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ANNUAL RESEARCH REPORT
ALL INDIA COORDINATED RESEARCH
PROJECT ON SUGARCANE
(AGRONOMY)
(2014 - 2015)



RESEARCH SCIENTIST (SUGARCANE)
MAIN SUGARCANE RESEARCH STATION
NAVSARI AGRICULTURAL UNIVERSITY
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ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE

CENTRE: NAVSARI

ANNUAL REPORT 2014-15

1	Project No.	AS 42												
2	Title	Agronomic evaluation of promising new sugarcane genotypes (plant crop) (early group)												
3	Objectives	To work out agronomy of sugarcane genotypes of advanced varietal trial (AVT)												
4	Details of the treatment	<ul style="list-style-type: none"> ➤ Variety <li style="padding-left: 20px;">V₁ – Co 08001 <li style="padding-left: 20px;">V₂ – CoVSI 08121 <li style="padding-left: 20px;">V₃ – CoN 09071 <li style="padding-left: 20px;">V₄ – CoN 10071 ➤ Fertilizer levels: <li style="padding-left: 20px;">F₁ - 75 % of recommended dose of N kg/ha <li style="padding-left: 20px;">F₂ - 100 % of recommended dose of N kg/ha <li style="padding-left: 20px;">F₃ - 125 % of recommended dose of N kg/ha ➤ Recommended dose : 250-125-125 kg NPK/ha ➤ Spacing : 100 cm ➤ Seed rate : 50000 two eye bud setts ha⁻¹ ➤ Date of Planting : 27-01-2014 ➤ Fertilizer applied : As per treatment <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Nutrient</th> <th style="text-align: left;">Basal</th> <th style="text-align: left;">Top dressing</th> </tr> </thead> <tbody> <tr> <td style="padding-left: 20px;">N</td> <td>15 %</td> <td>85% (In 3 splits 30, 20 & 35 % of RDN)</td> </tr> <tr> <td style="padding-left: 20px;">P</td> <td>100%</td> <td style="text-align: center;">-</td> </tr> <tr> <td style="padding-left: 20px;">K</td> <td>100%</td> <td style="text-align: center;">-</td> </tr> </tbody> </table> ➤ Date of harvesting : 12-02-2015 	Nutrient	Basal	Top dressing	N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)	P	100%	-	K	100%	-
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5	Design	RBD (Factorial)												
6	Replications	Three												
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8	Climatic parameters	Meteorological observations recorded at Main Sugarcane Research Station, NAU, Navsari from Oct. 2012 to March- 2014.																																																																																																																																																																											
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		<ul style="list-style-type: none"> ➤ Monsoon of 2014 remained favorable for good crop harvest. ➤ The whole July remained wet with the highest rainfall of 719.0 mm in 25 rainy days. ➤ Total rainfall received was 1594 in 82 rainy days which was higher than the average (1250 mm). ➤ Late rainfall of 67 mm in November was received in 3 rainy days. ➤ Disease pest incidence did not affect the crop considerably. 																																																																																																																																																																											
9	Soil health (Initial)	<ul style="list-style-type: none"> ➤ Organic carbon : 0.57 % ➤ Available N : 315 kg/ha ➤ Available P₂O₅ : 49.78 kg/ha ➤ Available K₂O : 362 kg/ha 																																																																																																																																																																											

10	Summary of results:	<p>The results are given in table AS 42. 1 & 2. Germination % at 45 DAP were recorded significantly highest with variety V₂ (CoVSI 08121) over other varieties. Fertilizer level F₃ (125 % RDN) counted highest germination (48.73) over F₁ and at par with F₂ (100 % RDN). Number of tillers were not significantly influenced due to different varieties at 90 DAP. At 120 and 180 DAP, variety V₄ (CoN 10071) recorded significantly higher no. of tillers over V₁ and V₃ and at par with variety V₂ (CoVSI 08121). The fertilizer level F₃ (125 % RDN) and F₂ (100 % RDN) were equally effective in counting higher tillers and remained at par with each other over F₁. Variety V₄ and V₃ recorded significantly highest NMC (115.97 & 111.81 ha⁻¹) respectively over V₁ and V₂. The fertilizer level F₃ and F₂ recorded highest NMC ha⁻¹ (111.88 & 109.38 ha⁻¹) and remained at par with each other.</p> <p>Significantly highest cane (133.26 t ha⁻¹) yield was noticed with variety V₄ but remained at par with V₃ over V₁ and V₂. CCS yield was not influenced significantly due to varieties. The fertilizer level F₃ recorded significantly higher cane and CCS (130.47 & 16.96 t ha⁻¹) yields over F₁ but at par with F₂ regarding cane yield.</p> <p>Among various quality parameters, pol % juice, pol % cane and CCS % were recorded highest with V₂ and V₁ and remained at par with each other; purity % was highest with V₃ while fibre % was not influenced significantly due to varieties. Fertilizer levels did not show any significant effect on quality parameters. Interaction between variety and fertilizer level was failed to show significant results for above all parameters.</p>
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Table AS 42. 1: Growth, yield parameters, cane and CCS yields of sugarcane as influenced by sugarcane varieties and various fertilizer levels

Treatment	Germination % at 45 DAP	No. of tillers at 90 DAP 000/ha	No. of tillers at 120 DAP 000/ha	No. of tillers at 180 DAP 000/ha	NMC 000/ha at harvest	Cane yield (t/ha)	CCS yield (t/ha)
Variety							
V ₁ -Co 08001	44.18	128.68	152.85	112.78	96.53	116.52	16.06
V ₂ - CoVSI 08121	54.72	136.25	160.28	119.72	100.21	121.04	16.32
V ₃ - CoN 09071	46.60	124.72	159.38	116.04	111.81	127.99	15.74
V ₄ -CoN 10071	42.91	130.97	169.24	126.04	115.97	133.26	15.54
S.Em.±	1.67	5.72	3.34	3.25	3.13	3.06	0.43
C.D. at 5%	4.89	NS	9.81	9.53	9.17	8.97	NS
Fertilizer levels							
F ₁ -75 % of RDN	44.55	120.57	149.17	110.47	97.14	119.32	15.09
F ₂ -100 % of RDN	48.4	131.93	163.80	122.45	109.38	124.32	15.84
F ₃ -125 % RDN	48.73	137.97	168.33	123.02	111.88	130.47	16.98
S. Em. ±	1.44	4.95	2.90	2.81	3.61	3.06	0.37
C.D. at 5%	4.23	NS	8.50	8.25	10.59	8.97	1.09
C.V. %	10.61	13.19	6.25	8.21	10.42	7.36	8.06
Interaction	NS	NS	NS	NS	NS	NS	NS

Table AS 42. 2: Juice quality parameters of sugarcane as influenced by sugarcane varieties and various fertilizer levels

Treatment	Pol (%) juice	Purity (%)	Fibre (%)	Pol (%) cane	C.C.S. (%)
Variety					
V ₁ -Co 08001	19.87	88.80	13.90	15.12	13.78
V ₂ - CoVSI 08121	19.50	88.24	14.13	14.80	13.48
V ₃ - CoN 09071	17.56	90.65	13.92	13.36	12.30
V ₄ -CoN 10071	16.85	88.42	13.85	12.83	11.66
S.Em.±	0.27	0.48	0.10	0.20	0.20
C.D. at 5%	0.79	1.42	NS	0.60	0.57
Fertilizer levels					
F ₁ -75 % of RDN	18.23	89.03	14.01	13.86	12.65
F ₂ -100 % of RDN	18.36	88.88	13.84	13.99	12.74
F ₃ -125 % RDN	18.74	89.16	14.00	14.24	13.02
S. Em. ±	0.24	0.42	0.09	0.18	0.17
C.D. at 5%	NS	NS	NS	NS	NS
C.V. %	4.39	1.63	2.26	4.34	4.59
Interaction	NS	NS	NS	NS	NS

1	Project No.	AS 42												
2	Title	Agronomic evaluation of promising new sugarcane genotypes (plant crop) (midlate group)												
3	Objectives	To work out agronomy of sugarcane genotypes of advanced varietal trial (AVT)												
4	Details of the treatment	<ul style="list-style-type: none"> ➤ Variety (Genotypes) V₁ – CoSnk 08101 V₂ – Co 08009 V₃ – CoN 11073 V₄ – CoN 13073 ➤ Fertilizer levels F₁ - 75 % of recommended dose of N kg/ha F₂ - 100 % of recommended dose of N kg/ha F₃ - 125 % of recommended dose of N kg/ha ➤ Recommended dose : 250-125-125 kg NPK/ha ➤ Spacing : 100 cm ➤ Seed rate : 50000 two eye bud setts ha⁻¹ ➤ Date of planting : 27-01-2014 ➤ Fertilizer applied : As per treatment <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Nutrient</th> <th style="text-align: left;">Basal</th> <th style="text-align: left;">Top dressing</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>15 %</td> <td>85% (In 3 splits 30, 20 & 35 % of RDN)</td> </tr> <tr> <td>P</td> <td>100%</td> <td>-</td> </tr> <tr> <td>K</td> <td>100%</td> <td>-</td> </tr> </tbody> </table> ➤ Date of harvesting : 12-02-2015 	Nutrient	Basal	Top dressing	N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)	P	100%	-	K	100%	-
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P	100%	-												
K	100%	-												
5	Design	RBD (Factorial)												
6	Replications	Three												
7	Plot size	<ul style="list-style-type: none"> ➤ Gross : 6.00m x 6.00m ➤ Net : 4.00m x 4.00m 												
8	Climatic parameters	Given in project no. AS 42 (plant crop)												
9	Soil health (Initial)	<p>Previous crop i.e. plant crop soil data:</p> <ul style="list-style-type: none"> ➤ Organic carbon : 0.57 % ➤ Available N : 315 kg/ha ➤ Available P₂O₅ : 49.78 kg/ha ➤ Available K₂O : 362 kg/ha 												

10	Summary of results:	<p>The results are given in table AS 42. 1 & 2. Germination % at 45 DAP was not significantly influenced due to different varieties and fertilizer levels. Number of tillers were recorded significantly highest with variety V₄ (CoN 13073) over V₁ (CoSnk 08101) and V₂ (Co 08009) and at par with V₃ (CoN 11073) & remained at par with each other at all the three growth stages. The fertilizer level F₃ (125 % RDN) recorded significantly higher tillers over F₁ & remained at par with F₂ (100 % RDN) at all the three growth stages.</p> <p>Significantly highest NMC (113.96 ha⁻¹) and cane (127.78 t ha⁻¹) and yield were recorded with V₄ (CoN 13073) over V₁ and V₂ & remained at par with V₃. CCS yield was not influenced significantly due to varieties. The fertilizer level F₃ (125 % RDN) failed to reach the level of significance on NMC and CCS yield while cane (125.68 t ha⁻¹) yield recorded significantly highest with F₂ over F₁ and remained at par with F₃.</p> <p>Almost all the quality parameters were not significantly influenced due to varieties except pol % juice and pol % cane which recorded highest with variety V₂ (Co 08009) over other varieties. The various fertilizer levels failed to show significant effect on quality.</p> <p>Interaction between various varieties & fertilizer levels was observed non significant for all these parameters.</p>
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Table AS 42. 1: Growth, yield parameters, cane and CCS yield of sugarcane as influenced by sugarcane varieties and various fertilizers levels

Treatment	Germination % at 45 DAP	No. of tillers at 90 DAP 000/ha	No. of tillers at 120 DAP 000/ha	No. of tillers at 180 DAP 000/ha	NMC 000/ha at harvest	Cane yield (t/ha)	CCS yield (t/ha)
Variety							
V ₁ -CoSnk 08101	47.16	145.21	164.58	135.63	96.53	114.58	14.30
V ₂ - Co 08009	53.14	147.85	169.65	138.33	98.89	120.14	15.45
V ₃ - CoN 11073	56.74	156.32	175.42	146.04	111.74	123.26	15.26
V ₄ -CoN 13073	58.32	160.83	182.57	151.39	113.96	127.78	16.00
S.Em.±	1.87	4.15	3.89	3.94	3.55	2.45	0.46
C.D. at 5%	NS	12.16	11.40	11.55	10.46	7.20	NS
Fertilizer levels							
F ₁ -75 % of RDN	53.19	144.64	160.16	134.48	100.52	117.86	14.72
F ₂ -100 % of RDN	54.45	157.19	176.98	148.59	109.69	125.68	15.91
F ₃ -125 % RDN	53.87	155.83	182.03	145.47	105.63	120.78	15.13
S. Em. ±	1.62	3.59	3.37	3.41	3.09	2.13	0.40
C.D. at 5%	NS	10.53	9.88	10.00	NS	6.23	NS
C.V. %	10.44	8.16	6.74	8.27	10.17	6.06	9.11
Interaction	NS	NS	NS	NS	NS	NS	NS

Table AS 42. 2: Juice quality parameters of sugarcane as influenced by sugarcane varieties and various fertilizer levels

Treatment	Pol (%) juice	Purity (%)	Fibre (%)	Pol (%) cane	C.C.S. (%)
Variety					
V ₁ -Co Snk 08101	17.93	89.47	13.92	13.64	12.48
V ₂ - Co 08009	19.10	88.15	14.16	14.49	12.86
V ₃ - CoN 11073	17.68	89.35	14.04	13.43	12.38
V ₄ -CoN 13073	17.96	90.02	13.98	13.66	12.52
S.Em.±	0.32	0.60	0.10	0.25	0.28
C.D. at 5%	0.95	NS	NS	0.73	NS
Fertilizer levels					
F ₁ -75 % of RDN	17.80	89.23	13.99	13.53	12.49
F ₂ -100 % of RDN	18.18	88.75	14.06	13.80	12.66
F ₃ -125 % RDN	18.53	89.76	14.01	14.08	12.53
S. Em. ±	0.28	0.52	0.09	0.22	0.28
C.D. at 5%	NS	NS	NS	NS	NS
C.V. %	5.36	2.01	2.21	5.40	6.62
Interaction	NS	NS	NS	NS	NS

1	Project No.	AS 64												
2	Title	Response of sugarcane to different plant nutrients in varied agro ecological situations												
3	Objectives	➤ To study the differential response of sugarcane crop to different nutrients												
4	Details of the treatment	<ul style="list-style-type: none"> ➤ T₁ Control (No fertilizer) ➤ T₂ N ➤ T₃ NP ➤ T₄ NPK ➤ T₅ NPK + S ➤ T₆ NPK + Zn ➤ T₇ NPK + Fe ➤ T₈ NPK + Mn ➤ T₉ NPK + S + Zn ➤ T₁₀ NPK + S + Zn + Fe ➤ T₁₁ NPK + S + Zn + Fe + Mn ➤ T₁₂ Soil test based fertilizer application ➤ T₁₃ FYM @ 25 t ha⁻¹ ➤ T₁₄ Biocompost @ 12 t ha⁻¹ <ul style="list-style-type: none"> ➤ Date of planting : 18-12-2013 ➤ Variety : CoN 05071 ➤ Spacing : 90 cm ➤ Seed rate : 50000 two eye bud setts ha⁻¹ ➤ Fertilizer applied : As per treatment <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Nutrient</th> <th style="text-align: left;">Basal</th> <th style="text-align: left;">Top dressing</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>15 %</td> <td>85% (In 3 splits 30, 20 & 35 % of RDN)</td> </tr> <tr> <td>P</td> <td>100%</td> <td>-</td> </tr> <tr> <td>K</td> <td>100%</td> <td>-</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ➤ Date of harvesting : 27-02-2015 	Nutrient	Basal	Top dressing	N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)	P	100%	-	K	100%	-
Nutrient	Basal	Top dressing												
N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)												
P	100%	-												
K	100%	-												
5	Design	RBD												
6	Replications	Three												
7	Plot size	<ul style="list-style-type: none"> ➤ Gross : 8.00 m x 5.40 m ➤ Net : 6.00 m x 3.6 m 												
8	Climatic parameters	Given in project no. AS 42 (plant crop)												

9	Soil health (Initial)	<ul style="list-style-type: none"> ➤ Organic carbon : 0.62% ➤ Available N : 508 kg/ha ➤ Available P₂O₅ : 69.52 kg/ha ➤ Available K₂O : 606 kg/ha
10	Summary of results:	<p>The data pertaining to initial soil fertility status, growth yield parameters and after harvest soil status are given in table AS 64. 1 to 4. Significantly higher tiller count at 90 DAP was recorded with treatment T₁₂ (soil test based fertilizer application) over control and remained at par with T₁₁. At 120 DAP, significantly higher no. of tillers was observed with T₁₂ over control and at par with T₁₁, T₁₀, T₉, T₇, T₅, T₄, T₃ and T₁ similarly at 180 DAP also it was found highest with T₁₂ over control and was at par with almost the treatments except T₁ and T₁₃. Significantly highest plant height at 180 DAP was noticed with T₁₂ over control.</p> <p>Significantly highest (112.79 thousand ha⁻¹) and lowest (84.51 thousand ha⁻¹) NMC was noticed under T₁₂ and T₁ respectively. Significantly highest millable cane length was recorded with T₁₂ over control and remained at par with almost all the treatments except T₁₃ and T₁₄. Difference for cane length and girth were not achieved level of significance.</p> <p>Cane yield (127.04 t ha⁻¹) was recorded significantly highest with T₁₂ and was at par with T₄, T₅ and T₆. CCS yield (17.50 t ha⁻¹) was also noticed significantly highest with T₁₂ and remained at par with T₄, T₅, T₆, T₇, T₈, T₁₀ and T₁₁. Different juice qualities parameters were not significantly influenced due to various nutrient management treatments.</p> <p>There was no significant difference was observed due to various nutrients on soil pH, OC % and available phosphorus, potassium, manganese and zinc. Significantly highest OC % and nitrogen was recorded with T₅ over T₁ and at par with T₁₀, T₁₁ and T₁₂. Available nitrogen was noticed highest with T₅ and at par with T₁, T₂, T₆, and T₁₃. Available S was observed significantly highest in T₁₁ over control while available Fe with T₁.</p>

Trial series: AS-64 Response of sugarcane to different plant nutrients in varied agro ecological situations

Table AS 64. 1: Initial Soil Analysis:

Parameter	Soil value
pH (1:10)	7.60
EC (1:10) dsm ⁻¹	0.396
Organic carbon (%)	0.62
Available N (kg/ha)	508
Available P ₂ O ₅ (kg/ha)	69.52
Available K ₂ O (kg/ha)	606
Available S (ppm)	3.36
Fe (ppm)	1.608
Mn (ppm)	0.084
Zn (ppm)	0.102

Application of Soil test based fertilizer:

1. N - Recommended dose (RD) of nitrogen only i.e. 250 kg N/ha
2. P - Decrease RDP by 50 % i.e. 62.5 kg P₂O₅/ha
3. K - Decrease RDK by 50 % i.e. 62.5 kg K₂O/ha
4. S - 20 kg/ha
5. Fe - 50 kg/ha
6. Mn - 40 kg/ha
7. Zn - 25 kg/ha

Table AS 64.2 Growth and yield parameters of sugarcane as influenced by different plant nutrients

Treatment	No. of tillers at 90 DAP 000/ha	No. of tillers at 120 DAP 000/ha	No. of tillers at 180 DAP 000/ha	Plant height (cm) at 180 DAP	NMC 000 ha⁻¹	Millable length (cm) at harvest	Millable Girth (cm) at harvest	Cane yield (t/ha)	CCS yield (t/ha)
T ₁	113.68	119.85	110.22	129.51	84.51	190.59	2.63	53.60	7.43
T ₂	129.21	148.65	126.85	132.30	92.03	236.16	2.61	95.62	12.59
T ₃	129.75	161.43	133.61	135.62	100.34	239.90	2.72	105.37	14.40
T ₄	147.89	164.63	142.33	151.23	99.09	235.67	2.69	120.50	16.63
T ₅	137.10	154.16	137.18	134.87	95.70	227.88	2.74	112.74	15.17
T ₆	140.94	151.20	136.74	141.69	94.70	229.94	2.75	113.22	15.74
T ₇	145.69	161.53	136.91	153.65	99.33	241.97	2.77	109.56	15.20
T ₈	137.86	152.40	141.16	156.48	94.94	239.80	2.76	107.64	15.23
T ₉	153.36	153.18	134.12	135.44	99.32	231.92	2.75	110.47	14.50
T ₁₀	142.07	158.51	141.11	159.06	94.91	230.83	2.75	111.05	14.97
T ₁₁	171.92	165.77	142.85	140.02	99.18	247.02	2.77	110.20	15.06
T ₁₂	179.77	175.30	149.52	164.44	112.79	256.96	2.76	127.04	17.52
T ₁₃	138.78	137.75	123.93	124.30	96.13	182.84	2.70	72.72	10.15
T ₁₄	143.83	142.77	126.82	131.24	91.63	213.94	2.71	76.05	10.95
S.Em ±	5.88	7.75	8.25	8.43	4.28	13.56	0.06	4.94	0.94
C.D.at 5%	17.08	22.53	23.97	24.52	12.44	39.42	NS	14.37	2.73
C.V.%	7.08	8.75	10.62	10.28	7.66	10.26	3.80	8.41	13.04

Table AS 64.3 Juice quality parameters of sugarcane as influenced by different plant nutrients

Treatment	CCS %	Pol % juice	Purity %	Pol % cane	Fibre %
T ₁	13.87	19.83	90.48	14.96	14.56
T ₂	13.17	18.91	89.77	14.26	14.58
T ₃	13.67	19.59	89.98	14.76	14.65
T ₄	13.80	19.72	90.66	14.87	14.57
T ₅	13.46	19.26	90.35	14.53	14.55
T ₆	13.90	20.00	89.30	15.06	14.71
T ₇	13.87	19.82	90.62	14.97	14.49
T ₈	14.15	20.36	89.17	15.37	14.50
T ₉	13.13	18.76	90.60	14.12	14.72
T ₁₀	13.48	19.39	89.24	14.61	14.67
T ₁₁	13.67	19.51	90.78	14.68	14.77
T ₁₂	13.79	19.78	90.05	14.89	14.71
T ₁₃	13.96	20.13	88.85	15.20	14.47
T ₁₄	14.40	20.68	89.64	15.65	14.31
S.Em ±	0.52	0.75	0.86	0.57	0.17
C.D.at 5%	NS	NS	NS	NS	NS
C.V.%	6.56	6.58	1.65	6.67	1.97

Table AS 64.4: Soil properties after harvest of crop as influenced by different plant nutrients

Treatment	pH	EC (1:2.5) dsm⁻¹	OC%	Available N (kg/ha)	Available P₂O₅ (kg/ha)	Available K₂O (kg/ha)	Available S (ppm)	Available Fe (ppm)	Available Mn (ppm)	Available Zn (ppm)
T ₁	7.60	0.16	0.55	286.33	38.88	605.00	5.78	17.41	9.85	1.64
T ₂	7.86	0.12	0.54	269.67	41.82	567.67	5.42	16.33	9.42	1.65
T ₃	7.80	0.10	0.40	241.33	42.67	503.67	5.88	15.24	9.90	1.72
T ₄	7.83	0.12	0.43	239.67	43.71	537.33	6.01	16.91	9.75	1.55
T ₅	7.75	0.13	0.78	321.67	45.77	596.00	6.32	14.99	9.55	1.64
T ₆	7.73	0.14	0.58	262.00	47.07	491.33	5.57	16.15	9.72	1.45
T ₇	7.88	0.10	0.46	221.33	43.67	546.33	6.32	14.97	9.45	1.39
T ₈	7.84	0.13	0.51	221.67	47.25	568.67	6.19	16.84	9.45	1.47
T ₉	7.85	0.12	0.49	216.00	43.47	514.33	7.16	15.29	9.37	1.22
T ₁₀	7.98	0.11	0.63	185.00	44.67	556.33	7.23	16.40	9.27	1.41
T ₁₁	7.91	0.12	0.63	228.00	51.61	593.00	7.76	16.01	9.40	1.28
T ₁₂	8.04	0.11	0.67	232.33	53.51	571.33	5.42	16.58	9.59	1.35
T ₁₃	7.91	0.14	0.58	272.67	51.80	610.67	5.61	14.86	9.62	1.31
T ₁₄	7.99	0.15	0.58	202.67	49.07	580.67	4.28	13.84	9.34	1.52
S.Em ±	0.09	0.01	0.06	20.96	3.27	52.21	0.51	0.68	0.17	0.12
C.D.at 5%	0.26	0.04	0.17	60.92	NS	151.76	1.49	1.96	0.51	0.34
C.V.%	1.99	19.25	18.19	14.94	12.29	16.14	14.65	7.38	3.17	13.95
Initial	7.60	0.396	0.62	508	69.52	606	3.36	1.608	0.084	0.102

1	Project No.	AS 66												
2	Title	Priming of cane node for accelerating germination												
3	Objectives	<ul style="list-style-type: none"> ➤ To find out suitable cane node priming technique ➤ To assess the effect of cane node on acceleration of germination 												
4	Details of the treatment	<ul style="list-style-type: none"> ➤ T₁- Un-primed cane node ➤ T₂- Treating cane node in hot water in 50⁰ C for 2 hours ➤ T₃- Treating cane node in hot water in (50⁰) urea solution (3%) for 2 hours ➤ T₄- Priming cane node with cattle dung, cattle urine and water in 1:2:5 ratio ➤ T₅- Conventional 3 bud sett planting ➤ *T₆- Primed and sprouted can node (incubated for four days after priming) <p>* Put the single cane node in the slurry of cattle dung, cattle urine and water for 15 minutes. Take out the buds and put in decomposed FYM and cover it with sugarcane trash for 4-5 days for sprouting</p> <ul style="list-style-type: none"> ➤ Date of planting : 27-02-2014 ➤ Variety : CoN 08072 ➤ Spacing : 90 cm ➤ Seed rate : As per treatment ➤ Fertilizer applied : 250-125-125 kg NPK ha⁻¹ <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Nutrient</th> <th style="text-align: left;">Basal</th> <th style="text-align: left;">Top dressing</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>15 %</td> <td>85% (In 3 splits 30, 20 & 35 % of RDN)</td> </tr> <tr> <td>P</td> <td>100%</td> <td>-</td> </tr> <tr> <td>K</td> <td>100%</td> <td>-</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ➤ Date of harvesting : 30-01-2015 	Nutrient	Basal	Top dressing	N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)	P	100%	-	K	100%	-
Nutrient	Basal	Top dressing												
N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)												
P	100%	-												
K	100%	-												
5	Design	RBD												
6	Replications	Four												
7	Plot size	<ul style="list-style-type: none"> ➤ Gross : 6.00 m x 4.50 m ➤ Net : 4.00 m x 2.70 m 												
8	Climatic parameters	Given in project no. AS 42 (plant crop)												
9	Soil health (Initial)	<ul style="list-style-type: none"> ➤ Organic carbon : 0.54 % ➤ Available N : 372 kg/ha ➤ Available P₂O₅ : 35.44 kg/ha ➤ Available K₂O : 410 kg/ha 												

10	Summary of results:	<p>The data related to growth, yield and quality parameters are presented in Table AS 66. 1 to 3. Significantly highest germination % was recorded with treatment T₆ (Primed and sprouted cane node (incubated for four days after priming)) at 10, 20, 30 and 40 DAP over unprimed cane node. At 60 DAP, significantly highest shoot was noticed with T₆ and remained at par with all the treatments except T₁ at 60 DAP while at 90 DAP it was at par with T₄ and T₃. Different cane node priming techniques failed to reach the level of significance on no. of shoots at 120 and 150 DAP. Significantly higher per clump shoots were found with T₆ at 60 & 120 DAP while at 90 & 150 DAP it found highest with T₄ over unprimed cane node and remained at par with T₆.</p> <p>The highest and lowest NMC (115.28 & 94.10 thousand ha⁻¹) was noticed with T₆ (Primed and sprouted can node (incubated for four days after priming)) over unprimed cane node and at par with T₄ (Priming cane node with cattle dung, cattle urine and water in 1:2.5 ratio). Cane length was significantly highest with T₆ over unprimed cane node and at par with T₄ and T₅. There was no significant difference was observed due to various priming techniques on girth and single cane weight. Significantly highest and lowest cane yield was recorded with T₄ (115.92 t ha⁻¹) and T₁ (95.06 t ha⁻¹) respectively while CCS yield was recorded significantly highest with T₄ over unprimed cane node and at par with T₆. Almost all the quality parameters were not influenced due to priming treatment except purity % which recorded highest with T₁ and remained at par with T₃, T₄ and T₆.</p>
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Table No. AS 66. 1: Growth parameters as influenced by cane node priming technique

Treatment	Germination % at 10 DAP	Germination % at 20 DAP	Germination % at 30 DAP	Germination % at 40 DAP	Shoot 000/ha at 60 DAP	Shoot 000/ha at 90 DAP	Shoot 000/ha at 120 DAP	Shoot 000/ha at 150 DAP
T ₁	26.98	36.80	45.74	57.53	108.66	103.72	137.63	151.95
T ₂	28.90	41.07	47.36	63.24	138.01	107.91	149.65	155.60
T ₃	30.82	43.36	52.25	64.78	149.63	114.91	155.84	158.66
T ₄	32.96	45.81	53.82	69.40	144.77	112.16	154.55	156.10
T ₅	26.97	38.88	46.61	56.26	135.15	106.40	146.90	152.51
T ₆	41.03	50.87	60.98	75.49	154.07	119.20	160.99	163.63
S.Em ±	1.99	2.48	2.50	3.47	7.12	2.83	9.42	11.17
C.D.at 5%	5.98	7.48	7.55	10.45	21.47	8.52	NS	NS
C.V.%	12.70	11.60	9.80	10.76	10.30	5.10	12.48	14.28

Table No. AS 66. 2: Growth parameters as influenced by cane node priming technique

Treatment	Per clump shoot(5 plant average) at				NMC 000/ha at harvest	Cane length (cm) at harvest	Cane girth (cm) at harvest	Single cane weight (kg) at harvest	Cane yield (t/ha)	CCS yield (t/ha)
	60 DAP	90 DAP	120 DAP	150 DAP						
T ₁	1.57	2.42	3.41	2.04	94.10	217.49	2.11	1.06	95.06	12.00
T ₂	2.13	2.70	3.76	3.36	96.35	227.74	2.15	1.11	97.57	12.54
T ₃	2.46	3.59	4.25	3.45	99.31	238.59	2.32	1.08	101.51	12.98
T ₄	1.83	5.01	5.44	4.20	111.46	247.82	2.26	1.10	115.92	14.81
T ₅	2.60	3.81	4.83	3.82	91.49	227.81	2.31	1.09	95.60	12.03
T ₆	2.98	4.99	6.36	4.17	115.28	248.71	2.33	1.13	107.96	14.14
S.Em ±	0.08	0.18	0.20	0.11	5.29	7.29	0.09	0.04	4.72	0.74
C.D.at 5%	0.25	0.53	0.59	0.32	15.94	21.96	NS	NS	14.23	2.23
C.V.%	7.26	9.38	8.36	6.12	10.43	6.21	7.75	7.89	9.23	11.33

Table No. AS 66. 3: Juice quality parameters as influenced by cane node priming technique

Treatment	Brix	CCS %	Pol % juice	Purity %	Fibre %	Pol % cane
T ₁	20.35	12.62	18.16	89.24	14.31	13.74
T ₂	21.63	12.85	18.75	86.69	14.22	14.21
T ₃	20.73	12.79	18.43	88.91	14.21	13.97
T ₄	20.98	12.78	18.49	88.66	14.06	14.04
T ₅	20.63	12.58	18.19	88.17	14.23	13.78
T ₆	21.33	13.10	18.91	88.65	14.08	14.35
S.Em ±	0.39	0.27	0.38	0.29	0.11	0.28
C.D.at 5%	NS	NS	NS	0.87	NS	NS
C.V.%	3.68	4.30	4.08	0.66	1.54	4.00

1	Project No.	AS 68												
2	Title	Impact of integrated application of organics and inorganics in improving soil health and sugarcane												
3	Objectives	➤ To study the differential response of sugarcane crop to different nutrients												
4	Details of the treatment	<ul style="list-style-type: none"> ➤ T₁: No organic + 50 % RDF ➤ T₂: No organic + 100 % RDF ➤ T₃: No organic + Soil test based recommendation ➤ T₄: Application of FYM/Compost@ 20 tonnes/ha + 50 % RDF (inorganic source) ➤ T₅: Application of FYM/Compost@20 tonnes /ha + 100 % RDF (inorganic source) ➤ T₆: Application of FYM/Compost@20 tonnes /ha + inorganic nutrient application based on soil test (rating chart) ➤ T₇: Application of FYM/Compost@10 tonnes /ha +biofertilizer (<i>Azotobacter / Acetobacter + PSB</i>) + 50 % RDF ➤ T₈: Application of FYM/Compost@10 tonnes /ha +biofertilizer (<i>Azotobacter / Acetobacter + PSB</i>) + 100 % RDF ➤ T₉: Application of FYM/Compost@10 tonnes /ha +biofertilizer (<i>Azotobacter / Acetobacter + PSB</i>) + soil test basis (NPK application) <ul style="list-style-type: none"> ➤ Date of planting : 18-12-2013 ➤ Variety : CoN 05071 ➤ Spacing : 90 cm ➤ Seed rate : 50000 two eye bud setts ha⁻¹ ➤ Fertilizer applied : As per treatment <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Nutrient</th> <th style="text-align: left;">Basal</th> <th style="text-align: left;">Top dressing</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>15 %</td> <td>85% (In 3 splits 30, 20 & 35 % of RDN)</td> </tr> <tr> <td>P</td> <td>100%</td> <td>-</td> </tr> <tr> <td>K</td> <td>100%</td> <td>-</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ➤ Date of harvesting : 27-02-2015 	Nutrient	Basal	Top dressing	N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)	P	100%	-	K	100%	-
Nutrient	Basal	Top dressing												
N	15 %	85% (In 3 splits 30, 20 & 35 % of RDN)												
P	100%	-												
K	100%	-												

5	Design	RBD
6	Replications	Three
7	Plot size	<ul style="list-style-type: none"> ➤ Gross : 6.00 m x 5.40 m ➤ Net : 4.00 m x 3.6 m
8	Climatic parameters	Given in project no. AS 42 (plant crop)
9	Soil health (Initial)	<ul style="list-style-type: none"> ➤ Organic carbon : 0.24% ➤ Available N : 301 kg/ha ➤ Available P₂O₅ : 83.84 kg/ha ➤ Available K₂O : 282 kg/ha
10	Summary of results:	<p>The data pertaining to initial soil fertility status, growth, yield parameters and after harvest soil status are given in table AS 64. 1 to 4. Significantly higher germination % was recorded with application of FYM/Compost@10 tonnes /ha +biofertilizer (<i>Azotobacter</i> / <i>Acetobacter</i> + <i>PSB</i>) + soil test basis (NPK application) (T₉) over 50 % RDF (T₁) at 30 and 45 DAP. Significantly higher tiller count at 120 and 150 DAP was recorded with treatment T₉ over T₁. However it remained at par with T₃, T₄, T₆ and T₇ at 120 DAP and T₃ and T₆.</p> <p>Different treatments failed to reach the level of significance on NMC at harvest. Millable cane length was recorded significantly highest was with T₉ over T₁ and remained at par T₆, T₇ and T₈. There was no significant difference was observed due to various treatments on cane girth. Significantly highest single cane weight was recorded with T₉ over T₁ and remained at par with T₆ and T₇.</p> <p>Cane yield (134.01 t ha⁻¹) was recorded significantly highest with T₉ over T₁ and was at par with T₆. CCS yield (16.16 t ha⁻¹) was also counted highest with T₉ over T₁ and remained at par with all the treatments except T₃. Various qualities parameters were not influenced significantly due to different nutrient management treatments at 10 and 12 month.</p> <p>There was no significant difference was observed due to various inorganic and organic treatments on soil pH, OC %, available nitrogen and phosphorus. Available K₂O was observed significantly highest in T₁ over T₆, T₇, T₈ and T₉. Significantly highest and lowest BD was recorded with T₁ and T₉ respectively however it remained at par with T₂.</p>

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)	8.67
EC (1:10) dsm ⁻¹	0.280
Organic carbon (%)	0.240
Available N (kg/ha)	301
Available P ₂ O ₅ (kg/ha)	83.84
Available K ₂ O (kg/ha)	282
Bulk density (Mg M ⁻³)	1.22
Infiltration rate (cm h ⁻¹)	1

Application of Soil test based fertilizer:

RDF-250-125-125 kg NPK/ha for plant crop

1. N - Recommended dose (RD) of nitrogen only i.e. 250 kg N/ha
2. P - Decrease RDP by 50 % i.e. apply 62.5 kg P₂O₅/ha
3. K - Decrease RDK by 25 % i.e. apply 93.75 kg K₂O/ha

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)	No. of tillers at 150 DAP (000/ha)	Number of Millable cane at harvest (000/ha)	Millable cane length (cm) at harvest	Millable Girth (cm) at harvest	Single cane weight (kg)	Cane yield (t/ha)	CCS yield (t/ha) at harvest
T ₁	44.39	47.92	138.89	144.44	97.83	190.51	2.63	1.12	107.21	14.66
T ₂	48.81	51.48	141.20	146.07	100.63	234.16	2.71	1.40	113.46	15.74
T ₃	48.62	50.90	164.58	165.74	99.13	230.05	2.73	1.45	104.60	14.82
T ₄	46.66	55.30	150.93	157.87	104.76	235.67	2.67	1.41	117.77	15.78
T ₅	47.19	52.28	142.36	147.92	98.90	224.51	2.66	1.51	116.92	16.44
T ₆	47.84	60.15	171.99	175.93	104.10	242.98	2.68	1.55	122.69	17.79
T ₇	47.69	49.68	151.62	157.41	99.85	238.38	2.69	1.54	118.79	16.59
T ₈	48.58	53.58	143.52	149.54	103.31	233.25	2.71	1.46	117.88	15.44
T ₉	54.34	63.99	180.32	187.04	110.81	259.28	2.74	1.76	134.01	18.39
S.Em ±	3.24	3.09	11.42	9.09	4.79	11.43	0.09	0.08	4.94	0.83
C.D.at 5%	9.72	9.27	34.25	27.25	14.36	34.25	0.25	0.24	14.81	2.49
C.V.%	11.64	9.93	12.85	9.90	8.12	8.53	5.47	9.56	7.31	9.93

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	20.63	11.07	17.12	83.19	13.09	13.57	22.07	13.67	19.67	89.15	14.90	14.28
T ₂	22.02	12.34	18.60	84.48	14.18	13.75	22.87	13.87	20.10	87.92	15.22	14.28
T ₃	22.93	12.76	19.13	83.42	14.53	14.06	23.27	14.17	20.50	88.12	15.47	14.56
T ₄	21.82	12.24	18.11	83.11	13.81	13.80	21.50	13.40	19.25	89.45	14.52	14.58
T ₅	22.38	12.61	18.90	84.53	14.37	13.98	23.00	14.06	20.33	88.36	15.34	14.52
T ₆	22.50	12.82	19.16	85.18	14.60	13.83	23.20	14.50	20.81	89.72	15.68	14.67
T ₇	22.91	12.75	18.98	82.86	14.47	13.75	22.77	13.97	20.17	88.60	15.22	14.55
T ₈	22.06	12.60	18.32	83.18	14.02	13.47	21.00	13.10	18.81	89.67	14.19	14.54
T ₉	21.74	12.05	18.12	83.29	13.85	13.55	22.17	13.72	19.75	89.14	14.98	14.15
S.Em ±	0.70	0.54	0.60	1.12	0.46	0.24	0.52	0.31	0.43	0.82	0.33	0.16
C.D.at 5%	2.10	1.62	1.79	3.36	1.39	0.71	1.55	0.92	1.29	2.47	0.98	0.49
C.V.%	5.49	7.58	5.58	2.32	5.70	2.99	3.98	3.85	3.74	1.60	3.76	1.94

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)	Available P₂O₅ (kg/ha)	Available K₂O (kg/ha)	BD g/cc
T ₁	7.83	0.14	0.72	475.33	40.55	630.67	1.75
T ₂	7.72	0.11	0.68	517.67	44.00	602.00	1.75
T ₃	7.68	0.13	0.66	220.67	43.04	589.33	1.71
T ₄	7.81	0.14	0.82	329.67	45.00	589.67	1.67
T ₅	7.77	0.14	0.77	286.33	42.18	604.33	1.67
T ₆	7.74	0.14	0.82	479.33	42.57	543.00	1.65
T ₇	7.58	0.17	0.79	313.67	43.28	539.67	1.64
T ₈	7.72	0.14	0.80	239.00	45.67	539.67	1.64
T ₉	7.75	0.16	0.84	248.00	50.21	469.00	1.62
S.Em ±	0.11	0.01	0.06	93.90	1.77	28.24	0.02
C.D.at 5%	NS	NS	NS	NS	NS	84.66	0.06
C.V.%	2.46	15.91	12.57	47.07	6.94	8.62	2.14
Initial	8.67	0.280	0.240	301	83.84	282	1.22