harvest of crop as influenced by different organic and inorganic treatments

Treatment	pH	EC (1:2.5) dsm^{-1}	OC%	Available N ($kg\ ha^{-1}$)	Available P_2O_5 ($kg\ ha^{-1}$)	Available K_2O ($kg\ ha^{-1}$)	BD ($g\ cc^{-1}$)
T_1	7.62	0.24	0.63	227.33	131.67	962.00	1.68
T_2	7.88	0.29	0.65	241.67	145.33	1111.33	1.67
T_3	7.94	0.22	0.58	226.00	119.33	1071.00	1.69
T_4	7.86	0.28	1.35	261.33	159.33	985.67	1.66
T_5	7.90	0.25	1.36	254.33	166.67	1047.33	1.63
T_6	7.81	0.21	1.28	243.33	172.67	1092.33	1.70
T_7	7.81	0.18	1.20	221.00	140.00	1028.33	1.63
T_8	7.90	0.23	1.18	219.00	142.67	980.00	1.65
T_9	7.98	0.18	1.10	221.67	112.33	934.67	1.68
S.Em ±	0.08	0.03	0.05	11.37	8.54	107.39	0.03
C.D.at 5%	NS	NS	0.16	NS	25.63	NS	NS
C.V.%	1.86	20.45	9.02	8.38	10.33	18.17	2.92
Initial	8.00	0.4	0.49	359	23.11	358	1.37

1	Project No.	AS-69
2	Title	Use of plant growth regulators (PGRs) for enhanced yield and quality of sugarcane
3	Objectives	➢ To accelerate rate and extent of sugarcane germination through the use of PGRs ➢ To assess the effect of PGRs on sugarcane growth, yield and juice quality
4	Details of the treatment	➢ T_1: Conventional planting/Farmers' practice (3-bud setts) ➢ T_2: Planting of setts after overnight soaking in water ➢ T_3: Planting of setts after overnight soaking in 50 ppm ethrel solution ➢ T_4: Planting of setts after overnight soaking in 100 ppm ethrel solution ➢ T_5: T_1+ GA3 (35 ppm) spray at 90, 120 and 150 DAP ➢ T_6: T_2 + GA3 (35 ppm) spray at 90, 120 and 150 DAP ➢ T_7: T_3 + GA3 (35 ppm) spray at 90, 120 and 150 DAP ➢ T_8: T_4 + GA3 (35 ppm) spray at 90, 120 and 150 DAP ➢ Date of planting : 04-12-2015 ➢ Variety : CoN 05071 ➢ Spacing : 90 cm ➢ Seed rate : 50,000 two eye bud except treatment T_1 & T_5 ➢ Fertilizer applied : 250-125-125 kg NPK ha^{-1} **Nutrient Basal Top dressing** N 15 % 85% (In 3 splits 30, 20 & 35 % of RDN) P 100% - K 100% - ➢ Date of harvesting : 09-12-2016
5	Design	RBD
6	Replications	Three
7	Plot size	➢ Gross : 6.00 m x 5.40 m ➢ Net : 4.00 m x 3.6 m
8	Climatic parameters	Given in project no. AS 68 (2^{nd} Ratoon crop)
9	Soil health (Initial)	➢ Organic carbon : 0.29% ➢ Available N : 348kg ha^{-1} ➢ Available P_2O_5 : 33.45 kg ha^{-1} ➢ Available K_2O : 360 kg ha^{-1}

10	Summary of results:	The results are given in table AS 69. 1 to 6. Germination % at 20, 40 and 50 DAP were recorded significantly highest with treatment T_3 (Planting of setts after overnight soaking in 50 ppm ethrel solution) over other treatments and remained at par with treatment T_4, T_7 and T_8; Germination % at 10 and 30 DAP was not significantly influenced due to different treatments. Tiller population were not significantly influenced due to different treatment at 90, 120 and 150 DAP; while at 180 DAP significantly highest number of tillers were observed with the treatment T_7 over T_1 and remained at par with T_3, T_4 and T_8. Leaf area index at 120, 150, 180, 210 and 360 DAP were recorded significantly highest with treatment T_8 (T_4 + GA_3 (35 ppm) spray at 90, 120 and 150 DAP) and remained at par with the treatments T_3, T_4, T_6 and T_7 at almost all the growth stages. Leaf area index was not significantly influenced due to different treatments at 90, 240, 270, 300 and 330 DAP. Biomass accumulation from 90 to 150 DAP were recorded significantly highest with treatment T_7 and remained at par with almost all the treatments except T_1; while at 180 to 300 DAP it was recorded significantly highest with the treatment T_7 and remained at par with treatment T_3, T_4 and T_8. At 330 and 360 DAP, different growth treatments were failed to show any significant effect on biomass accumulation. Plant height upto 150 DAP and 210 to 270 DAP was significantly influenced due to different treatments. Significantly highest plant height was recorded with T_7 over other treatment and remained at par with T_3, T_4 and T_8 at almost all the growth stages. Plant height was not significantly influenced due to different plant growth treatment at 180, 240, 300, 330 and 360 DAP. Root dry weight at 50 and 180 DAP were recorded significantly highest with treatment T_8 over other treatment and remained at par with T_2 and T_7 however T_4 also found equally effective at 180 DAP. At 180 DAP, it was not significantly influenced due to different treatments. NMC (111.08 000 ha^{-1}) was significantly recorded higher with treatment T_7 and remain at par the treatments T_3, T_4, T_6 and T_8. Cane length and cane diameter at harvest is failed to show any significant effect due to different treatment. Single Cane weight was recorded significantly highest with treatment T_7 over other treatment and remained at par with T_3 and T_8. Significantly highest cane yield (127.27 t ha^{-1}) was noticed with treatment T_8 (Planting of setts after overnight soaking in 100 ppm ethrel solution + GA_3 (35 ppm) spray at 90, 120 and 150 DAP) but remained at par with T_3, T_4, and T_7 over T_1. CCS yield was not significantly influenced due to various treatments. Various quality parameters were not significantly influenced due to different treatments.

Table AS 69. 1: Effect of plant growth regulators on germination % and tiller population

Treatment	Germination % at					Tiller population at (000 ha^{-1})			
	10 DAP	20 DAP	30 DAP	40 DAP	50 DAP	90 DAP	120 DAP	150 DAP	180 DAP
T_1	9.01	17.60	38.36	43.85	52.03	151.80	160.42	160.79	123.59
T_2	9.59	16.19	35.15	40.31	48.28	155.97	161.11	167.92	130.65
T_3	10.67	20.22	44.75	50.39	61.13	169.44	173.84	180.53	143.38
T_4	10.33	18.17	41.93	47.35	57.22	166.75	170.61	177.31	138.84
T_5	8.93	17.79	38.84	43.11	53.79	159.91	164.49	166.13	127.98
T_6	8.39	17.47	35.84	42.49	51.75	157.04	167.38	170.46	133.33
T_7	10.16	19.53	41.00	46.03	56.84	164.24	164.08	185.56	149.75
T_8	9.72	19.27	38.29	44.67	54.71	165.08	176.64	183.06	145.06
SEM.±	0.48	0.78	1.89	1.77	2.37	6.04	8.09	7.51	5.41
C.D. at 5%	NS	2.38	NS	5.38	7.17	NS	NS	NS	16.42
C.V.%	8.64	7.42	8.33	6.86	7.52	6.49	8.37	7.48	6.86

Table AS 69. 2: Effect of plant growth regulators on leaf area index

Treatment	Leaf area index at									
	90 DAP	120 DAP	150 DAP	180 DAP	210 DAP	240 DAP	270 DAP	300 DAP	330 DAP	360 DAP
T_1	0.29	0.47	1.00	1.99	2.48	3.21	3.74	3.72	3.65	3.30
T_2	0.37	0.64	1.15	2.25	2.67	3.29	4.12	3.94	3.76	3.43
T_3	0.34	0.61	1.08	2.57	2.98	3.56	4.61	4.30	4.24	3.90
T_4	0.35	0.70	1.11	2.47	2.85	3.46	4.77	4.13	4.09	3.70
T_5	0.34	0.57	0.98	2.40	2.57	3.28	4.33	3.86	3.86	3.51
T_6	0.36	0.67	1.19	2.46	2.72	3.40	4.43	4.02	3.92	3.57
T_7	0.36	0.69	1.24	2.67	3.07	3.60	4.91	4.48	4.38	4.04
T_8	0.40	0.72	1.30	2.71	3.11	3.64	5.01	4.52	4.46	4.14
SEM.±	0.02	0.03	0.07	0.10	0.13	0.15	0.20	0.21	0.18	0.18
C.D. at 5%	NS	0.08	0.20	0.31	0.40	NS	NS	NS	NS	0.55
C.V.%	10.39	7.39	10.12	7.30	8.08	7.52	7.66	8.88	7.85	8.53

Table AS 69. 3: Effect of plant growth regulators on biomass accumulation

Treatment	Biomass accumulation at 90 DAP (t ha^{-1})									
	90 DAP	**120 DAP**	**150 DAP**	**180 DAP**	**210 DAP**	**240 DAP**	**270 DAP**	**300 DAP**	**330 DAP**	**360 DAP**
T_1	1.84	3.62	5.51	14.66	21.00	28.05	37.26	42.09	47.04	51.13
T_2	2.36	3.66	5.72	15.19	21.90	28.76	37.97	42.84	47.78	52.07
T_3	2.48	4.24	6.31	17.87	24.21	31.53	42.23	46.80	51.48	55.60
T_4	2.47	4.23	6.27	17.49	23.83	30.95	41.50	45.62	50.60	54.90
T_5	2.45	4.17	6.22	15.87	22.21	29.81	39.00	44.22	48.59	52.84
T_6	2.47	4.22	6.28	16.70	23.04	30.54	39.36	44.80	49.62	53.80
T_7	2.52	4.29	6.36	20.41	26.74	34.30	43.45	48.97	52.85	57.52
T_8	2.49	4.25	6.32	19.95	26.29	33.87	43.14	48.20	52.46	56.78
SEM.±	0.11	0.17	0.19	0.79	1.05	1.20	1.43	1.47	1.92	1.99
C.D. at 5%	0.33	0.50	0.58	2.40	3.18	3.63	4.35	4.46	NS	NS
C.V.%	7.88	7.03	5.44	7.94	7.68	6.69	6.13	5.61	6.63	6.35

Table AS 69. 4: Effect of plant growth regulators on plant height

Treatment	Plant height (cm) at										
	60 DAP	**90 DAP**	**120 DAP**	**150 DAP**	**180 DAP**	**210 DAP**	**240 DAP**	**270 DAP**	**300 DAP**	**330 DAP**	**360 DAP**
T_1	81.37	98.21	117.15	133.58	159.26	170.25	187.28	201.54	220.45	233.88	243.63
T_2	85.37	102.34	122.45	136.48	163.14	178.91	191.99	205.14	218.54	230.31	240.99
T_3	107.73	124.43	143.57	158.54	183.79	199.63	216.84	232.44	243.08	253.46	262.54
T_4	102.24	119.92	139.20	155.91	180.91	197.86	213.21	226.99	235.24	246.31	256.02
T_5	90.09	102.26	124.50	137.84	166.38	180.37	196.88	211.64	221.54	232.76	241.96
T_6	92.02	106.86	126.82	140.61	168.69	183.64	202.23	216.95	226.65	235.58	245.45
T_7	104.84	128.30	148.53	162.09	189.01	205.09	230.89	244.62	252.97	263.67	273.31
T_8	110.74	121.54	142.19	158.54	185.79	202.74	220.37	234.29	242.87	253.78	264.56
SEM.±	4.99	5.17	6.31	6.55	7.26	7.83	9.15	9.15	10.84	10.01	11.23
C.D. at 5%	15.13	15.67	19.13	19.87	NS	23.74	27.75	27.84	NS	NS	NS
C.V.%	8.92	7.92	8.21	7.67	7.20	7.14	7.64	7.17	8.07	7.12	7.67

Table AS 69. 5: Effect of plant growth regulators on root dry wt. and yield parameter (NMC, cane length, cane girth, single cane wt. and cane yield

Treatment	Root Dry wt. at (t ha^{-1})			NMC at harvest (000 ha^{-1})	Cane length (cm) at harvest	Cane Diameter (cm) at harvest	Single cane wt at harvest (kg)	Cane yield (t ha^{-1})	CCS yield (t ha^{-1})
	50 DAP	120 DAP	180 DAP						
T_1	0.22	0.36	0.41	84.37	257.20	2.56	1.19	100.58	14.06
T_2	0.30	0.39	0.49	94.61	263.66	2.61	1.05	105.35	14.09
T_3	0.24	0.39	0.42	107.17	280.47	2.71	1.42	121.40	16.68
T_4	0.27	0.41	0.45	103.01	280.42	2.66	1.26	124.73	17.01
T_5	0.22	0.39	0.39	95.44	263.78	2.61	1.25	105.01	15.12
T_6	0.26	0.42	0.43	100.29	270.31	2.67	1.22	106.87	14.05
T_7	0.30	0.45	0.47	111.08	296.98	2.78	1.50	124.13	16.12
T_8	0.34	0.46	0.51	106.86	290.64	2.79	1.33	127.27	17.61
SEM.±	0.01	0.02	0.02	5.14	15.62	0.11	0.06	6.53	0.98
C.D. at 5%	0.04	NS	0.07	15.60	NS	NS	0.19	19.81	NS
C.V.%	8.85	8.26	9.02	8.88	9.82	7.23	8.60	9.89	10.89

Table AS 69. 6: Effect of plant growth regulators on juice quality parameter at harvest

Treatment	Brix %	Pol % Juice	Purity %	CCS%	Fibre %	Pol % Cane
T_1	21.57	19.84	91.99	13.98	14.14	15.05
T_2	20.63	18.93	91.83	13.37	14.17	14.36
T_3	21.43	19.53	91.15	13.74	14.21	14.81
T_4	20.90	19.45	93.04	13.63	14.31	14.72
T_5	21.73	19.62	90.29	14.40	14.33	14.85
T_6	20.83	19.01	91.26	13.14	14.32	14.39
T_7	20.73	19.05	91.91	12.99	14.30	14.42
T_8	21.30	19.39	91.08	13.84	14.10	14.71
SEM.±	0.53	0.39	0.76	0.40	0.21	0.30
C.D. at 5%	NS	NS	NS	NS	NS	NS
C.V.%	4.33	3.56	1.44	5.02	2.56	3.58

1	Project No.	AS 70
2	Title	Scheduling irrigation with mulch under different sugarcane planting methods
3	Objectives	To enhance crop and water productivity in sugarcane
4	Details of the treatment	**Planting methods: P** P_1: Furrow planting (120 cm row spacing) without mulching P_2: Furrow planting (120 cm row spacing) with green manure (dhaincha) sowing at 30 DAP, mulching at 75 DAP and earthing up at 110 DAP P_3: Furrow planting (120 cm row spacing) with alternate skip furrow irrigation* after earthing up without mulching P_4: Furrow planting (120 cm row spacing) with alternate skip furrow irrigation * after earthing up + green manure/brown mulching * First irrigation to be given in furrow nos. 1, 3, 5. Second irrigation to be given in furrow nos. 2 & 4. Similar schedule should be followed in successive irrigation. **Irrigation schedule (IW/CPE):I** I_1: 0.60 I_2: 0.80 I_3: 1.00 Irrigation water depth: 7.5 cm Date of planting : 22-01-2016 ➢ Variety : CoN 05071 ➢ Spacing : 120 cm ➢ Seed rate : 50,000 two eye bud ➢ Fertilizer applied : 250-125-125 kg NPK ha^{-1} **Nutrient** **Basal** **Top dressing** N 15 % 85% (In 3 splits 30, 20 & 35 % of RDN) P 100% - K 100% - ➢ Date of harvesting : 15-02-2017
5	Design	Strip plot
6	Replications	Three
7	Plot size	Gross:8 m x 6 m Net: 6 m x 3.6 m

8	Climatic parameters	Given in project no. AS 68 (2nd Ratoon crop)
9	Soil health (Initial)	➢ pH : 7.28 ➢ EC (1:2.5) ds m^{-1} : 0.3 ➢ Organic carbon : 0.20% ➢ Available N : 295 kg ha^{-1} ➢ Available P_2O_5 : 277 kg ha^{-1} ➢ Available K_2O : 434 kg ha^{-1} ➢ Bulk density : 1.36
10	Summary of results:	The results are given in table AS 70. 1 to 6. Germination % at 30 DAP were recorded significantly highest with planting method P_3 (Furrow planting (120 cm row spacing) with alternate skip furrow irrigation* after earthing up without mulching) over other planting method and remained at par with treatment P_4 (Furrow planting (120 cm row spacing) with alternate skip furrow irrigation * after earthing up + green manure/brown mulching). Irrigation levels failed to show significant effect on germination %. Interaction effect of planting methods and irrigation levels was found non significant. Tiller population was significantly influenced due to different planting methods at 90, 120 and 180 DAP. At all the stages, significantly highest numbers of tillers were recorded with planting methods P_4 and P_2 and remained at par with each other over other methods. Irrigation levels did not show significant effect at 90 DAP however, significantly highest tillers population was observed with irrigation level I_3 (1.00 IW/CPE ratio) and remained at par with I_2 over I_1 at 120 and 180 DAP. Significantly highest plant height was noticed with planting method P_4 and P_2 and found equally effective over other methods at all the growth stages. Irrigation level I_3 recorded significantly highest plant height (151.45, 167.46, 183.50 cm) at 90, 120 and 180 DAP respectively over I_1 and remained at par with I_2. NMC (106.71 000 ha^{-1}) was significantly recorded higher with planting method P_4 (Furrow planting (120 cm row spacing) with alternate skip furrow irrigation * after earthing up + green manure/brown mulching) and remained at par with P_2. Significantly highest and lowest NMC were recorded with

		irrigation levels I_3 and I_1 respectively. Cane length did not show any significant effect due to planting method and irrigation levels. Cane diameter was significantly highest with planting methods P_4 and P_2 over others methods while it failed to show levels of significance due to irrigation levels. Planting methods did not show significant effect on single cane weight while irrigation level I_3 recorded significantly highest single cane weight (1.30 kg) over I_1 and I_2. Significantly highest cane (117.26 t ha^{-1}) and CCS (16.28 t ha^{-1}) yield was noticed with planting method P_4 but remained at par with P_2 over other methods. Significantly highest cane (122.12 t ha^{-1}) and CCS (16.68 t ha^{-1}) yield was observed with irrigation level I_3 over I_1 and I_2. Among various quality parameters only CCS % and pol % cane were significantly influenced due to planting methods. Significantly highest CCS % and pol % cane were observed with planting method P_4 and remained at par with P_2 and P_3 over P_1. Quality parameters were not significantly influenced due to irrigation levels. There was no significant difference observed due to planting method and irrigation level on soil pH, available nitrogen, available phosphorus available K_2O and BD g cc^{-1}. EC (1:2.5) dsm^{-1} recorded significantly lowest with planting method P_1 and remained at par with P_2 while OC % was recorded significantly highest with planting method P_1 and at par with P_4 however soil EC and OC % was not significantly influenced due to irrigation levels . Field water use efficiency was recorded highest (129.15 kg ha^{-1} mm^{-1}) with irrigation level I_1 followed by I_2 (105.81 kg ha^{-1} mm^{-1}) and I_3 (101.77 kg ha^{-1} mm^{-1}) Interaction effect between planting methods and irrigation levels was found non significant for above all the growth, yield, quality and soil parameters.

Table: AS 70.1 : Effect of planting methods and irrigation levels on growth parameters of sugarcane

Treatment	Germination % at 30 DAP	No. of tillers (000 ha^{-1}) at			Plant height (cm) at	Plant height (cm) at	Plant height (cm) at
		90 DAP	120 DAP	180 DAP	90 DAP	120 DAP	180 DAP
Planting method							
P_1	42.90	148.81	159.13	123.52	135.85	150.85	162.43
P_2	42.48	159.84	170.31	133.57	147.14	161.57	174.60
P_3	49.82	146.43	156.18	120.69	133.01	148.39	162.14
P_4	47.50	163.96	176.09	138.82	151.49	167.89	183.78
S.EM.±	1.10	3.79	4.29	3.74	4.01	4.13	4.58
C.D. at 5%	3.82	13.11	14.84	12.96	13.88	14.30	15.84
C.V.%	7.25	7.34	7.78	8.70	8.48	7.89	8.04
Irrigation level							
I_1	47.22	150.73	156.20	120.87	133.20	149.04	160.66
I_2	45.63	154.41	163.41	127.71	140.97	155.03	168.05
I_3	44.17	159.14	176.67	138.87	151.45	167.46	183.50
S. EM.±	1.16	3.01	3.85	3.19	3.40	3.36	4.40
C.D. at 5%	NS	NS	15.13	12.52	13.50	13.19	17.26
C.V.%	8.79	6.75	8.07	8.55	8.30	7.40	8.92
Interaction							
S.EM.±	2.15	5.89	6.75	6.52	7.07	6.48	6.15
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS
C.V.%	8.15	6.59	7.07	8.74	8.63	7.14	6.24

Table: AS 70.2 : Effect of planting methods and irrigation levels on yield parameters of sugarcane

Treatment	NMC at harvest (000 ha^{-1})	Cane length at harvest (cm)	Cane diameter at harvest (cm)	Single cane weight (kg)	Cane yield (t ha^{-1})	CCS yield (t ha^{-1})
Planting method						
P_1	99.42	275.56	2.41	1.06	105.07	14.00
P_2	103.40	283.56	2.51	1.09	111.62	15.31
P_3	92.15	264.22	2.43	1.07	95.57	13.15
P_4	106.71	292.11	2.61	1.11	117.26	16.28
S.EM.±	2.85	8.14	0.04	0.04	2.51	0.31
C.D. at 5%	9.86	NS	0.14	NS	8.69	1.06
C.V.%	8.51	8.76	5.03	9.82	7.01	6.26
Irrigation level						
I_1	95.44	271.75	2.39	0.96	96.86	13.27
I_2	97.75	278.92	2.52	0.99	103.16	14.10
I_3	108.08	285.92	2.56	1.30	122.12	16.69
S. EM.±	2.52	6.57	0.06	0.03	2.46	0.39
C.D. at 5%	9.90	NS	NS	0.11	9.65	1.54
C.V.%	8.70	8.16	9.02	9.26	7.93	9.27
Interaction						
S.EM.±	5.77	13.51	0.08	0.05	5.74	0.91
C.D. at 5%	NS	NS	NS	NS	NS	NS
C.V.%	9.95	8.39	5.32	7.80	9.26	10.76

Table: AS 70.3: Effect of planting methods and irrigation levels on juice quality parameters of sugarcane at harvest

Treatment	Brix	CCS %	Purity %	Fibre %	Pol % Juice	Pol % Cane
Planting method						
P_1	20.99	13.31	90.63	14.28	19.02	14.40
P_2	21.6	13.71	90.69	14.18	19.58	14.85
P_3	21.73	13.76	90.50	14.12	19.67	14.92
P_4	21.77	13.89	91.03	14.14	19.81	15.03
S.EM.±	0.28	0.09	0.48	0.08	0.16	0.12
C.D. at 5%	NS	0.32	NS	NS	NS	0.42
C.V.%	3.84	2.03	1.57	1.70	2.51	2.45
Irrigation level						
I_1	21.36	13.69	91.27	14.15	19.49	14.79
I_2	21.55	13.66	90.59	14.16	19.52	14.80
I_3	21.66	13.66	90.28	14.24	19.55	14.81
S. EM.±	0.08	0.07	0.21	0.06	0.09	0.07
C.D. at 5%	NS	NS	NS	NS	NS	NS
C.V.%	1.36	1.78	0.81	1.49	1.57	1.64
Interaction						
S.EM.±	0.28	0.19	0.75	0.17	0.25	0.18
C.D. at 5%	NS	NS	NS	NS	NS	NS
C.V.%	2.22	2.45	1.42	2.08	2.18	2.12

Table AS 71.4: Effect of planting methods and irrigation levels on soil properties after harvest of sugarcane crop

Treatment	pH (1:2.5)	EC (1:2.5) dsm^{-1}	OC %	Available N ($kg\ ha^{-1}$)	Available P_2O_5 ($kg\ ha^{-1}$)	Available K_2O ($kg\ ha^{-1}$)	BD (g/cc)
Planting method							
P_1	8.13	0.39	0.79	185.33	133.11	1271.78	1.67
P_2	8.18	0.51a	0.64	185.44	128.56	1160.44	1.64
P_3	8.18	0.54	0.59	171.78	117.56	1138	1.61
P_4	8.16	0.65	0.76a	184.00	123.33	1106.67	1.67
S.EM.±	0.05	0.03	0.04	20.56	5.29	67.43	0.03
C.D. at 5%	NS	0.12	0.14	NS	NS	NS	NS
C.V.%	1.73	19.44	17.69	33.96	12.64	17.30	6.09
Irrigation level							
I_1	8.14	0.54	0.77	181.75	118.83	1205.08	1.66
I_2	8.18	0.52	0.65	178.83	125.08	1143.5	1.65
I_3	8.17	0.52	0.67	184.33	133.00	1159.08	1.64
S. EM.±	0.03	0.04	0.03	7.16	6.65	55.87	0.03
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS
C.V.%	1.07	28.44	15.31	13.65	18.35	16.55	5.43
Interaction							
S.EM.±	0.08	0.07	0.07	26.80	8.30	82.00	0.05
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS
C.V.%	1.73	22.03	17.01	25.56	11.45	12.15	5.24
Initial	7.25	0.5	0.39	195	177	434	1.36

Table: AS 70.4: Treatment wise number of irrigations with field water use efficiency (kg ha^{-1} mm^{-1})

No. of irrigations	Date of irrigation		
	I_1	I_2	I_3
1-common irrigation	22.01.2016	22.01.2016	22.01.2016
2-common irrigation	19.02.2016	19.02.2016	19.02.2016
3	20.03.2016	13.03.2016	09.03.2016
4	10.04.2016	30.03.2016	24.03.2016
5	28.04.2016	14.04.2016	05.04.2016
6	17.05.2016	28.04.2016	17.04.2016
7	04.06.2016	12.05.2016	28.04.2016
8	19.11.2016	26.05.2016	09.05.2016
9	25.12.2016	09.06.2016	21.05.2016
10	03.02.2017	09.11.2016	01.06.2016
11		07.12.2016	11.06.2016
12		03.01.2017	04.11.2016
13		03.02.2017	26.11.2016
14			18.12.2016
15			09.01.2016
16			03.02.2017
No. of irrigations	10	13	16
Depth of irrigation water (mm)	75	75	75
Total quantity irrigation water (mm)	750	975	1200
Yield (kg ha^{-1})	96860	103160	122120
Field water use efficiency (kg ha^{-1} mm^{-1})	129.15	105.81	101.77

1	Project No.	AS 72
2	Title	Agronomic performance of elite sugarcane genotypes (early group)
3	Objectives	To work out agronomy of sugarcane genotypes of advanced varietal trial (AVT)
4	Details of the treatment	**Variety** V_1- Co 10004 V_2-Co 10005 V_3-Co 10006 V_4- Co 10024 V_5-Co 10026 V_6-Co 10027 V_7-CoT 10366 V_8- CoT 10367 **Check:** V_9-Co 85004 V_{10}-Co94008 V_{11}-CoC 671 ➢ **Fertilizer level:** F_1 - 125 % of recommended dose of NPK kg ha^{-1} ➢ Recommended dose : 250-125-125 kg NPK ha^{-1} ➢ Spacing : 150 cm ➢ Seed rate : 50000 two eye bud setts ha^{-1} ➢ Date of Planting : 09-01-2016 ➢ Fertilizer applied : As per treatment **Nutrient Basal Top dressing** N 15 % 85% (In 3 splits 30, 20 & 35 % of RDN) P 100% - K 100% - ➢ Date of harvesting : 21-02-2017
5	Design	RBD
6	Replications	Three
7	Plot size	Gross : Gross : 6.00m x 6.00m Net : 4.00m x 3.00m
8	Climatic parameters	Given in project no. AS 68 (2nd Ratoon crop)

9	Soil health (Initial)	➢ pH : 7.65 ➢ EC (1:2.5) ds m^{-1} : 0.35 ➢ Organic carbon : 0.30% ➢ Available N : 257 kg ha^{-1} ➢ Available P_2O_5 : 135 kg ha^{-1} ➢ Available K_2O : 537 kg ha^{-1} ➢ Bulk density : 1.32
10	Summary of results:	The results are given in table AS 72. 1 & 2. Germination % at 45 DAP were recorded significantly highest with variety V_5 (Co 10026) over other varieties and at par with variety V_1 (Co 10004), V_4 (Co 10024) and V_6 (Co 10026) over checks. Number of tillers were significantly influenced due to different varieties at 120 and 180 DAP; significantly highest number of tiller (148.19 000 ha^{-1}) was recorded with V_{11} (CoC 671) and at par with V_1, V_2, V_4, V_5 and V_6 at 120 DAP while at 180 DAP it remained at par with V_1, V_4 and V_5. Variety V_1 (Co 10004) recorded significantly highest NMC (104.44 000 ha^{-1}) over checks and remained at par with variety V_2, V_3, V_4, V_5 and V_6. Significantly highest cane length was noticed with check V_9 (Co 85004) and remained at par with almost all the variety except V_2 and checks V_{10} and V_{11}. Different varieties did not show any significant effect on cane diameter. Check V_9 (Co 85004) recorded significantly highest single cane weight (1.34 kg) and remained at par with almost all the varieties except V_6 and checks V_{10} and V_{11}. Significantly highest cane yield (120.18 t ha^{-1}) was recorded with variety V_4 (C0 10024) over checks and remained at par with all the varieties except V_3. Variety V_4 (Co10024) recorded significantly highest CCS yield (16.49 t ha^{-1}) over checks and at par with V_1, V_2, V_5 and V_8. Among various quality parameters, brix, pol % juice, purity %, pol % cane and CCS % were significantly influenced under different varieties. Significantly highest brix and pol % juice were recorded with variety V_4 (Co 10024) and at par with V_3, V_8 and V_9. Purity % was recorded highest with checkV_{11} (CoC 671) and V2 (Co 10005) and remained at par with each other. Pol % cane and CCS % was recorded significantly highest with V_8 (CoT 10367) and remend at par with V_3, V_4 and Checks V_9 and V_{11}.

Table AS 72. 1: Growth, yield parameters, cane and CCS yields of sugarcane as influenced by sugarcane varieties

Variety	Germination % at 45 DAP	No. of tillers at 120 DAP (000 ha^{-1})	No. of tillers at 180 DAP (000 ha^{-1})	NMC (000 ha^{-1}) at harvest	Cane length at harvest (cm)	Cane diameter (cm)	Single cane weight (kg)	Cane yield (t ha^{-1})	CCS yield (t ha^{-1})
V_1- Co 10004	49.56	140.97	115.30	104.44	262.00	2.53	1.25	119.78	15.95
V_2-Co 10005	42.06	132.36	106.69	99.72	224.66	2.38	1.24	110.17	14.72
V_3-Co 10006	46.53	128.86	103.19	93.06	255.40	2.46	1.22	102.19	14.01
V_4- Co 10024	54.63	134.61	108.94	102.78	270.26	2.63	1.33	120.18	16.49
V_5-Co 10026	55.33	135.68	110.00	92.78	271.91	2.74	1.24	109.59	14.42
V_6-Co 10027	49.55	133.16	107.49	91.39	275.86	2.66	1.17	105.74	13.99
V_7-CoT 10366	48.39	128.90	103.23	88.06	277.26	2.62	1.22	107.01	14.19
V_8- CoT 10367	48.77	130.64	104.96	87.22	257.68	2.67	1.27	106.14	14.56
V_9-Co 85004	44.13	122.42	96.74	83.33	282.87	2.71	1.34	94.36	12.95
V_{10}-Co94008	42.15	117.02	91.34	81.39	244.09	2.65	1.17	95.02	12.60
V_{11}-CoC 671	44.79	148.19	122.52	94.72	241.61	2.49	1.03	94.16	12.87
S. Em. ±	2.17	5.42	4.86	4.51	11.52	0.11	0.04	5.52	0.76
C.D. at 5%	6.41	16.00	14.34	13.31	33.98	NS	0.13	16.29	2.24
C.V. %	7.87	7.11	7.91	8.44	7.66	7.01	6.02	9.04	9.22

Table AS 72. 2: Juice quality parameters of sugarcane as influenced by sugarcane varieties

Variety	Brix	Pol (%) juice	Purity (%)	Fibre (%)	Pol (%) cane	C.C.S. (%)
V_1- Co 10004	20.95	19.01	90.74	14.09	14.43	13.31
V_2-Co 10005	20.88	19.03	91.13	14.25	14.41	13.35
V_3-Co 10006	21.71	19.62	90.39	14.26	14.86	13.71
V_4- Co 10024	21.98	19.69	89.59	14.09	14.95	13.71
V_5-Co 10026	21.18	18.95	89.48	14.10	14.38	13.19
V_6-Co 10027	20.79	18.87	90.79	14.28	14.29	13.22
V_7-CoT 10366	21.00	18.96	90.33	14.15	14.38	13.25
V_8- CoT 10367	21.87	19.68	89.99	13.99	14.96	13.73
V_9-Co 85004	21.66	19.60	90.54	14.04	14.89	13.71
V_{10}-Co 94008	20.97	18.96	90.40	13.91	14.43	13.26
V_{11}-CoC 671	20.88	19.34	92.60	14.07	14.68	13.67
S. Em. ±	0.28	0.22	0.52	0.11	0.17	0.15
C.D. at 5%	0.84	0.65	1.52	NS	0.50	0.45
C.V. %	2.31	1.97	0.99	1.31	2.00	1.96

1	Project No.	AS 72
2	Title	Agronomic performance of elite sugarcane genotypes (midlate group)
3	Objectives	To work out agronomy of sugarcane genotypes of advanced varietal trial (AVT)
4	Details of the treatment	**Variety (Genotypes)** V_1- Co 09009 V_2-Co 10015 V_3-Co 10031 V_4- Co 10033 V_5-Co 10368 V_6-Co 10369 V_7-CoVC 10061 V_8- PI 10131 V_9-PI 10132 **Check:** V_{10}-Co 86032 V_{11}-Co 99004 ➢ **Fertilizer level** ➢ F_1 - 125 % of recommended dose of NPK kg ha^{-1} ➢ Recommended dose : 250-125-125 kg NPK ha^{-1} ➢ Spacing : 150 cm ➢ Seed rate : 50000 two eye bud setts ha^{-1} ➢ Date of planting : 25-02-2016 ➢ Fertilizer applied : As per treatment **Nutrient** **Basal** **Top dressing** N 15 % 85% (In 3 splits 30, 20 & 35 % of RDN) P 100% - K 100% - ➢ Date of harvesting : 02-03-2016
5	Design	RBD
6	Replications	Three
7	Plot size	➢ Gross : 6.00 m x 6.00 m ➢ Net : 4.00 m x 3.00 m

8	Climatic parameters	Given in project no. AS 68 (2nd Ratoon crop)
9	Soil health (Initial)	➢ pH : 7.53 ➢ EC (1:2.5) ds m^{-1} : 0.34 ➢ Organic carbon : 0.29% ➢ Available N : 266 kg ha^{-1} ➢ Available P_2O_5 : 146 kg ha^{-1} ➢ Available K_2O : 505 kg ha^{-1} ➢ Bulk density : 1.26
10	Summary of results:	The results are given in table AS 72. 3 & 4. Germination % at 30 DAP were recorded significantly highest with variety V_8 (PI 10131) over V_5, V_7, V_9 and V_{11}. Significantly highest (173.41 & 139.27 000 ha^{-1}) and lowest (127.58 & 93.58 000 ha^{-1}) number of tillers were recorded with variety V_4 (C0 10033) and check V_{11} (Co 99004) respectively at 120 and 180 DAP. Check V_{10} (Co 86032) recorded significantly highest NMC (125.70 000 ha^{-1}) over other variety and remained at par with variety V_2 and V_6. Significantly highest cane length was noticed with variety V_9 (PI 10132) over checks and remained at par variety V_2, V_3 and V_6. Variety V_2 (Co 10015) recorded significantly highest cane diameter over V_1, V_3 and V_9 while other variety and check remained at par. Variety V_2 (Co 10015) recorded significantly highest single cane weight (1.20 kg) over check Co 86032 (V_{10}) and variety V_1 and V_3 while other varieties and check remained at par with V_{10}. Significantly highest cane yield (127.78 t ha^{-1}) was recorded with variety V_2 (C0 10015) over checks and remained at par with the varieties V_5, V_6 and V_8. CCS yield was not significantly influenced due to different varieties. Among various quality parameters, brix, pol % juice, pol % cane and CCS % were significantly influenced with different varieties. Significantly highest this parameters were recorded with variety V_5 (CoT 10368) and check V_{11} (Co 99004) and found equally effective over other varieties further pol % juice and pol % cane remained also at par with V_4 and CCS % with variety V_4 and V_6.

Table AS 72. 3: Growth, yield parameters, cane and CCS yield of sugarcane as influenced by sugarcane varieties

Variety	Germination % at 30 DAP	No. of tillers at 120 DAP (000 ha^{-1})	No. of tillers at 180 DAP (000 ha^{-1})	NMC (000 ha^{-1}) at harvest	Cane length at harvest (cm)	Cane diameter (cm)	Single cane weight (kg)	Cane yield (t ha^{-1})	CCS yield (t ha^{-1})
V_1-Co 09009	45.38	138.54	105.87	108.12	261.33	2.45	1.05	111.75	15.18
V_2-Co 10015	47.14	149.23	114.92	122.62	295.00	2.59	1.20	127.78	17.12
V_3-Co 10031	45.92	144.31	110.13	108.98	272.00	2.43	1.02	110.41	15.24
V_4-Co 10033	45.26	173.41	139.27	109.62	256.67	2.56	1.11	108.06	15.40
V_5-CoT 10368	41.75	146.14	111.66	105.05	246.67	2.62	1.07	114.93	16.60
V_6-CoT 10369	49.55	145.54	111.35	117.49	273.67	2.65	1.06	122.50	17.02
V_7-Co VC 10061	41.90	140.15	105.94	109.99	196.67	2.71	1.17	111.75	15.42
V_8-PI 10131	50.33	142.47	109.05	109.05	265.67	2.59	1.12	116.63	15.08
V_9-PI 10132	44.13	137.01	102.61	104.71	309.00	2.54	1.16	108.59	14.64
V_{10}-Co 86032	45.21	146.94	113.46	125.70	245.67	2.57	0.95	109.33	14.67
V_{11}-Co 99004	42.35	127.58	93.58	99.46	262.33	2.57	1.07	95.44	13.29
S. Em. ±	1.85	6.99	7.10	5.11	13.23	0.05	0.05	5.41	0.84
C.D. at 5%	5.44	20.62	20.97	15.07	39.02	0.15	0.14	15.95	NS
C.V. %	7.05	8.37	11.12	7.97	8.74	3.45	7.43	8.33	9.47

Table AS 72. 4: Juice quality parameters of sugarcane as influenced by sugarcane varieties

Variety	Brix	Pol (%) juice	Purity (%)	Fibre (%)	Pol (%) cane	C.C.S. (%)
V_1-Co 09009	21.35	19.38	90.78	14.03	14.72	13.6
V_2-Co 10015	20.89	19.08	91.32	13.91	14.52	13.4
V_3-Co 10031	21.87	19.75	90.33	14.25	14.96	13.8
V_4-Co 10033	22.45	20.33	90.54	14.01	15.45	14.2
V_5-CoT 10368	22.99	20.70	90.01	14.13	15.70	14.4
V_6-CoT 10369	22.22	19.93	89.69	13.92	15.16	13.9
V_7-Co VC 10061	21.83	19.73	90.38	14.16	14.96	13.8
V_8-PI 10131	20.70	18.56	89.64	13.98	14.11	12.9
V_9-PI 10132	21.41	19.29	90.12	14.05	14.65	13.5
V_{10}-Co 86032	21.94	19.37	88.29	14.06	14.71	13.4
V_{11}-Co 99004	22.58	20.08	88.96	14.17	15.23	13.9
S. Em. ±	0.17	0.22	0.76	0.16	0.17	0.20
C.D. at 5%	0.51	0.66	NS	NS	0.51	0.59
C.V. %	1.38	1.98	1.46	1.99	2.02	2.52