AICRP(Sugarcane)

Annual report for the year 2014-15

AGRONOMY
Regional Agricultural Research Station,
Anakapalle

Rainfall, Mean Temperatures and RH during crop growth period of 2014-15 at Regional Agricultural Research Station, Anakapalle.

Month & Year	Rainfall mm	No. of Rainy Days	Temperature (ºC)		R.H%		B.S.S.H	Evaporation (m.m)
			Max	Min	F.N	A.N		
January, 2014	0.0	0	29.5	14.6	94	52	6.1	2.9
February, 2014	0.0	0	31.1	14.1	94	44	7.6	3.9
March, 2014	0.0	0	34.6	18.2	88	41	7.3	5.1
April, 2014	0.0	0	37.0	22.2	85	49	6.9	5.8
May, 2014	115.8	6	36.7	22.9	84	58	7.4	5.5
June, 2014	49.0	4	37.8	24.4	84	54	5.1	5.3
July, 2014	100.4	8	33.2	22.8	94	73	2.0	2.8
August, 2014	255.6	13	33.6	22.2	96	75	4.5	3.2
September, 2014	116.0	8	33.0	22.1	93	68	4.5	3.5
October, 2014	**316.4**	**10**	32.6	21.4	88	61	5.3	3.8
November, 2014	30.6	3	31.9	19.8	86	53	5.3	3.2
December, 2014	25.8	2	30.9	17.6	84	46	5.8	3.5
Total/Mean	1009.6	54	33.5	20.2	89	56	5.6	48.4

Hud -Hud cyclone occurred on 12.10.2014 caused damage to sugarcane experimental fields on account of gales of more than 260 kmph coupled with heavy down pour of rain (23.1 cm).

AGRONOMY

I. V. Project No : AS 42

VI. Project Title : Agronomic evaluation of new promising sugarcane genotypes (Mid late) under irrigated conditions.

VII. Serial number of the year of experimentation : II year

VIII. Location : Regional Agricultural Research Station, Anakapalle

IX. Objectives : To work out optimum nutrient requirement of sugarcane varieties from advanced varietal trial.

X. Technical programme on which the report is based : Project Coordinator, AICRP on Sugarcane, Agronomy / Soil Science sub-committee. Technical Programme of work for the year 2014-15 finalized during the workshop of AICRP (Sugarcane) held at Andhra University, ANGRAU, Visakhapatnam on 25th and 26th October, 2013.

a. Treatments :

Varieties : Four
- V1: 2004A104
- V2: 2007A177
- V3: 2007A126
- V4: Co 7219

Nitrogen levels : Three
- F1: 75% of the recommended dose of N (84Kg/ha)
- F2: 100% of the recommended dose of N(112 Kg/ha)
- F3: 125% of the recommended dose of N(140 Kg/ha)

b. Design : Factorial RBD

c. Replications : Three

d. Plot size : 8m x 4.8m (6 rows)

e. Manuring : N as per the treatments applied in two equal splits at 45 and 90 days after planting. P_2O_5 & K_2O as per the recommended dose were applied as basal at the time of planting.

f. Irrigations : Irrigations were given once in 6 days during formative phase till the onset of monsoon rains and once in 21 days during maturity phase from November till harvest.

g.Date ofplanting : 23.3.2014

h. Date of harvesting : 26.2.2015

i. Designation and name of the Participants :
1. Dr. V. Gouri, Scientist (Agronomy)
2. Dr.T.Chitkala Devi, Principal Scientist (Agronomy)
3. Dr.K.V.Ramana Murthy, Principal Scientist (Agronomy)
4. Dr. MBGS. Kumari, Scientist (Agronomy)
5. Dr. T. Sreelatha, Senior Scientist (Soil Science)
6. Dr.M.Bharata Lakshmi, Principal Scientist (Sugarcane)i/c

j. Year of trial : II year

k. Results recorded previously : During 2013-14 season application of 'N' at 125% recommended dose registered significantly higher cane yield of 85.1 t/ha than lower levels of 75% (74.1 t/ha) and 100% (78.7 t/ha) recommended nitrogen. Among the three new mid late genotypes under test 2007A126 proved superior (84.1 t/ha) to 2004A104 (76.1 t/ha) and 2007A177 ((68.0 t/ha). Due to heavy rainfall (573.6 mm) received during the month of October when crop is in grand growth and maturity phase the experimental field was subjected to water logging and the crop was lodged, under such abnormal situation. The check variety Co 7219 performed better and recorded higher cane yield (88.9 t/ha) than test varieties.

l. Data recorded during the year:

Initial Soil Analysis:

Initial soil analysis was done. Soil of the experimental site was neutral in pH (7.122), normal in E.C(0.238dSm^{-1}) low in organic carbon (0.61%), low in available nitrogen (198 kg N /ha), medium in available phosphorus (47.9 kg/ha) and high in available potassium (313 kg / K_2O /ha).

Germination:

Germination per cent was recorded at 35 days after planting expressed in % and presented in table-1. Germination percentage did not vary significantly due to application of different doses of nitrogen fertilizers. Among the varieties 2007A126 recorded significantly higher germination percentage (77.2) followed by 2004A104 (69.4) than the check variety Co7219 (66.3). 2007A177 recorded significantly lower germination (60.8%).

Tiller Population at 150 DAP:

Tiller population at 150 days after planting varied significantly with mid late sugarcane genotype and levels of nitrogen. Among different new mid late sugarcane genotypes 2007A126 and 2004A104 recorded significantly higher number of tillers (Table-1). Application of nitrogen at 125% recommended dose registered significantly higher number of tillers (1,42,664/ha) as compared to 75% (1,35,938/ha) and 100% (1,41,991/ha) recommended nitrogen.

Number of millable canes/ha:

Significant differences in number of millable canes at harvest were observed due to different sugarcane genotypes and levels of nitrogen nutrient (Table-1). Application of nitrogen at 125% recommended dose registered significantly higher number of millable canes (63,091/ha) than 100% (60,981/ha) recommended nitrogen. Significantly lowest number of millable canes were recorded with the application of 75% (59,244/ha) recommended dose. Among the new genotypes 2004A104 (64,156/ha) had higher number of millable canes than 2007A126(59,317) and 2007A177(52,291/ha). How ever the check variety Co7219 recorded 52,291 millable canes /ha.

Juice sucrose (%):

Cane juices were analyzed for sucrose content at harvest (Table – 1). Percent juice sucrose did not vary significantly both with sugarcane genotypes and application of different nitrogen doses.

Commercial cane sugar(%):

Commercial cane sugar percent was calculated treatment wise. Commercial cane sugar percent did not vary with application of different doses of nitrogen fertilizers and also with different early sugarcane genotypes. However among genotypes, the check variety Co7219 recorded higher CCS percentage (12.6) as compared to new genotypes under study.

Cane yield (t/ha):

Cane yield per plot was recorded at harvest expressed in t/ha and presented in Table 1. Cane yield of new mid late sugarcane genotypes under irrigated conditions varied significantly due to different N levels. Application of nitrogen at 125% recommended dose registered significantly higher cane yield of 60.5 t/ha than lower levels of 75% (54.1 t/ha) and 100% (56.2 t/ha) recommended nitrogen. Among the new mid late genotypes under test, 2004A104 (59.9 t/ha) proved significantly superior over 2007A126 (54.7 t/ha) and 2007A177 (53.3 t/ha) but was on par with the check variety Co 7219(59.4 t/ha).

Sugar yield (t/ha):

Sugar yield was computed treatment wise and data are presented in table – 1. Sugar yields followed the same trend as that of cane yield.

Summary:

Performance of new promising mid late sugarcane genotypes viz., 2004A104,2007A177 and 2007A16 along with check Co 7219 was studied under graded levels of Nitrogen under irrigated conditions at Regional Agricultural Research Station, Anakapalle during 2014-15 season. The results showed that application of 'N' at 125% recommended dose registered significantly higher cane yield of 60.5 t/ha than lower levels of 75% (54.1 t/ha) and 100% (56.2 t/ha) recommended nitrogen. Among the three new mid late genotypes under test 2004A104 proved superior (59.9 t/ha) to 2007A126 (54.7 t/ha) and 2007A177 (53.3 t/ha) and on par with the check variety Co 7219(59.4 t/ha). Due to heavy rainfall (231.0 mm) received during the month of October due to hud hud cyclone, when crop was in grand growth phase the experimental field was lodged and hence the yields obtained were very low.

Table -1:Yield and quality of promising sugarcane genotypes (mid late group-plant crop) as influenced by different levels of nitrogen under irrigated conditions.

Treatment	Germination (%)	Tiller population/ha at 150DAP	NMC/ha	Cane yield (t/ha)	Juice sucrose (%)	CCS (%)	Sugar yield (t/ha)
Varieties							
2004A104	69.4	1,45,660	64,156	59.9	17.7	12.5	7.5
2007A177	60.8	1,14,439	52,291	53.3	17.6	12.4	6.5
2007A126	77.2	1,46,267	59,317	54.7	17.1	12.2	6.7
Co7219	66.3	1,54,427	63,657	59.4	17.7	12.6	7.5
SEm ±	0.7	738	621	0.88	-	-	-
C.D (0.05)	2.0	2165	1850	2.6	NS	NS	NS
N levels (Rec.dose-112 Kg N/ha)							
N1- 75% RDN	68.4	1,35,938	59,244	54.1	17.4	12.3	6.7
N2-100% RDN	68.7	1,41,991	60,981	56.2	17.1	12.1	6.8
N3-125% RDN	68.2	1,42,664	63,091	60.5	17.8	12.8	7.7
SEm ±	0.6	639	590	0.76	-	-	-
C.D (0.05)	1.8	1875	1710	2.2	NS	NS	NS
Interaction (VxN)							
C.D (0.05)	NS	NS	NS	NS	NS	NS	
C.V %	2.8	2.9	3.1	4.9	5.5	7.2	

I. V. Project No : AS 42

VI. Project Title : Agronomic evaluation of new promising sugarcane genotypes (Early group)-Ratoon under irrigated conditions.

VII. Serial number of the year of experimentation : III year

VIII. Location : Regional Agricultural Research Station, Anakapalle

IX. Objectives : To work out optimum nutrient requirement of sugarcane varieties from advanced varietal trial (Early).

X. Technical programme on which the report is based : Project Coordinator, AICRP on Sugarcane, Agronomy / Soil Science sub-committee. Technical Programme of work for the year 2014-15 finalized during the workshop of AICRP (Sugarcane) held at Andhra University, ANGRAU, Visakhapatnam on 25th and 26th October, 2013.

a. Treatments :

Varieties : Three

V1: 2004 A 55
V2: 2001 A 63
V3: 93 A 145

Nitrogen levels : Three

F1: 75% of the recommended dose of N(84 kg/ha)
F2: 100% of the recommended dose of N(112kg/ha)
F3: 125% of the recommended dose of N(140kg/ha)

b. Design : Factorial RBD

c. Replications : Three

d. Plot size : 9.0 m X 4. 8 m

e. Manuring : As per the treatments

Recommended dose:

224kg N + 100kg P2O5 + 120kg K2O / ha.

Entire dose of phosphorous and potassium was applied as basal at the time of ratooning. Nitrogen was applied in two equal split doses at the time of rationing and 45 DAR.

f. Irrigations : Irrigations were given once in 6 days during formative phase till the onset of monsoon rains and once in 21 days during maturity phase from November till harvest.

g. Date of Ratooning : 17-2-2014

h. Date of harvesting : 13.2.2015

i. Designation and name of the Participants :

1. Dr. V. Gouri, Scientist (Agronomy)
2. Dr.T.Chitkala Devi, Principal Scientist(Agronomy)
3. Dr.K.V.RamanaMurthy, Principal Scientist(Agronomy)
4. Dr. MBGS. Kumari, Scientist (Agronomy)
5. Dr.M.Bharata Lakshmi, Principal Scientist (Sugarcane)i/c

j. Year of trial : III year

k. Results recorded previously : During 2013-14 season application of 125% recommended dose of N registered significantly higher cane yield of 93.1 t/ha as compared to 75% RDN (86.7 t/ha) but found on par with application of 100% recommended nitrogen (89.7 t/ha). New early promising genotypes 2004 A 55 (93.7 t/ha) and 2001 A 63 (91.1 t/ha) registered significantly higher cane yields than the check variety 93 A 145.

l. **Data recorded during the year**:

Initial Soil Analysis:

Initial soil analysis was done. Soil was neutral in pH (7.46), normal in E.C(0.18 dSm^{-1}) low in organic carbon (0.56%), low in available nitrogen (241 kg N /ha), medium in available phosphorus (66.5 kg/ha), high in available potassium (242 kg / K_2O /ha).

Shoot population at 150 DAR:

Shoot population at 150 DAR of different new early sugarcane genotypes varied significantly due to different nitrogen doses. Application of nitrogen fertilizer at 125% recommended dose to early sugarcane genotypes significantly increased the shoot population (90,625/ha) as compared to 75% recommended dose of nitrogen fertilizer (78,935/ha) and 100% recommended dose of nitrogen fertilizer (50,000/ha). Among different new early sugarcane genotypes 2004A55 recorded significantly higher shoot population of 94,965 /ha as compared to 2001A63(87,674/ha) and the check variety 93A145 (83,234/ha) .

Number of millable canes/ha:

Number of millable canes varied significantly due to different nitrogen doses (Table 2). Application of nitrogen fertilizer at 125% recommended dose to early sugarcane genotypes significantly increased the number of millable canes (50,994/ha) as compared to 75% recommended dose of nitrogen fertilizer (48,710/ha) and 100% recommended dose of nitrogen fertilizer (49,504 /ha). Among the genotypes 2004A55 recorded significantly higher number of millable canes (52,456/ha) than 2001 A63 (50,000/ha) and check variety 93A145 (48,156/ha).

Juice Sucrose (%):

Significant differences in juice sucrose (%) was not observed either with genotypes or of nitrogen doses.

Commercial cane sugar per cent:

Commercial cane sugar percent was calculated treatment wise. Commercial cane sugar percent did not varied with the levels of nitrogen fertilizer and also with different early sugarcane genotypes.

Cane yield (t/ha):

Cane yield was recorded at harvest and the data are presented in table-2. Cane yield of early maturing sugarcane genotypes did not varied significantly due to different levels of nitrogen. As the crop completely lodged and subjected to water logging for one month due to **Hud-hud** cyclone occurred during the month of October, 2014 which coincided with maturity stage of the crop, cane yield in different treatmental plots were reduced drastically and significant variations were also not found.

Sugar yield:

Sugar yield was calculated based on CCS% and cane yield. Significant variations were not found in sugar yield both with the levels of nitrogen and genotypes.

Summary:

Performance of new promising early sugarcane genotypes viz., 2004A55 and 2001A63 along with check 93A145 was studied in ratoon under graded levels of Nitrogen under irrigated conditions at Regional Agricultural Research Station, Anakapalle during 2014-15 season. Significant variation in cane yield was not observed both, with genotypes and nitrogen doses as ratoon sugarcane crop was lodged and subjected to water logging for more than one month during huhud cyclone occurred on 12.10.2014. How ever application of 150 % RDN to new promising early sugarcane genotypes (2004A55 and 2001A63) registered higher cane yield of 51.5 t/ha. Both the new genotypes viz. 2004A55 (50.5 t/ha) and 2001A63 (49.3 t/ha) registered higher cane yield than the check variety 93A145 (48.6 t/ha).

Pooled data:

Pooled data mean (two plant crops) of number of millable canes (NMC), juice sucrose %, cane yield and sugar yield was calculated and presented in table-3. Three years studies (two plant crops and one ratoon) on performance of new promising early sugarcane genotypes viz., 2004A55 and 2001A63 along with check 93A145 under graded levels of Nitrogen in irrigated conditions indicated that, among different sugarcane genotypes (early group) 2004A55 recorded higher number of millable canes (91,000/ha) and cane yield (90.5 t/ha). Three tested genotypes performed well and registered higher number of millable canes (89,900/ha), cane yield (91.0 t/ha) and sugar yield (10.5 t/ha) at 125% (140 Kg N/ha) recommended nitrogen. How ever highest mean juice sucrose per cent and sugar yield were recorded at 100%recommended dose of nitrogen dose (table-3).

Table -2: Yield and quality of promising early maturing sugarcane genotypes as influenced by different levels of nitrogen in ratoon under irrigated conditions during 2014-15.

Treatment	Shoot population at 150 DAR	NMC/ha	*Cane yield (t/ha)	Juice sucrose (%)	CCS (%)	Sugar yield (t/ha)
Varieties						
2004A55	94,965	52,456	50.5	17.0	11.5	5.9
2001A63	87,674	50,000	49.3	16.7	11.2	5.8
93A145	83,234	48,156	48.6	16.8	11.3	5.7
SEm ±	494	285	-	-	-	-
C.D (0.05)	1447	835	NS	NS	NS	NS
N levels (Rec.dose-224 Kg N/ha for ratoon)						
75% RDN	78,935	48,710	48.0	16.7	11.4	5.7
100% RDN	85,532	49,504	48.5	16.7	11.2	5.6
125% RDN	90,625	50,994	49.6	17.0	11.2	5.9
SEm ±	570	329	-	-	-	-
C.D (0.05)	1671	964	NS	NS	NS	NS
Interaction (VxN)						
C.D (0.05)	NS	NS	NS	NS	NS	NS

*Ratoon crop was subjected to water logging for one month due to hudhud cyclone occurred on 12.10.2014 hence yields are very low

Table 3 : Pooled data of number of millable canes, juice sucrose %, cane yield and sugar yield of new early promising sugarcane genotypes as influenced by different levels of nitrogen under irrigated conditions (2012-13 to 2014-15).

Treatments	Number of millable Canes (000/ha)			Mean of two plant crops	Juice sucrose %			Mean of two plant crops	Cane yield(t/ha)			Mean of two plant crops	Sugar yield (t/ha)			Mean of two plant crops
	2012-13 (plant)	2013-14 (plant)	2014-15 Ratoon		2012-13	2013-14	2014-15 Ratoon		2012-13	2013-14	2014-15 Ratoon		2012-13	2013-14	2014-15 Ratoon	
Varieties																
V1-2004A55	79.3	102.6	52,456	91.0	14.85	16.2	17.0	15.53	87.3	93.7	50.5	90.5	9.53	12.4	5.9	11.0
V2-2001A63	82.5	98.0	50,000	90.3	15.53	16.1	16.7	15.82	88.0	91.1	49.3	89.6	9.87	11.9	5.8	10.9
V3-93A145	78.9	95.9	48,156	87.4	16.06	16.4	16.8	16.23	82.9	88.6	48.6	85.8	9.58	12.1	5.7	11.04
S.Em±	0.99	0.713	285		0.33	-	-		1.09	1.24	-			-	-	
C.D. (P = 0.05)	2.93	2.092	835		0.95	NS	NS		3.22	3.7	NS			NS	NS	
Nitrogen Levels																
N1:75% of RDN (84 kg N/ha)	75.44	92.6	78,935	84.02	15.42	16.2	16.7	15.81	78.5	86.7	48.0	82.6	8.57	11.4	5.7	10.0
N2:100% of RDN (112 kg N/ha)	78.54	99.07	85,532	88.81	15.53	16.4	16.7	16.0	87.8	89.7	48.5	88.8	9.79	12.4	5.6	11.1
N3:125% of RDN (140 kg N/ha)	81.57	98.15	90,625	89.9	15.14	16.3	17.0	15.7	88.9	93.1	49.6	91.0	9.94	12.1	5.9	11.02
S.Em±	1153	824	570			-	-		1.27	1.44	-			-	-	
C.D. (P = 0.05)	3384	2416	1671		NS	NS	NS		3.72	4.2	NS					
Interaction(VXN)	NS	NS	NS		NS	NS	NS		NS	NS	NS					

III. V. Project No : AS 64

VI. Project Title : Response of sugarcane to different plant nutrients in varied agro ecological situations.

VII. Serial number of the year of experimentation : IV year

VIII. Location : Regional Agricultural Research Station, Anakapalle

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

X. Technical programme on which the report is based : Project Coordinator, AICRP on Sugarcane, Agronomy / Soil Science sub-committee. Technical Programme of work for the year 2014-15 finalized during the workshop of AICRP (Sugarcane) held at Andhra University, ANGRAU, Visakhapatnam on 25th and 26th October, 2013.

a. Treatments :13

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 @ 20 t/ha

S:60 kg/ha- elemental sulphur
Zn: 50 kg $ZnSO_4$/ha
Fe: 1% foliar spray thrice at weekly intervel during vegetative stage.
Mn: 10 kg $MnSO_4$/ha
NPK as per recommendation (112kg N + 100kg P2O5 + 120kg K2O / ha)

b. Design : RBD

c. Replications : Three

d. Plot size : 7.0mX 5.6m

e. Manuring : As per treatments. Entire dose of phosphorous & potassium, was applied as basal in furrows. Nitrogen was applied in two equal split doses at 45 and 90 days after planting.

f. Irrigations : Once in 6 days during formative phase lies in the onset of monsoon rains and once in 21 days during maturity phase from November till harvest.

g. Date of planting 3.3.2014

h.Date of harvesting : 6.2.2015

i. Designation and name of the Participants : 1.Dr. V. Gouri, Scientist (Agronomy)
2..Dr.T.Chitkala Devi, Principal Scientist(Agronomy)
3.Dr.K.V.Ramana Murthy, Principal Scientist(Agronomy)
4.Dr. MBGS. Kumari, Scientist (Agronomy)
5.Dr. M.Bharata Laksmi, Principal Scientist (Sugarcane)i/c

j. Year of trial : IV year

k. Results recorded previously : During 2013-14 season Application of N,P and K along with micronutrients on soil test basis registered

significantly higher cane yield (91.6 t/ha) as compared to application of N alone (80.7 t/ha) or N and P (82.0 t/ha) or application of FYM @ 20 t/ha (73.3 t/ha), but found on par with application of N, P, K + S + Zn + Fe +Mn (91.0 t/ha) or NPK +S+Zn (90.7 t/ha) or N,P,K + Fe (90.5 t/ha) or N, P, K + S + Zn + Fe (90.3 t/ha) or NPK + Mn (89.7 t/ha) or NPK + Zn (89.1 t/ha) or N, P, K + S (87.5 t/ha) or N,P and K (87.2 t/ha). No fertilizer applied plot registered significantly lower cane yield of 55.0 t/ha.

l. Data recorded during the year:

Initial soil analysis:

Initial soil analysis was done. The soil was low in organic carbon (0.43%), low in available nitrogen (206 kg N /ha), medium in available phosphorus (39.0 kg/ha), high in available potassium (325 kg / K_2O /ha), optimum in Sulphur , low in Zinc (0.44 ppm), low in Iron (2.7 ppm) and sufficient in Manganese (2.5 ppm).

Germination:

Germination was recorded at 35th day after planting expressed in % and presented in table-4. Application of nitrogen, phosphorus and potassium along with other micronutrients Zn, S, Mn and Fe or soil test based fertilizer application registered higher per cent germination (88.7 and 87.6 respectively). Control plot (no fertilizer) registered lesser germination per cent of 76.1 per cent.

Plant height at 120 DAP:

Plant height in cm was recorded at 120 day after planting and presented in table-4. Significantly higher plant height was recorded in application of N,P and K along with micronutrients on soil test basis (168.3 cm) as compared to control plot (126.2 cm) but found on par with all other treatments.

Tiller population at 120 DAP/ha:

Number of tillers at 120 days after planting was recorded and data are presented in table 4. Application of N,P and K along with micronutrients on soil test basis (1,57,440/ha) and application of N, P, K + S + Zn + Fe+ Mn (1,57,143/ha) recorded significantly higher number of tillers. Control plot recorded significantly less number of tillers (1,32,142/ha) at 120 DAP.

Number of millable canes/ha:

Number of millable canes was recorded at harvest and data are presented in table -4. Application of N,P and K along with micronutrients on soil test basis recorded significantly higher number of millable canes (85,277/ha) and it was on par with application of N P K + S + Zn + Fe + Mn (84,722/ha) than other nutrient treatments. No fertilizer applied plot recorded significantly lower number of millable canes (69,444/ha) at harvest .

Cane yield (t/ha):

Cane yield was recorded at harvest and the data are presented in table-4. Application of nutrients as per soil test basis registered significantly higher cane yield of 79.9 t/ha as compared to application of N alone (68.5 t/ha) or N and P (70.0 t/ha) or N, P and K (72.8 t/ha) or NPK+S (73.6 t/ha) but found on par with application of macro nutrients (N,P,K) along with Fe, Zn and also Mn and S (78.3 t/ha) or NPK +S+Zn and Fe (76.1 t/ha) or NPK +S+Zn (75.5 t/ha) or NPK + Fe (75.9 t/ha) or NPK + Zn (75.0 t/ha) or NPK + Mn (74.0 t/ha). No fertilizer applied plot registered the lowest cane yield of 55.5 t/ha.

Juice Sucrose (%):

Cane juices were analysed for sucrose content at harvest (Table – 4). Juice sucrose values did not vary significantly due to different nutrient treatments.

Commercial cane sugar:

CCS % varied significantly due to different nutrient treatments. Application of N,P and K along with micronutrients Fe,Zn &Mn and also S recorded significantly higher CCS% (14.4) as compared to other nutrient combinations.

Sugar yield (t/ha):

Sugar yield was calculated based on CCS% and cane yield. Sugar yield ranged from 8.9 to 11.2 t/ha in different nutrient applied plots. No fertilizer applied plot registered the lowest sugar yield of 7.2 t/ha.

Summary:

Effect of different macro and micro nutrients along with sulphur was studied during 2014-15 season at RARS, Anakapalle. The results of the study indicated that, application of nutrients as per soil test basis registered significantly higher cane yield of 79.9 t/ha as compared to application of N alone (68.5 t/ha) or N and P (70.0 t/ha) or N, P and K (72.8 t/ha) or NPK+S (73.6 t/ha) but found on par with application of macro nutrients (N,P,K) along with Fe, Zn and also Mn and S (78.3 t/ha) or NPK +S+Zn and Fe (76.1 t/ha) or NPK +S+Zn (75.5 t/ha) or NPK + Fe (75.9 t/ha) or NPK + Zn (75.0 t/ha) or NPK + Mn (74.0 t/ha). No fertilizer applied plot registered the lowest cane yield of 55.5 t/ha.

Pooled data:

Pooled data mean (Three plant crops) of number of miilable canes (NMC), juice sucrose %, cane yield and sugar yield was calculated and presented in table- 5 . Three years studies on effect of different macro and micro nutrients along with sulphur revealed that, application of different nutrients as per soil test basis and application of macro nutrients (N,P,K) along with Fe, Zn and also Mn and S registered higher number of mllable canes, cane yield and sugar yield as compared to other nutrient treatments (Table-5). No fertilizer applied plot registered the lowest number of millable canes (62,900/ha), cane yield (53.9 t/ha) and sugar yield (7.01 t/ha).

Application of N alone(T2 treatment) registered 34.8 per cent higher cane yield as compared to control plot i.e no fertilizer applied plot (T1 treatment). Application of N and P (T2 treatment) & N,P and K(T3 treatment) increased the cane yield to the extent of 3.9 % & 4.4% respectively as compared to application of N alone. These results indicating that among three macro nutrients nitrogen play key role n increasing the cane yield than phosphorus and potassium nutrients, further increase in cane yield is higher due to application of potassium rather than phosphorous.

There was 5.5 t/ha increase in cane yield when all macro and micronutrients applied (T11 treatment) as compared to application of only macronutrients (T4 treatment) indicating 7 per cent increase in cane yield due to application of micronutrients viz., Fe, Zn & Mn and also Sulphour. Among different micronutrients, response of sugarcane crop to Fe and Zn found to be more when compared to Mn and sulphour (table-5).

Application of only FYM @ 20 t/ha increased the cane yield to an extent of 26.3 per cent as compared to control treatment i.e no fertilizer applied treatment.

Table:4 - Yield attributes, Yield and quality of sugarcane as influenced by different nutrients during 2014-15.

Treatments	Germination (%)	Plant height (cm) at 120 DAP	Tiller populatio/ ha n at 120 DAP	NMC/ha	Cane yield (t/ha)	Sucrose (%)	CCS (%)	Sugar Yield (t/ha)
T1: Control (No Fertilizer)	76.7	126.2	1,32,142	69,444	55.5	18.5	13.0	7.2
T2: N	80.7	146.0	1,36,607	72,222	68.5	19.3	13.7	9.3
T3: NP	84.1	142.7	1,45,238	75,833	70.0	19.5	14.0	9.8
T4: NPK	85.6	151.0	1,49,107	77,778	72.8	19.4	13.7	8.6
T5: NPK +S	81.6	131.8	1,50,298	78,611	73.6	19.7	13.9	10.2
T6: NPK + Zn	83.2	165.3	1,53,274	80,278	75.0	19.0	14.3	10.7
T7: NPK + Fe	84.9	165.0	1,56,548	80,833	75.9	19.1	13.4	10.1
T8: NPK +Mn	84.4	156.8	1,55,357	79,722	74.0	19.1	14.5	10.7
T9: NPK + S + Zn	84.9	160.5	1,56,250	80,555	75.5	19.2	13.8	10.4
T10: NPK + S + Zn +Fe	86.9	161.2	1,56,250	81,111	76.1	19.9	13.9	10.5
T11: NPK + S + Zn +Fe + Mn	88.6	161.7	1,57,143	84,722	78.3	19.2	14.4	11.2
***T12: Soil test based fertilizer application**	87.8	168.3	1,57,440	85,277	79.9	18.3	13.0	10.4
T13: FYM @ 20 t/ha	77.1	141.2	1,41,667	70,278	66.9	18.7	13.4	8.9
S.Em±	-	9.4	2507	961.4	1.7	-	0.44	-
C.D. (P=0.05)	NS	27.4	7317	2806.0	5.0	NS	1.3	NS
C.V (%)	10.7	10.69	2.9	2.13	4.1		5.6	

*T12- FYM- 20 t/ha: N-145 Kg /ha: P_2O_5-100 Kg/ha: K_2O-84 Kg/ha :elemental sulphur- 60 Kg/ha: $ZnSO_4$- 50 Kg/ha :$FeSO_4$-1% spray thrice at weekly interval during vegetative phase

Table:5 - Yield attributes, Yield and quality of sugarcane as influenced by application of different nutrients pooled over 3 years from 2012-13 to 2014-15.

Treatments	Number of millable Canes (000/ha)				Juice sucrose (%)				Cane yield (t/ha)				Sugar Yield (t/ha)			
	2012-13	2013-14	2014-15	Mean	2012-13	2013-14	2014-15	Mean	2012-13	2013-14	2013-14	Mean	2012-13	2013-14	2014-15	Mean
T1: Control (No Fertilizer)	57.3	62.1	69.4	62.9	17.6	16.9	18.5	17.66	51.3	55.0	55.5	53.9	6.50	7.5	7.2	7.01
T2: N	68.9	65.12	72.2	68.7	17.6	16.5	19.3	17.80	69.0	80.7	68.5	72.7	8.83	11.0	9.3	9.71
T3: NP	70.6	79.2	75.8	75.2	16.8	18.0	19.5	18.10	74.4	82.0	70.0	75.5	8.93	11.6	9.8	10.11
T4: NPK	72.1	82.1	77.8	77.3	17.9	16.9	19.4	18.06	76.3	87.2	72.8	78.8	10.10	11.9	8.6	10.2
T5: NPK +S	74.5	82.8	78.6	78.6	18.3	15.8	19.7	17.90	78.2	87.5	73.6	79.8	10.40	10.6	10.2	10.4
T6: NPK + Zn	76.3	85.0	80.3	80.5	17.4	16.4	19.0	17.60	80.5	89.1	75.0	81.5	10.22	12.7	10.7	11.21
T7: NPK + Fe	77.6	86.2	80.8	81.5	17.3	16.1	19.1	17.50	81.1	90.5	75.9	82.5	10.10	11.9	10.1	10.7
T8: NPK +Mn	75.6	85.1	79.7	81.2	16.6	17.3	19.1	17.66	79.8	89.7	74.0	81.2	9.70	12.6	10.7	11.0
T9: NPK + S + Zn	76.0	87.0	80.6	81.2	16.6	17.6	19.2	17.80	80.1	90.7	75.5	82.1	9.61	12.7	10.4	10.9
T10: NPK + S + Zn +Fe	78.5	86.01	81.1	81.9	17.2	17.5	19.9	18.20	81.4	90.3	76.1	82.6	10.20	13.1	10.5	11.3
T11: NPK + S + Zn +Fe + Mn	80.8	88.9	84.7	84.8	17.3	17.5	19.2	18.00	83.6	91.0	78.3	84.3	10.50	12.0	11.2	11.2
***T12: Soil test based fertilizer application**	79.8	89.9	85.3	85.0	17.6	17.1	18.3	17.66	82.9	91.6	79.9	84.8	11.8	13.5	10.4	11.9
T13: FYM @ 20 t/ha	59.3	71.81	70.3	67.1	17.6	16.4	18.7	17.60	64.0	73.3	66.9	68.1	8.5	10.0	8.9	9.1
S.Em+	0.78	0.480	0.96		0.24	-	-		1.53	1.69	1.7		-		-	
C.D. (P=0.05)	2.3	1.400	2.806		0.71	NS	NS		4.46	4.92	5.0		-		NS	

I. V. Project No : AS 66

VI. Project Title : Priming of cane node for accelerating germination in sugarcane.

VII. Serial number of the year of experimentation : III year

VIII. Location : Regional Agricultural Research Station, Anakapalle

IX. Objectives :
1. To find out suitable cane node priming technique.
2. To assess the effect of cane node on acceleration of germination.

X. Technical programme on which the report is based : Project Coordinator, AICRP on Sugarcane, Agronomy / Soil Science sub-committee. Technical Programme of work for the year 2014-15 finalized during the workshop of AICRP (Sugarcane) held at Andhra University, ANGRAU, Visakhapatnam on 25th and 26th October, 2013.

a. Treatments :

T1: Un-primed cane node

T2: Treating cane node in hot water at 50^0C for 2 hours.

T3: Treating cane node in hot water (50^0 C) + 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 cane node (incubated for four days after priming)

(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.)

b. Design : RBD

c. Replications : Four

d. Plot size : 6.0 m X 6.4 m

e. Manuring : 112kg N + 100kg P2O5 + 120kg K2O / ha.
Entire dose of phosphorus and potassium was applied as basal in furrows. Nitrogen was applied in two equal split doses at 45 and 90 days after planting.

f. Irrigations : Irrigations were given once in 6 days during formative phase till the onset of monsoon rains and once in 21 days during maturity phase from November till

g. Date of planting : 25.1.2015

h.Date of harvesting : 19.1.2015

i. Designation and name of the Participants :
1. Dr. V. Gouri, Scientist (Agronomy)
2. Dr.T.Chitkala Devi, Principal Scientist(Agronomy)
3. Dr. MBGS. Kumari, Scientist (Agronomy)
4. Dr.K.V.Ramana Murthy, Principal Scientist(Agronomy)
5. Dr.M.Bharata Lakshmi, Principal Scientist (Sugarcane)i/c

j. Year of trial : III year

k. Results recorded previously : During 2013-14 season among the priming treatments, priming cane nodes with cattle dung, cattle urine and water in 1:2:5 ratio registered significantly higher cane yield of 79.5 t/ha followed by treating

cane node in hot water of 50^0C+urea solution (3%) for 2 hours (78.7 t/ha)). Planting of unprimed cane nodes registered lowest cane yield of 73.4 t/ha. Conventional three bud sett planting registered higher cane yield of 84.6 t/ha.

l. Data recorded during the year:

Germination:

Germination was recorded at 30 and 40 days after planting expressed in % and presented in table-6. At 40 DAP, conventional 3 bud sett planting recorded significantly higher per cent germination(89.8). Among different priming cane node treatments, priming cane node with cattle dung, urine and water in 1:2:5 ratio recorded highest germination percent (81.9). Significantly lowest per cent germination was registered in un primed cane node plot (67.2).

Number of millable canes/ha:

Significant differences were observed in number of millable canes due to different priming cane node treatments. Conventional 3 bud sett planting recorded significantly higher number of millable canes (72,587/ha). Among different primng treatments, priming cane node with cattle dung, urine and water in 1:2:5 ratio registered significantly higher number of millable canes of 70,214/ha but found on par with planting of cane nodes treated with hot water at 50^OC+ 3 % urea solution(69,620/ha).

Juice sucrose (%):

Cane juices were analysed for sucrose content at harvest (Table-6). Per cent juice sucrose values did not vary significantly due to different priming cane node treatments. How ever, the per cent juice sucrose values in different treatments varied between 16.0 to 17.4.

Commercial cane sugar (%):

Commercial cane sugar was calculated treatment wise and presented in table-6. CCS% did not vary significantly due to different treatments. However slightly higher CCS% was recorded in conventional 3 bud sett planting (Table-6).

Cane yield (t/ha):

Cane yield was recorded at harvest and presented in Table -6. Conventional 3 bud sett planting recorded significantly higher cane yield (80.1 t/ha) than with primed cane nodes planting. Cane yields recorded in all priming cane node treatments along with control i.e un primed cane node treatment plots were on par with each other and no significant variations were observed un like other two years experimental results which might be due to crop lodging during the month of October due to Hud hud cyclone. However, highest cane yield among different cane node treatments was recorded in priming cane node with cattle dung, urine and water in 1:2:5 ratio (77.6 t/ha) and the lowest cane yield of 75.0 t/ha was registered in un-primed cane node treatment .

Sugar yield:

Sugar yield was computed treatment wise. Sugar yield ranged from 8.8 to 10.0 t/ha.

Summary:

Studies conducted on priming of cane nodes in different methods for accelerating the germination in sugarcane was studied at Regional Agricultural Research Station, Anakapalle during 2013-14 season. The results indicated that conventional 3 bud sett planting recorded significantly higher number of millable canes (72,587 /ha) and cane yield (80.1 t/ha). Among different priming cane node treatments priming cane node with cattle dung, urine and water in 1:2:5 ratio performed better and registered higher cane yield of 77.6 t/ha and found on par with conventional 3 bud sett planting and also it was on par with the other priming cane node treatments.

Pooled data:

Pooled data mean (Three plant crops) of number of miilable canes (NMC), juice sucrose %, cane yield and sugar yield was calculated and presented in table-7. Three years studies on priming of cane nodes in different methods for accelerating the germination in sugarcane at RARS, Anakapalle indicated that different priming treatments could not increase either germination per cent or cane yield as compared to conventional three bud sett planting(Table- 7) except priming cane node with cattle dung, urine and water in 1:2:5 ratio which performed better and registered higher mean germination per cent (78.5), number of millable canes (71,800/ha), cane yield (76.9 t/ha) than other priming cane node treatments. Conventional three bud sett planting was found superior over all other treatments in germination per cent(83.3), number of millable canes (74,600/ha), cane yield (80.0 t/ha). Quality parameters did not vary due to different priming cane node treatments.

Table-6 : Yield attributes, yield and quality of sugarcane as influenced by priming of cane node during 2014-15.

Treatment	Germination % at 30DAS	Germination % at 40DAS	LMC (cm)	NMC /ha	Cane yield (t/ha)	Juice sucrose (%)	CCS (%)	Sugar yield (t/ha)
T1:Un-primed cane node	64.1	67.2	268.5	68,433	75.0	16.7	12.1	9.0
T2: Treating cane node in hot water in 50^0C for 2 hours.	68.4	76.8	270.5	69,225	76.0	16.8	12.2	9.2
T3: Treating cane node in hot water (50^0 C) + urea solution (3%) for 2 hours.	59.0	78.8	268.0	69,620	76.5	16.0	11.6	8.8
T4: Priming cane node with cattle dung, cattle urine and water in 1:2:5 ratio.	66.0	81.9	288.5	70,214	77.6	16.9	12.2	9.5
T5: Conventional 3 bud settplanting.	78.5	89.8	266.0	72,587	80.1	17.4	12.6	10.0
T6: Primed and sprouted cane node (incubated for four days after priming)	51.2	75.8	247.5	68,235	75.9	16.5	12.0	9.1
SEm±	2.7	1.5	5.0	603.0	1.2		-	-
C.D (0.05)	8.2	4.5	15.0	1817.0	3.5	NS	NS	NS
C.V%	8.5	3.8	3.9	2.0	5.5			

Table 7 - Yield attributes, yield and quality of sugarcane as influenced by priming of cane node treatments (pooled over 3 years from 2012-13 to 2014-15)

Treatments	Germination % at 40 DAP				Number of millable Canes (000/ha)				Juice sucrose %				Cane yield(t/ha)				Sugar yield (t/ha)			
	2012-13	2013-14	2014-15	Mean	2012-13	2013-14	2014-15	Mean	2012-13	2013-14	2014-15	Mean	2012-13	2013-14	2014-15	Mean	2012-13	2013-14	2014-15	Mean
T1:Un-primed cane node	55.4	58.8	67.2	60.5	58.4	74.0	68.4	66.9	16.5	18.8	16.7	17.3	63.3	73.4	75.0	70.6	8.2	10.7	9.0	9.3
T2: Treating cane node in hot water in 50^0C for 2 hours.	62.7	75.8	76.8	71.8	60.0	76.2	69.2	68.5	16.5	17.7	16.8	17.0	66.0	75.3	76.0	72.4	7.9	10.6	9.2	9.23
T3: Treating cane node in hot water (50^0 C) + urea solution (3%) for 2 hours	67.8	80.9	78.8	75.8	62.8	77.2	69.6	69.9	17.1	18.6	16.0	17.2	69.1	78.7	76.5	74.8	8.4	11.5	8.8	9.6
T4: Priming cane node with cattle dung, cattle urine and water in 1:2:5 ratio	71.7	82.0	81.9	78.5	65.6	79.5	70.2	71.8	17.8	18.3	16.9	17.7	73.5	79.5	77.6	76.9	9.6	11.2	9.5	10.1
T5: Conventional 3 bud settplanting.	74.2	85.9	89.8	83.3	67.2	84.1	72.6	74.6	17.7	18.4	17.4	17.8	75.3	84.6	80.1	80.0	10.5	11.4	10.0	10.6
T6: Primed and sprouted cane node (incubated for four days after priming)	56.4	60.3	75.8	64.2	58.8	74.7	68.2	67.2	16.3	17.7	16.5	16.8	64.4	74.6	75.9	71.6	7.7	10.3	9.1	9.0
SEm±	2.17	1.09	1.5		1.913	1.742	0.6		-	-			0.78	1.8	1.2		-	-	-	
C.D (0.05)	6.56	3.3	4.5		5.769	5.249	1.8		NS	NS	NS		2.35	5.3	3.5		-	NS	NS	
C.V(%)		2.9	3.8			4.5	2.0			5.5				4.8	5.5			6.3		

I. V. Project No : AS 68

VI. Project Title : Impact of integrated application of organics and in-organics in improving soil health and sugarcane productivity

VII. Serial number of the year of experimentation : I year

VIII. Location : Regional Agricultural Research Station, Anakapalle

IX. Objectives : To develop nutrient management strategy for sustaining soil health and sugarcane production

X. Technical programme on which the report is based : Project Coordinator, AICRP on Sugarcane, Agronomy / Soil Science sub-committee. Technical Programme of work for the year 2014-15 finalized during the workshop of AICRP (Sugarcane) held at Andhra University, ANGRAU, Visakhapatnam on 25th and 26th October, 2013. .

a. Treatments :

	Sugarcane (Plant crop)	Ratoon - I	Ratoon - II
T1	No organic + 50% RDF	Application of trash at 10 tonnes /ha + 50% RDF	Application of trash at 10 tonnes /ha + 50% RDF
T2	No organic + 100% RDF	Application of trash at 10 tonnes /ha + 100% RDF	Application of trash at 10 tonnes /ha + 100% RDF
T3	No organic + Soil test based recommendation.	Application of trash at 10 tonnes /ha + soil test basis (NPK application).	Application of trash at 10 tonnes /ha + soil test basis (NPK application).
T4	Application of FYM/Compost @ 20 tonnes/ha + 50% RDF (inorganic source).	Application of FYM / Compost @ 20 tonnes / ha + 50% RDF (inorganic source).	Application of FYM / ompost @ 20 tonnes / ha + 50% RDF (inorganic source).
T5	Application of FYM / Compost @ 20 tonnes/ha + 100% RDF (inorganic source).	Application of FYM / Compost @ 20 tonnes / ha + 100% RDF (inorganic source).	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)	Application of FYM / Compost @ 20 tonnes / ha + in organic nutrient application based on soil test (NPK application).	Application of FYM / Compost @ 20 tonnes / ha + in organic nutrient application based on soil test (NPK application).
T7	Application of FYM/Compost @ 10 tonnes/ha + Biofertilizer (Azotobactor / Acetobactor + PSB) + 50% RDF	Application of FYM / Compost @ 10 tonnes / ha + bio-fertilizer (*Azotobacter / Acetobacter + PSB*) + 50% RDF.	Application of FYM / Compost @ 10 tonnes / ha + bio-fertilizer (*Azotobacterr / Acetobacter + PSB*) + 50% RDF.
T8	Application of	Application of FYM /	Application of FYM /

	FYM/Compost @ 10 tonnes/ha + Biofertilizer (Azotobactor / Acetobactor + PSB) + 100%RDF	Compost @ 10 tonnes / ha + bio-fertilizer (*Azotobacter / Acetobacter* + *PSB*) + 100% RDF.	Compost @ 10 tonnes / ha + bio-fertilizer (*Azotobacter / Acetobacter* + *PSB*) + 100% RDF.
T9	Application of FYM/Compost @ 10 tonnes/ha + Biofertilizer (Azotobactor /Acetobactor + PSB) + Soil test basis	Application of FYM / Compost @ 10 tonnes / ha + bio-fertilizer (*Azotobacter / Acetobacter* + *PSB*) + soil test basis (NPK application).	Application of FYM / Compost @ 10 tonnes / ha + bio-fertilizer (*Azotobacter / Acetobacter* + *PSB*) + soil test basis (NPK application).

b. Design : RBD
c. Replications : Three
d. Plot size : 6.4 m X 4.8m (6 rows)
e. Manuring : As per Treatments.

f. Irrigations : Irrigations were given once in 6 days during formative phase till the onset of monsoon rains and once in 21 days during maturity phase from November till harvest.

g. Date of planting : 14.4.2014
h.Date of harvesting : 7.3.2014

i. Designation and name of the Participants :

1. Dr. V. Gouri, Scientist (Agronomy)
2.Dr.T.Chitkala Devi, Principal Scientist (Agronomy)
3.Dr.M.Bharata Lakshmi, Principal Scientist (Sugarcane)i/c
4.Dr. N. Raj Kumar, Scientist (Plant Pathology)
5.Dr.K.V.Ramana Murthy, Principal Scientist (Agronomy)
6. Dr.MBGS.Kumari, Scientist (Agronomy)

j. Year of trial : I year
k. Results recorded previously : New trial

l. Data recorded during the year:

Initial soil analysis:

Initial soil analysis was done. Soil was neutral in pH (7.57), normal in E.C (0.356 dSm^{-1}), low in organic carbon (0.50%), low in available nitrogen (201 kg N /ha) and high in available potassium (360 kg K_2O /ha).

Germination per cent:

Germination was recorded at 45 days after planting and expressed in % and presented in table-8. At 45 DAP, Application of FYM @ 10 tonnes/ha + Biofertilizer (Azotobactor + PSB) + inorganic nutrient application based on Soil test basis recorded significantly higher germination per cent as compared to no organic treatmental plots (T1,T2 and T3) but found on par with other treatments (T5,T6,T8 and T7) Significantly lowest per cent germination was registered in No organic + 100% RDF treat ment.

Tiller population at 150 DAP:

Number of tillers at 150 days after planting was recorded and data are presented in table - 8 . Application of FYM @ 10 tonnes/ha + Biofertilizer (Azotobactor + PSB) + inorganic nutrient application based on Soil test basis recorded significantly higher germination per cent as compared to no organic treatmental plots (T1,T2 and T3) but found on par with other treatments (T5,T6,T8 and T7).

Number of millable canes/ha:

Significant differences were not observed in number of millable canes due to different organic and inorganic treatments. How ever Application of FYM @ 10 tonnes/ha + Biofertilizer (Azotobactor + PSB) + inorganic nutrient application based on Soil test basis recorded higher number of millable canes (67,285/ha) at harvest.

Length of Millable Cane (LMC cm):

Length of the millable cane was measured at harvest in cm and data are presented in Table-8 .Significantly longest canes were registered in application of FYM @ 10 tonnes/ha + Biofertilizer (Azotobactor + PSB) + inorganic nutrient application based on Soil test basis treatment (266.2 cm) but found on par with all other treatments except application of no organics + 50% RDF(240.7 cm).

Juice sucrose (%):

Cane juices were analysed for sucrose content at harvest (Table-8). Per cent juice sucrose values did not vary significantly due to different organic and inorganic treatments. How ever, the per cent juice sucrose values in different treatments varied between 16.6 to 17.7.

Commercial cane sugar (%):

Commercial cane sugar was calculated treatment wise and presented in table-8. CCS% did not vary significantly due to different treatments.

Cane yield (t/ha):

Cane yield was recorded at harvest and presented in Table -8 . Application of FYM @ 10 tonnes/ha + Biofertilizer+inorganic nutrient application based on soil test basis registered significantly higher cane yield of 67.4 t/ha as compared to application of 50 % RDF+FYM@20 t/ha(60.0 t/ha) or 50%RDF+FYM@20t/ha+Biofertilizer (61.7 t/ha) or 100% RDF or application of fertilizers based on soil test (62.8 t/ha). Application of FYM @ 10 tonnes/ha+ Biofertilizer+ 100%RDF (66.7 t/ha) or FYM@20 tonnes/ha + inorganic nutrient application based on soil test (64.0 t/ha) or FYM @ 20 tonnes/ha + 100% RDF (63.5 t/ha) recorded more or less similar cane yields.s Application of only 50% RDF registered lowest cane yield of 58.2 t/ha.

Sugar yield:

Sugar yield was computed treatment wise. Sugar yield ranged from 6.8 to 8.1 t/ha.

Summary:

Studies on impact of integrated application of organics and in-organics in improving soil health and sugarcane productivity was studied at Regional Agricultural Research Station, Anakapalle during 2014-15 season. The results indicated that application of FYM @ 10 tonnes/ha + Biofertilizer+inorganic nutrient application based on soil test basis registered significantly higher cane yield of 67.4 t/ha as compared to application of 50 % RDF+FYM@20 t/ha(60.0 t/ha) or 50%RDF+FYM@20t/ha+Biofertilizer (61.7 t/ha) or 100% RDF or application of fertilizers based on soil test (62.8 t/ha) or application of inorganic nutrient based on Soil test but found on par with the application of FYM @ 10 tonnes/ha+ Biofertilizer+ 100%RDF (66.7 t/ha) or FYM@20 tonnes/ha + inorganic nutrient application based on soil test (64.0 t/ha) or FYM @ 20 tonnes/ha + 100% RDF (63.5 t/ha). Application of only 50% RDF registered lowest cane yield of 58.2 t/ha. Cane yields recorded were low during 2014-15 season due to lodging and water logging on account of heavy rain fall and high speed gales during hudhud cyclone

Table -8: Yield attributes, yield and quality of sugarcane as influenced by application of organic and inorganic plant nutrients during 2014-15

Treatment	Germination % at 45 DAS	Tiller population at 150 DAP	NMC/ha	LMC (cm)	Cane yield (t/ha)	Juice sucrose (%)	CCS (%)	Sugar yield (t/ha)
T1-No organic + 50% RDF	66.3	88,542	60,775	240.7	58.2	17.2ss	11.7	6.8
T2-No organic + 100% RDF	61.0	90,169	61,300	249.9	62.8	17.7	12.1	7.1
T3-No organic + Soil test based recommendation.	64.1	89,518	59,382	251.2	63.0	16.6	11.3	7.0
T4-Application of FYM/Compost @ 20 tonnes/ha + 50% RDF (inorganic source).	71.8	1,06,120	63,477	254.7	60.0	17.0	11.5	6.9
T5-Application of FYM / Compost @ 20 tonnes/ha + 100% RDF (inorganic source).	76.6	1,21,093	64,453	256.7	63.5	17.2	11.7	7.1
T6-Application of FYM/Compost @ 20 tonnes/ha + inorganic nutrient application based on soil test(rating chart)	76.6	1,18,489	64,778	257.8	64.0	17.6	11.7	7.2
T7-Application of FYM/Compost @ 10 tonnes/ha + Biofertilizer (Azotobactor / Acetobactor + PSB) + 50% RDF	75.9	1,13,281	63,477	257.3	61.7	17.1	11.9	7.4
T8-Application of FYM/Compost @ 10 tonnes/ha + Biofertilizer (Azotobactor / Acetobactor + PSB) + 100%RDF	74.7	1,12,955	66,732	261.3	66.7	17.0	11.5	7.7
T9-Application of FYM/Compost @ 10 tonnes/ha + Biofertilizer (Azotobactor /Acetobactor + PSB) + inorganic nutrient application based on Soil test basis	77.4	1,26,628	67,285	266.2	67.4	17.5	12.0	8.1
SEm±	3.13	5912	4512	8.0	1.4	-	-	-
C.D (0.05)	9.4	17,722	NS	24.0	4.1	NS	NS	NS
C.V(%)	7.6	9.6	5.4	12.3	3.4			