

AICRP(Sugarcane)

**Annual report for the year
2016-17**

**CROP PRODUCTION
Regional Agricultural Research Station,
Anakapalle**

Rainfall, Mean Temperatures and RH during crop growth period of 2016-17 at Regional Agricultural Research Station, Anakapalle.

Month & Year	Rainfall (mm)	No. of Rainy Days	Temperature (°C)		R.H%		B.S.S.H	Evaporation (mm)
			Max.	Min.	F.N	A.N		
January, 2016	0	0	30.50	20.92	91	48	0.7	6.2
February, 2016	0	0	33.16	23.08	91	47	1.9	7.2
March, 2016	0	0	35.11	23.84	90	48	2.3	7.5
April, 2016	0	0	36.41	27.58	84	51	3.1	8.2
May, 2016	209.2	6	35.83	28.01	82	57	2.4	7.3
June, 2016	186.4	9	33.38	27.43	88	69	1.6	4.4
July, 2016	158.4	9	31.89	27.02	87	69	0.9	3.8
August, 2016	182.0	10	33.20	27.31	85	63	0.4	5.2
September, 2016	352.1	18	30.77	26.51	92	78	0.1	3.4
October, 2016	183.4	7	31.84	24.65	85	55	0.1	5.7
November, 2016	0.6	0	31.33	20.18	87	43	0.1	7.5
December, 2016	0	0	30.52	18.97	86	44	0.2	6.3
Total/Mean	1272.1	59	32.8	24.6	87.4	56.1	1.14	6.6

AGRONOMY

- 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 : III year (First Ratoon)
 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 2016-17 finalized during the 31st Biennial workshop of AICRP(Sugarcane) held on 15th & 16th December,2015 at Pusa, Bihar.

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 @ 20 t/ha + 50% RDF	Application of FYM @ 20 t/ ha + 50%	Application of FYM @ 20 t/ ha + 50% RDF
T5	Application of FYM @ 20 t/ha + 100% RDF (inorganic source).	Application of FYM @ 20 t / ha + 100% RDF (inorganic source).	Application of FYM @ 20 tonnes / ha + 100% RDF (inorganic source).
T6	Application of FYM @ 20 t/ha + inorganic nutrient application based on soil test(rating chart)	Application of FYM @ 20 t / ha + in organic nutrient application based on soil test (NPK application).	Application of FYM @ 20 t/ ha + in organic nutrient application based on soil test (NPK application).
T7	Application of FYM @ 10 t/ha + Biofertilizer (Azotobacter + PSB) + 50% RDF	Application of FYM @ 10 t / ha + bio-fertilizer (Azotobacter + PSB) + 50% RDF.	Application of FYM @ 10 t / ha + bio-fertilizer (Azotobacter + PSB) + 50% RDF.
T8	Application of FYM/Compost @ 10 tonnes/ha + Biofertilizer (Azotobacter + PSB) + 100%RDF	Application of FYM / Compost @ 10 tonnes / ha + bio-fertilizer (Azotobacter / Acetobacter + PSB) + 100% RDF.	Application of FYM / Compost @ 10 tonnes / ha + bio-fertilizer (Azotobacter + PSB) + 100% RDF.
T9	Application of FYM @ 10 t/ha + Biofertilizer (Azotobacter + PSB) + Soil test basis	Application of FYM @ 10 t/ ha + bio-fertilizer (Azotobacter + PSB) + soil test basis (NPK application).	Application of FYM @ 10 t/ ha + bio-fertilizer (Azotobacter+ 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 : 8.2.2016
- h. Date of harvesting : 30.12.2016
- 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 (Agronomy)
 4. Dr. N. Raj Kumar, Scientist (Plant Pathology)
 5. Dr. K. V. Ramana Murthy, Principal Scientist (Agronomy)
- j. Year of trial : III year
- k. Results recorded previously : During 2015-16 season application of FYM @ 10 t/ha + Biofertilizer + inorganic nutrient application based on soil test (95.6 t/ha) or application of FYM @ 10 t/ha + Biofertilizer + 100% RDF (95.4 t/ha) registered significantly higher cane yield as compared to the other treatments. Application of only 50% RDF registered lowest cane yield of 80.4 t/ha.

I. Data recorded during the year:

Initial soil analysis:

Initial soil analysis for raising ratoon crop was done in T3, T6 and T9 treatments separately as these three treatments receive fertilizers based on soil test unlike other treatments. The initial soil test results showed that the experimental soil is neutral in pH (7.1 to 7.3), normal in E.C. (1.10 to 1.14 dS/m), low in organic carbon (0.4% - 0.42%), low in available nitrogen (220-228 Kg N/ha), medium in available phosphorus (52.0 – 60.2 kg/ha), high in available potassium (260-284 kg K₂O/ha).

Post harvest soil analysis: (After harvest of first ratoon):

Soil samples were collected and analysed during first week of January, 2017 in all replicated treatments after harvest of first ratoon and presented in Table-2. pH is neutral in all treatments and ranged between 7.0 to 7.33. EC is normal and no specific trend was observed in case of other soil parameters. In T1, T2 and T3 treatments where FYM was not applied, organic carbon values in these treatments are comparatively low (Table-1).

Tiller population at 120 DAR:

At 120 days after ratooning, integrated application of FYM, bio-fertilizer along with inorganic fertilizers found to give significantly higher number of tiller population (1,53,472/ha) followed by application of FYM@10 t/ha + Biofertilizer + inorganic nutrient

application on soil test basis (1,51,736/ha) as compared to the other treatments. Spreading of trash @ 10t/ha and application of 50 % RDF treatment (T1) recorded lowest number of tillers (1,26,389/ha).

Number of millable canes/ha:

Significant differences were observed in number of millable canes due to different organic and inorganic treatments. Application of FYM @ 10 t/ha + Biofertilizer (Azotobacter + PSB) + inorganic nutrient application based on soil test basis(82,639 /ha) or application of 100% RDF (82,630/ha) recorded significantly higher number of millable canes at harvest. Number of millable canes recorded in application of FYM @ 20 t/ha + inorganic nutrient application based on soil test (81,597/ha) or application of FYM @20 t/ha + 100% RDF through inorganic source (80,555/ha) or application of trash at 10 t/ha + Soil Test based recommendation (78,117/ha) treatments were on par. Significantly lower number of millable canes were recorded in trash at 10 t/ha + 50% RDF (65,972/ha).

Juice sucrose (%):

Cane juices were analyzed for sucrose content at harvest (Table-2). Per cent juice sucrose values did not vary significantly due to different organic and inorganic treatments. However, the per cent juice sucrose values in different treatments varied between 15.94 to 17.8.

Commercial cane sugar (%):

Commercial cane sugar was calculated treatment wise and presented in table-2. CCS% did not vary significantly due to different treatments.

Cane yield (t/ha):

Cane yield was recorded at harvest and presented in Table -2 . Application of FYM @10 t/ha + biofertilizer+100% RDF (89.9 t/ha) or Application of FYM @ 10 t/ha + Biofertilizer + inorganic nutrient application based on soil test registered significantly higher cane yield of 89.3 t/ha as compared to application of 50 % RDF+FYM@20 t/ha (71.2 t/ha) or application of FYM @10 t/ha + Biofertilizer (Azotobacter+ PSB)+50% RDF (81.2 t/ha) or application of trash at 10 t/ha + fertilizers based on soil test (83.3 t/ha) or application of trash at 10 t/ha + 100% RDF (84.6 t/ha) but found on par with application of FYM @20 t/ha + inorganic nutrient application based on soil test (89.4 t/ha) or application of FYM @20 t/ha + 100% RDF through inorganic source (88.5 t/ha).

Sugar yield:

Sugar yield was computed treatment wise. In different treatments sugar yield ranged from 9.7 to 11.9 t/ha.

Summary:

Studies on impact of integrated application of organics and in-organics in improving soil health and ratoon sugarcane productivity was studied at Regional Agricultural Research Station, Anakapalle during 2016-17season. The results indicated that application of FYM @ 10 t/ha+ Biofertilizer+ 100% RDF (89.9 t/ha) or application of FYM @ 10 t/ha + Biofertilizer+inorganic nutrient application based on soil test (89.6 t/ha) registered significantly higher cane yield as compared to the other treatments. Application of trash at 10 t/ha + 50% RDF registered lowest cane yield of 76.4 t/ha.

Table1- Soil physical and chemical properties as influenced by different treatments

Treatment	pH	E.C	O.C (%)	Avail.N (Kg/ha)	Avail. P₂O₅ (Kg/ha)	Avail. K₂O (Kg/ha)
Application of trash at 10 t/ha + 50% RDF	7.33	0.53	0.50	213	88.05	209.07
Application of trash at 10 t/ha + 100% RDF	7.06	0.36	0.58	226	81.24	179.2
Application of trash at 10 t/ha + Soil Test based recommendation	7.00	0.40	0.48	188	82.04	179.2
Application of FYM @20 t/ha + 50% RDF(inorganic source)	7.18	0.36	0.87	213	87.06	216.5
Application of FYM/@20 t/ha + 100% RDF(inorganic source)	7.32	0.39	0.80	226	83.50	190.4
Application of FYMt@20 t/ha + inorganic nutrient application based on soil test	7.06	0.64	0.70	196	84.22	209.1
Application of FYM @10 t/ha + Biofertilizer (Azatobacter +PSB)+50% RDF	7.15	0.36	0.70	339	75.15	194.1
Application of FYM @10 t/ha + biofertilizer+100% RDF	7.21	0.15	0.88	176	81.68	190.4
Application of FYMt@10 t/ha + Biofertilizer inorganic nutrient application on soil test basis	7.25	0.23	0.76	176	69.59	168.0

Table-2: Yield attributes, yield and quality of sugarcane-Ratoon as influenced by application of different organic and inorganic nutrients during 2016-17.

Treatment	Tiller population at 120 DAR	NMC/ha	Cane yield (t/ha)	Juice Sucrose (%)	CCS (%)	Sugar yield (t/ha)
Application of trash at 10 t/ha + 50% RDF	1,26,389	65,972	76.4	15.96	11.6	8.9
Application of trash at 10 t/ha + 100% RDF	1,40,972	76,389	84.6	16.30	11.8	10.0
Application of trash at 10 t/ha + Soil Test based recommendation	1,38,889	78,117	83.3	15.94	11.6	9.7
Application of FYM @20 t/ha + 50% RDF(inorganic source)	1,34,028	69,444	79.2	16.91	11.9	9.4
Application of FYM @20 t/ha + 100% RDF(inorganic source)	1,33,680	80,555	88.5	16.14	11.1	9.8
Application of FYM @20 t/ha + inorganic nutrient application based on soil test	1,45,139	81,597	89.2	16.23	11.4	10.2
Application of FYM @10 t/ha + Biofertilizer (Azatobacter + PSB)+50% RDF	1,46,527	72,829	81.6	16.31	12.4	10.1
Application of FYM @10 t/ha + biofertilizer+100% RDF	1,53,472	82,630	89.9	16.54	12.5	11.2
Application of FYMt@10 t/ha + Biofertilizer + inorganic nutrient application on soil test basis	1,51,736	82,639	89.6	17.80	13.3	11.9
SEm±	1132.0	1317.0	1.20	0.54	0.45	-
C.D (0.05)	3393.0	3944.0	3.40	NS	NS	-
C.V(%)	8.9	6.0	4.7	5.7	5.2	-

- I. V. Project No : AS 69
- VI. Project Title : Use of plant growth regulators (PGRs) for enhanced yield and quality of sugarcane
- VII. Serial number of the year of experimentation : II year
- VIII. Location : Regional Agricultural Research Station, Anakapalle
- IX. Objectives : 1.To accelerate rate and extent of sugarcane germination through the use of PGRs.
2.To assess the effect of PGRs on sugarcane germination, growth, yield and juice quality.
- 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 2016-17 finalized during the 31st Biennial workshop of AICRP(Sugarcane) held on 15th & 16th December,2015 at Pusa, Bihar.
- a. Treatments : 8
T1: Conventional planting/farmers practice(3 bud setts)
T2: Planting of setts after over night soaking in water
T3: Planting of setts after over night soaking in 50 ppm ehrel solution
T4: Planting of setts after over night soaking in 100 ppm ehrel solution
T5: T1+GA₃ spray (35 ppm) at 90. 120 and 150 DAP
T6: T2+GA₃ spray (35 ppm) at 90. 120 and 150 DAP
T7: T3+GA₃ spray (35 ppm) at 90. 120 and 150 DAP
T8: T4+GA₃ spray (35 ppm) at 90. 120 and 150 DAP
- b. Design : RBD
- c. Replications : Three
- d. Plot size : 6.0 m X 5.4 m (8 rows)
- g. Date of planting : 17.2.2016
- h.Date of harvesting : 27.01.2017

- i. Designation and name of the Participants :
1. Dr. V. Gouri, Scientist (Agronomy)
 2. Dr.Ch.Mukund Rao, Principal Scientist(Plant Physiology)
 3. Dr.M.Bharata Lakshmi, Principal Scientist (Sugarcane)
 4. Dr.K.V.Ramana Murthy, Principal Scientist(Agronomy)
 5. Dr.T.Chitkala Devi, Principal Scientist(Agronomy)

Second Year

j. Year of Trial:

k. Results recorded previously:

During 2015-16 season. The first year experimentation results indicated that significantly higher cane yield was recorded in planting of setts after overnight soaking in 100 ppm (92.0 t/ha) or 50 ppm ethrel solution (90.6 t/ha) followed by spraying of GA₃ at 90,120 and 150 days after planting (90.6 t/ha). Conventional 3 budded sett planting recorded significantly lower cane yield of 80.0 t/ha.

I. Data recorded during the year:

Germination per cent:

Germination was recorded at 20 and 45 days after planting expressed in % and presented in table 3. At 20 DAP, significant differences were not observed due to different treatments. At 45 days, planting of setts after soaking in 50 ppm (70.6%) or 100 ppm (70.7%) ethrel solution recorded significantly higher per cent germination as compared to other treatments. Conventional 3 bud sett planting recorded significantly lower per cent germination of 53.1.

Tiller population at 90 DAP:

Number of tillers at 90 days after planting before spraying of GA₃ was recorded and data are presented in table-3. Planting of setts after soaking in 100 ppm T4 & T8 (87,500/ha and 87,760/ha respectively) or 50 ppm T3 and T7 (82,552/ha and 87,760/ha respectively) ethrel solution recorded significantly more number of tillers as compared to other treatments. Planting of setts after over night soaking in water recorded significantly lower tiller population (76,479/ha) at 90 DAP.

Tiller population at 180 DAP:

At 180 days, significant variations were observed in tiller population among the treatments. Planting of setts after over night soaking in 50 ppm (1,22,321/ha) or 100 ppm (1,23,809/ha) ethrel solution followed by spraying of GA₃ at 90, 120 and 150 days after planting recorded significantly higher number of tillers as compared to other treatments. Planting of setts after over night soaking in water recorded significantly lower number of tillers (90,703/ha).

Plant height (cm) at 90 DAP:

Plant height at 90 days after planting was recorded before spraying of GA₃ and data are presented in table -4. Plant height did not varied significantly due to different treatments. However tallest plants (110.0 cm) were observed in planting of setts after soaking in 50 ppm ethrel solution followed by GA₃ spray at 90, 120 and 150 days after planting.

Plant height (cm) at 180 DAP:

At 180 days after planting after spraying of GA₃ three times at 90,120 and 150 DAP, significant differences were observed in plant height among different treatments. Taller plants were observed in all GA₃ sprayed treatments as compared to the other treatments. Planting of setts after soaking in 50 ppm ethrel solution followed by GA₃ spray at 90, 120 and 150 days after planting treatment recorded significantly higher plant height (198.0 cm) but found on par with planting of setts after overnight soaking in water (187.0 cm) or 100ppm (197.0 cm) ethrel solution followed by spraying of GA₃ at 90, 120 and 150 days after planting. Significantly lower plant height (160.0cm) was observed in planting of setts after over night soaking in water.

Number of millable canes/ha:

Significant differences were observed in number of millable canes due to application of different plant growth regulators (Table-4)PGRs). Significantly higher number of millable canes were recorded in planting of setts after overnight soaking in 100 ppm ethrel solution followed by spraying of GA₃ at 90,120 and 150 days after planting (75,852/ha) as compared to other treatments but found on par with planting of setts after overnight soaking in 50 ppm ethrel solution (74,148/ha) followed by spraying of GA₃ at 90,120 and 150 days after planting. Conventional three budded sett planting recorded significantly lower number of millable canes (67,898/ha) at harvest.

Juice sucrose (%):

Cane juices were analysed for sucrose content at harvest (Table-3). Per cent juice sucrose values did not vary significantly due to application of PGRs. However, the per cent juice sucrose values in different treatments varied between 16.1 to 17.1.

Commercial cane sugar (%):

Commercial cane sugar was calculated treatment wise and presented in table-3. CCS% did not vary significantly due to different treatments.

Cane yield (t/ha):

Cane yield was recorded at harvest and presented in Table -3. Significantly highest cane yield (88.1 t/ha) was recorded in planting of setts after overnight soaking in 100 ppm ethrel solution and spraying of GA₃ at 90,120 and 150 days after planting but found on par with planting of setts after overnight soaking in 50 ppm ethrel solution (85.8 t/ha) and spraying of GA₃ at 90,120 and 150 days after planting. Conventional 3 budded sett planting recorded significantly lower cane yield of 73.3 t/ha.

Sugar yield:

Sugar yield was computed treatment wise. Sugar yield did not varied significantly due to different treatments but highest sugar yield (10.2 t/ha) was recorded with T8 treatment i.e planting of setts after overnight soaking in 100 ppm ethrel solution followed by spraying of GA₃ at 90,120 and 150 days after planting.

Summary:

Studies on use of plant growth regulators (PGRs) for enhanced yield and quality of sugarcane was studied at Regional Agricultural Research Station, Anakapalle during 2016-17 season. The experimental results indicated that significantly higher cane yield was recorded in planting of setts after overnight soaking in 100 ppm (88.1 t/ha) or 50 ppm ethrel solution (85.8 t/ha) followed by spraying of GA₃ at 90,120 and 150 days after planting. Conventional 3 budded sett planting recorded significantly lower cane yield of 73.3 t/ha.

Table:3- Yield attributes of sugarcane as influenced by application of Plant Growth Regulators (PGRs) during 2016-17

Treatment	Germination % at 20 DAP	Germination % at 45 DAP	Tiller population at 90 DAP/ha	Tiller population at 180 DAP/ha	Plant height at 90 DAP (cm)	Plant height at 180 DAP (cm)	NMC/ha	Cane yield (t/ha)	Juice sucrose per cent	CCS per cent	Sugar Yield (t/ha)
T1:Conventional 3 bud sett planting	43.2	53.1	76,479	90,703	108.2	161.8	67,898	73.3	17.1	11.9	8.7
T2:Planting of setts after over night soaking in water	45.6	59.5	78,125	1,05,159	108.0	160.0	68,182	74.4	17.7	12.7	9.5
T3:Planting of setts after over night soaking in 50 ppm ethrel solution	50.4	70.6	82,552	1,07,656	105.7	162.8	69,886	79.0	16.8	11.5	9.1
T4:Planting of setts after over night soaking in 100 ppm ethrel solution	52.9	70.7	87,500	1,17,261	105.8	165.0	71,023	79.5	17.3	11.9	9.5
T5:T1+GA₃ Spray (35 ppm) at 90,120 and 150 DAP	45.3	61.7	80,110	99,479	105.8	182.0	71,875	81.5	16.8	11.5	9.4
T6:T2+GA₃ Spray (35 ppm) at 90,120 and 150 DAP	49.5	65.9	82,180	1,03,125	107.9	187.0	72,727	82.4	16.4	11.4	9.4
T7: T3+GA₃ Spray (35 ppm) at 90,120 and 150 DAP	51.5	70.7	88,542	1,22,321	110.0	198.0	74,148	85.8	16.1	10.9	9.4
T8: T4+GA₃ Spray (35 ppm) at 90,120 and 150 DAP	55.0	70.8	87,760	1,23,809	108.7	197.0	75,852	88.1	16.5	11.6	10.2
SEm_±	3.9	2.0	680.0	794.0	1.10	3.7	938.0	1.35	0.88	0.78	-
C.D (0.05)	NS	6.1	2062.0	2407	NS	11.3	2847	4.10	NS	NS	-
C.V (%)	4.3	5.3	4.7	5.2	5.0	3.7	4.3	4.9	9.0	8.7	-

- I. V. Project No : AS 70
- VI. Project Title :
Studies on scheduling irrigation with mulch in sugarcane
- VII. Serial number of the year of experimentation : I year
- VIII. Location : Regional Agricultural Research Station, Anakapalle
- IX. Objectives : To enhance crop and water productivity in sugarcane
- 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 2016-17 finalized during the 31st Biennial workshop of AICRP(Sugarcane) held on 15th & 16th December,2015 at Pusa, Bihar.
- a. Treatments : **Main plots: Irrigation Schedules (IW/CPE)**
I₁- 0.60
I₂- 0.80
I₃- 1.0
- Sub plots: Mulching**
- T1: Furrow planting (120 cm row spacing) with out mulching
T2: Furrow planting (120 cm row spacing) with mulching of green manure (sunhemp) sowing at 30 DAP, mulching at 75 DAP & earthing up at 110 DAP
T3- Furrow planting (120 cm row spacing) with alternate skip furrow irrigation after earthing up with out mulching
T4- Furrow planting (120 cm row spacing) with alternate skip furrow irrigation after earthing up + green manure mulching
- b. Design : Strip Plot Design
- c. Replications : Three
- d. Plot size : 6.0 m X 4.8 m (4 rows)
- g. Date of planting : 08.03.2016
h.Date of harvesting : 28.1.2017
- i. Designation and name of the Participants :
1. Dr. V. Gouri, Scientist (Agronomy)
2. Dr. M.Bharata Lakshmi, Principal Scientist (Agronomy)
3. Dr.K.V.RamanaMurthy, Principal Scientist(Agronomy)
4. Dr. T.Chitkala Devi, Principal Scientist(Agronomy)
5. Dr. MBGS.kumari, Scientist(Agronomy)
- .j. Year of Trial: First Year
- k. Results recorded previously: New trial

I. Data recorded during the year:

Germination per cent:

Germination was recorded at 45 days after planting expressed in % and presented in table-4. Significant differences were not observed due to different treatments. However, Scheduling irrigations at 1.0 IW/CPE (I₃) recorded highest per cent germination of 86.7 %. All mulching treatments with furrow or alternate furrow irrigation methods recorded more or less similar germination per cent ranging between 83.2 to 85.4

Tiller population at 150 DAP:

At 180 days, significant variations were observed in tiller population among different irrigation and mulching treatments. Scheduling irrigations at 1.0 IW/CPE (I₃) recorded significantly more number of tillers (88,136/ha) as compared to (I₁) Scheduling irrigations at 0.8 IW/CPE (83,488/ha) but found on par with I₂ i.e scheduling irrigation at 0.8 IW/CPE (86,439/ha). Significant variations were not observed in tiller population at 150 DAP due to different mulching treatments. However furrow irrigation with sunhemp mulch recorded more number of tillers (87423/ha) at 150 DAP.

Length of Millable Cane (cm):

Length of the millable cane was measured at harvest in cm and data are presented in Table-4. Significantly longer canes of 319.3 cm were recorded in scheduling irrigations at 1.0 IW/CPE (I₃) as compared to I₂ (309.0cm) and I₁ (306.4 cm) treatments. Length of millable cane did not varied significantly due to different mulching treatments.

Number of millable canes/ha:

Significant differences were observed in number of millable canes at harvest due to irrigation and mulching treatments. Scheduling irrigations at frequent intervals (1.0 IW/CPE) (I₃) recorded significantly more number of millable canes (65,997/ha) at harvest as compared to less number of irrigations at longer intervals i.e I₂ (60,292 /ha) and I₁ (58,433/ha) treatments. Furrow irrigation with sun hemp mulch recorded significantly more number of millable canes (63,029/ha) as compared to alternate furrow irrigation with out mulch (60,152/ha) and with mulch (61144 /ha) but found on par with furrow irrigation with out mulching (61970/ha).

Juice sucrose (%):

Cane juices were analysed for sucrose content at harvest (Table-4). Per cent juice sucrose values did not vary significantly due to irrigation schedules or mulching treatments.

Commercial cane sugar (%):

Commercial cane sugar was calculated treatment wise and presented in table-4. CCS% did not vary significantly due to different treatments.

Cane yield (t/ha):

Cane yield was recorded at harvest and presented in Table -4. Significantly higher cane yield (87.7 t/ha) was recorded in scheduling irrigations at frequent intervals at 1.0 IW/CPE (I₃) as compared to scheduling irrigations at longer intervals at 0.6 Iw/CPE (78.1 t/ha) and 0.8 IW/CPE (81.3 t/ha) treatments. Significant differences in cane yield were not observed due to different mulching treatments. However furrow irrigation with mulching recorded higher cane yield of 84.8 t/ha.

Sugar yield:

Sugar yield was computed treatment wise. Sugar yield did not varied significantly due to different treatments but highest sugar yield (11.4 t/ha) was recorded in scheduling irrigation at 1.0 IW/CPE ratio. Among different mulching treatments Furrow irrigation with out mulching recorded highest juice sucrose percent of 19.3.

Water Productivity (t/ha-cm):

Scheduling irrigations to sugarcane at 1.0 IW/CPE with 15 irrigations, received 112.5 ha-cm irrigation water and recorded lowest water productivity of 0.78t/ha-cm where as scheduling irrigations at 0.6 IW/CPE which received 60.0 ha-cm irrigation water with 8 irrigations recorded highest water productivity of 1.38 (Table-5).

Summary:

Studies on scheduling irrigation with mulch in sugarcane carried out at Regional Agricultural Research Station, Anakapalle during 2016-17 season. First year experimentation results indicated that significantly higher cane yield (87.7 t/ha) was recorded in scheduling more number of irrigations at 1.0 IW/CPE (I_3) as compared to scheduling irrigations at I_1 (78.1 t/ha) and I_2 (81.3 t/ha) treatments. Significant differences in cane yield were not observed due to different mulching treatments. However furrow irrigation with mulching recorded higher cane yield of 84.80t/ha. Scheduling irrigations at 0.6 IW/CPE registered highest water productivity of 1.38.

Table 4: Yield and quality of sugarcane as effected by irrigation & mulching treatment during 2016-17

Treatment	Germination (%)	Tiller population/ha at 150 DAP	LMC (cm)	NMC/ha	Cane yield (t/ha)	Juice sucrose (%)	CCS (%)	Sugar Yield (t/ha)
Irrigation (IW/CPE)								
I ₁ - 0.6	82.30	83,488	306.5	58433	78.1	19.06	13.7	10.7
I ₂ -0.8	84.20	86,439	309.0	60292	81.3	19.09	13.8	11.2
I ₃ -1.0	86.70	88136	319.3	65997	87.7	18.80	13.0	11.4
SEm ±	-	668.0	3.3	630.0	1.30	0.17	0.30	-
C.D (0.05)	NS	2622.0	9.72	2470.0	4.0	NS	NS	-
Mulching								
T1-Furrow irrigation with out mulching	83.5	86712	310.9	61970	81.80	19.3	13.7	11.2
T2-Furrow irrigation with mulching	83.2	87423	316.6	63029	84.80	18.9	13.7	11.6
T3-Alternate Furrow irrigation with out mulching	85.4	86525	304.8	60152	80.90	19.06	13.5	10.9
T3-Alternate Furrow irrigation with mulching	84.8	86368	307.3	61144	81.90	18.70	13.1	10.7
SEm ±	-	459.0	4.0	465.0	1.4	0.20	0.17	
C.D (0.05)	NS	NS	NS	1381.0	NS	NS	NS	
Interaction		NS	NS	NS	NS	NS	NS	

Table 5: Effect of Irrigation treatments on water use and WUE

Irrigation (IW/CPE)	No.of Irrigations given	Quantity of water applied (ha-cm)	Cane yield (t/ha)	Water Productivity (t/ha-cm)
I ₁ - 0.6	8	60.0	78.1	1.30
I ₂ -0.8	11	82.5	81.3	1.00
I ₃ -1.0	15	112.5	87.7	0.78

- I. V. Project No : AS 71
 VI. Project Title : Carbon sequestration assessment in sugarcane based cropping system
- VII. Serial number of the year of experimentation : I year
- VIII. Location : Regional Agricultural Research Station, Anakapalle
- IX. Objectives : To improve the total soil organic carbon build up and sustain crop yields
- 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 2016-17 finalized during the 31st Biennial workshop of AICRP(Sugarcane) held on 15th & 16th December,2015 at Pusa, Bihar.
- a. Treatments : 8
 T1-Soyabean-Maize
 T2-Sugarcane-Ratoon-cowpea/urd bean/moong bean
 T3- Sugarcane-Ratoon-(trash mulching with out *Trichoderma*)-Maize
 T4- Sugarcane-Ratoon-(trash removal with out *Trichoderma*)-Maize
 T5- Sugarcane-Ratoon-(trash mulching with *Trichoderma*)-Maize
 T6- Sugarcane-Ratoon-Maize(trash incorporation through rotavator & *Trichoderma* incorporation before sowing of Maize)
 T7-Sugarcane-Ratoon-Maize(Zero tilled) with out *Trichoderma*
 T8-Sugarcane-Ratoon-Maize (Zero tilled) with *Trichoderma*
- b. Design : RBD
- c. Replications : Three
- d. Plot size : 6.0 m X 4.8 m (6 rows)
- g. Date of planting : 14.2.2016
- h. Date of harvesting : 20.2.2017
- i. Designation and name of the Participants :
 Dr. V. Gouri, Scientist (Agronomy)
 Dr. Ch.S.Ramalaksmi, Scientist(SSAC)
 Dr. M.Bharata Lakshmi, Principal Scientist (Agronomy)
 Dr. K.V.Ramana Murthy, Principal Scientist(Agronomy)
 Dr. T.Chitkala Devi, Principal Scientist(Agronomy)
 Dr. MBGS.kumari, Scientist(Agronomy)
- j. Year of Trial : First Year
- k. Results recorded previously: New Trial
- l. Data recorded during the year:

Initial soil analysis:

Initial soil analysis was done depth wise from 0-15 cm to 30-45 cm and the data are furnished in the following table.

Soil Depth (cm)	pH	E.C (dS/m)	O.C (%)	Available Nitrogen (Kg/ha)	Available P ₂ O ₅ (Kg/ha)	Available (K ₂ O (Kg/ha)
0-15	7.22	0.189	0.64	258	79.6	258
15-30	7.30	0.192	0.68	247	81.0	179
30-45	7.26	0.176	0.60	221	63	134

Germination per cent:

Germination was recorded at 45 days after planting expressed in % and presented in table-6. Not much variation was observed in per cent germination of Sugarcane.

Number of millable Canes/ha: Significant differences were not observed in number of millable canes (Table-6).

Juice sucrose (%):

Cane juices were analysed for sucrose content at harvest (Table-6). Per cent juice sucrose values did not vary significantly among different sugarcane plots.

Commercial cane sugar (%):

Commercial cane sugar was calculated treatment wise and presented in table-6. CCS% did not vary significantly.

Cane yield and Sugar Yield (t/ha):

More or less similar Cane yield and Sugar Yield were recorded in all sugarcane plots (Table-6).

- Soil samples given for analysis in Department of Soil Science & Agriculture Chemistry and analysis of soil samples is in progress.

Soyabean and Maize:

Soyabean crop was sown during first week of June, 2016 and harvested during second week of September, 2016. After harvesting of soyabean crop soil samples were collected depth wise. Due to the continuous rainfall sowing of maize crop after harvesting the soyabean is delayed and maize crop was sown during third week of October, 2016. Soyabean crop establishment was poor due to continuous rainfall (186.4 mm) in the month of June, 2016 and recorded seed yield of 520 Kg/ha. Maize sown after soyabean performed better and gave green cob yield of 20,500/ha (Table-7).

Summary:

Studies on Carbon sequestration assessment in sugarcane based cropping system was studied at Regional Agricultural Research Station, Anakapalle during 2016-17 season. First year experimentation results indicated that there is no significant variations in yield and quality of sugarcane plant crop in T2 to T8 treatments. After harvesting the cane soil samples were collected in every treatment replication wise and kept ready for soil analysis. Soyabean crop was sown during first week of June, 2016 and harvested during second week of September, 2016. After harvesting the soyabean crop soil samples were collected depth wise. Due to the continuous rainfall sowing of maize crop after harvesting of soyabean was delayed and maize crop was sown during third week of October, 2016. Soyabean crop establishment was poor due to continuous rainfall (186.4 mm) in the month of June, 2016 and recorded grain yield of 520 Kg/ha. Maize sown after soyabean performed better and gave green cob yield of 20,500/ha

Table 6. Yield parameters and yield of sugarcane during 2016-17

Treatment	Germination per cent	NMC /ha	Cane yield (t/ha)	Juice sucrose (%)	CCS (%)
T2:Sugarcane-Ratoon-cowpea	65.8	75,521	89.8	17.6	13.58
T3: Sugarcane-Ratoon-(trash mulching with out <i>Trichoderma</i>)-Maize	67.0	76,302	91.1	18.02	13.99
T4:Sugarcane-Ratoon-(trash removal with out <i>Trichoderma</i>)-Maize	68.9	77,343	92.4	17.4	13.31
T5:Sugarcane-Ratoon-(trash mulching with <i>Trichoderma</i>)-Maize	65.5	76,042	90.6	17.7	12.82
T6:Sugarcane-Ratoon-Maize(trash incorporation through rotavator & <i>Trichoderma</i> incorporation before sowing of Maize)	66.0	76,823	91.7	16.9	12.78
T7:Sugarcane-Ratoon-Maize(Zero tilled) with out <i>Trichoderma</i>	67.2	75,520	89.8	17.5	12.92
T8:Sugarcane-Ratoon-Maize (Zero tilled) with <i>Trichoderma</i>	70.5	77,604	92.9	17.3	13.20
SEm ±	1.9	1556.0	3.2	0.40	0.48
C.D (0.05)	NS	NS	NS	NS	NS

Table 7 .Other crop yields during 2016-17

Treatment	Yield (Kg/ha)
T1:Soya bean - Maize	
Soya bean	520
Maize	20,500 green cobs

- I. V. Project No : AS 72
- VI. Project Title : Agronomic evaluation of elite sugarcane genotypes (Early Group)
- VII. Serial number of the year of experimentation : I year
- VIII. Location : Regional Agricultural Research Station, Anakapalle
- IX. Objectives : To exploit the maximum potential yield of promising sugarcane genotypes with optimum nutrient application .
- 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 2016-17 finalized during the 31st Biennial workshop of AICRP(Sugarcane) held on 15th & 16th December,2015 at Pusa, Bihar.
- a. Treatments :
 Varieties : Eight
 V1- CoA12321
 V2- CoA12322
 V3- CoA12323
 V4-Co Or 12346
 V5-Co V 12356
 V6- Co 6907 (Check)
 V7-CoC 01061 (Check)
 V8-Co A92081 (Check)
- b. Design : RBD
- c. Replications : Three
- d. Plot size : 6.0 m X 6 rows
- e. Manuring : 125% of RDF
Recommended dose:
 112kg N + 100kg P₂O₅ + 120kg K₂O / ha.
 Entire dose of phosphorous and potassium was applied as basal at the time of planting. Nitrogen was applied in two equal split doses at 45 DAP and 90 DAP.
- 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 : 3.3.2016
- h. Date of harvesting : 10.12.2017
- i. Designation and name of the Participants :
 1. Dr. V. Gouri, Scientist (Agronomy)
 2. Dr. M. Bharata Lakshmi, PrincipalScientist Agronomy)
 3. Dr.K. Ramana Murthy, Principal Scientist (Agronomy)
 4. Dr. T. ChitkalaDevi, Principal Scientist (Agronomy)
 5. Dr. MBGS.Kumari, Scientist (Agronomy)
- j. Year of trial : I year
- k. Results recorded previously : New trial

I. Data recorded during the year:

Initial soil analysis :

Initial soil analysis was done. The experimental soil is neutral in pH (7.46), normal in E.C (0.18 dS/m), low in organic carbon (056%), low in available nitrogen (241 kg N/ha), high in available phosphorus (66.5 kg/ha) and high in available potassium (242 kg K₂O/ha).

Germination per cent:

Germination per cent was recorded at 35 days after planting expressed in % and presented in table-9. Among the five new genotypes Co Or 12346 recorded highest percent germination of 89.5 followed by Co A 12323 (82.2%). Lowest percent germination was recorded with the check variety Co C 01061.

Tiller population at 180 DAP:

Tiller population at 180 DAP of different new early sugarcane genotypes varied significantly. Among different new early sugarcane genotypes Co Or 12346 recorded significantly higher tiller population of 1,28,093 but found on par with all other genotypes except Co A 12321 (1,19,791/ha), Co A 12322 (1,05,902/ha) and the check variety Co 6907 (1,21,643/ha).

Number of millable canes/ha:

Number of millable canes at harvest varied significantly among different sugarcane genotypes (Table 8). At harvest Co A 12322 recorded significantly higher number of millable canes of 76.6 thousands/ha as compared to the other zonal varieties Co or 12346, Co A 12321 and three check varieties Co C 01061, Co A 92081 and Co 6907 but found on par with Co A 12323, Co V 12356.

Due to continuous rains during the month of September certain pests & diseases were observed in some varieties. Co Or 12346 variety is severely infested with red rot disease in three replications and crop completely dried whereas Co A 92081 effected by smut.

Cane yield (t/ha):

Cane yield per plot was recorded at harvest expressed in t/ha and presented in Table 9. Cane yield of new early sugarcane genotypes under irrigated conditions varied significantly. Among the new early sugarcane genotypes under test, CoA12322 (89.8 t/ha) followed by Co V 12356 (87.1 t/ha) and Co A 12323 (86.9 t/ha) recorded significantly higher cane yield as compared to other new sugarcane genotypes and also check varieties (Table-8).

Juice Sucrose (%):

Significant differences in juice sucrose (%) were not observed with different new early genotypes. However, Co A 12323 recorded highest per cent juice sucrose of 18.4.

Commercial cane sugar (%):

Commercial cane sugar percent was calculated treatment wise. Commercial cane sugar percent did not varied with different genotypes. Among the different early sugarcane genotypes Co A 12323 recorded higher CCS % of 11.67.

Sugar yield (t/ha):

Sugar yield was calculated based on CCS% and cane yield. Significant variations were not found in sugar yield among different sugarcane genotypes.

Summary:

Performance of new promising early sugarcane genotypes viz., Co A 12321, Co A 12322, Co A 12323, Co Or 12346, Co V 12356 along with the check varieties Co 6907, Co C 01061 and Co A 92081 under irrigated conditions were studied at Regional Agricultural Research Station, Anakapalle during 2016-17 season. Among the five new early genotypes under test CoA12322 proved superior (89.8 t/ha) as compared to other genotypes but found on par with Co V 12356 (87.1 t/ha) and Co A 12323 (86.9 t/ha).

Table -8: Yield and quality of elite sugarcane genotypes (Early group) under irrigated conditions during 2016-17

Treatment	Germination (%)	Shoot population at 180 DAP	NMC/ha	Cane yield (t/ha)	Juice sucrose (%)	CCS (%)	Sugar yield (t/ha)
Varieties:							
CoA12321 (2006 A 64)	79.8	1,19,791	75,000	85.8	16.3	10.13	8.7
CoA12322 (2006 A 102)	77.4	1,05,902	76,667	89.8	18.0	11.1	9.7
CoA12323 (2006 A 223)	82.2	86,954	76,112	86.9	18.4	11.67	10.4
Co or 12346	89.5	1,28,093	70,833	76.9	16.2	10.43	8.0
CoV12356	75.6	1,23,031	75,556	87.1	17.1	10.43	9.0
Co 6907	86.1	1,27,546	74,800	86.1	17.2	10.85	9.3
CoC01061	76.3	1,21,643	73,890	84.1	17.7	10.44	8.8
Co A92081	82.2	96,065	70,445	77.8	16.7	11.63	9.0
SEm ±	4.4	5658	544.0	0.95	0.60	-	-
C.D (0.05)	NS	17159	1650	2.9	NS	NS	-
C.V(%)	9.5	8.6	5.6	5.0	5.7	7.0	-

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