

ACHARYA N.G.RANGA AGRICULTURAL UNIVERSITY



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To
The Project Co-ordinator,
AICRP on Sugarcane,
IISR, Lucknow,
Uttar Pradesh – 226 002

Lr. No. A /561/2012 dt.18.6.2012

Sir,

Sub: RARS, Anakapalle – Annual Report of AICRP on Sugarcane - Agronomy for the year 2011-12- Submitted – Regarding.

Ref: F. No. 17-33/2011-PCS dt. 18.4.2012 of the Project Co-ordinator (Sugarcane), IISR, Lucknow.

With reference to the letter cited above, I submit to enclose herewith the Annual report of AICRP on Sugarcane pertaining to Agronomy discipline for the year 2011-12 for favour of kind perusal.

Yours faithfully

Associate Director of Research
RARS, Anakapalle

Copy submitted to

Dr. V.P. Singh, Principal Investigator (Crop Production) AICRP on Sugarcane &
Director of Research, Rajendra Agricultural University, Pusa – 848 125, Samastipur
district, Bihar.

Copy to the Principal Scientist (Sugarcane), Regional Agricultural Research
Station, Anakapalle for information.

ANNUAL REPORT FOR THE YEAR 2011-12

AICRP on Sugarcane

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 2011-12 finalized during Biennial workshop of AICRP (Sugarcane) held at Navsari Agricultural University, Navsari, Gujarat from 27th to 29th October, 2010.
- a. Treatments :
Varieties : Three
V1: 96 A 3
V2: 99 A 5
V3: Co 7219
Nitrogen levels : Three
F1: 75% of the recommended dose of N
F2: 100% of the recommended dose of N
F3: 125% of the recommended dose of N
- b. Design : Factorial RBD
- c. Replications : Three
- d. Plot size : 10.0 m X 6.4 m
- e. Manuring : As per the treatments
Recommended dose:
112kg N + 100kg P₂O₅ + 120kg K₂O / ha.
Entire dose of phosphorous 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. Once in 21 days during maturity phase from November till harvest.
- g. Date of harvesting : 19.01.2012
- h. Designation and name of the Participants : Dr. T. Chitkala Devi, Senior Scientist (Agronomy)
Dr. V. Gouri, Scientist (Agronomy)
Dr. MBGS. Kumari, Scientist (Agronomy)
Dr. T. Sreelatha, Senior Scientist (Soil Science)

- i. Year of trial : Dr. K. Prasada Rao, Principal Scientist,(Sugarcane)
II Year
- j. Results recorded previously : During 2010-11 season, application of nitrogen at 125% recommended dose to new mid late sugarcane genotypes found to give significantly higher cane yield of 83.6 t/ha than 100% recommended nitrogen (78.2 t/ha). Both the new mid late genotypes viz., 99 A 5 (81.3 t /ha) and 96 A 3 (80.8 t / ha) registered more or less similar cane yields.
- k. Data recorded during the year:

Germination percentage:

Germination percentage was recorded at 35th day after planting (Table-1). More or less similar germination per cent was recorded at different levels of nitrogen. Both the new mid late genotypes viz., 99 A 5 (73.1 %) and 96 A 3 (72.5 %) registered more or less similar per cent germination.

Percent Juice sucrose:

Cane juices were analysed for sucrose content at harvest (Table-1). Juice sucrose values did not vary significantly either due to nitrogen levels or genotypes. However, the juice sucrose values in different treatments varied between 17.80 % to 18.10 %.

Commercial cane sugar:

Commercial cane sugar (%) was calculated treatment wise. CCS% followed the same trend as that of percent juice sucrose, and it varied from 13.38 % to 13.53 %.

Number of millable canes per hectare:

Significant differences in number of millable canes at harvest were observed due to different levels of nitrogen (Table –1). Application of nitrogen at 125% recommended dose to mid late genotypes registered higher number of millable canes (78,464 / ha) than 100 % recommended nitrogen (73,358 /ha). Both the new mid late genotypes viz., 99 A 5 (75,261 /ha) and 96 A 3 (73,158 / ha) registered more or less similar number of millable canes.

Length of millable cane :

Length of millable cane (Table-1) did not vary much with different nitrogen levels or genotypes. But, higher length of cane (264.7 cm) was recorded at 100% recommended nitrogen than 75% recommended nitrogen (261.3 cm). New mid late genotype 99 A 5 (265.6 cm) registered lengthy canes than 96 A 3 (260.6 cm).

Cane yield (t/ha):

Cane yield was recorded at harvest and the data are presented in Table-1. Cane yield of new promising mid late sugarcane genotypes varied significantly due to different levels of nitrogen. Application of nitrogen at 125% recommended dose registered significantly higher cane yield of 86.4 t/ha than 100% recommended nitrogen (80.2 t/ha). Both the new mid late genotypes viz., 99 A 5 (84.0 t /ha) and 96 A 3 (82.7 t / ha) registered more or less similar cane yield. The standard check variety Co 7219 registered lower cane yield of 80.1 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., 96 A 3 and 99 A 5 along with standard check Co 7219 was studied under different levels of nitrogen under irrigated conditions at Regional Agricultural Research Station, Anakapalle during 2011-12 season. The results showed that application of nitrogen at 125% recommended dose registered significantly higher cane yield of 86.4 t/ha than 100% recommended nitrogen (80.2 t/ha). Both the new mid late genotypes viz., 99 A 5 (84.0 t /ha) and 96 A 3 (82.7 t / ha) registered more or less similar cane yield. The standard check variety Co 7219 registered lower cane yield of 80.1 t/ha.

Table: 1 Yield attributes, quality and yield of new promising sugarcane genotypes (Mid-late) as influenced by different levels of nitrogen under irrigated conditions.

Treatments	Percent germination	Number of millable Canes/ha	LMC (cm)	Percent juice sucrose	CCS (%)	Cane yield (t/ha)	Sugar yield (t/ha)
Varieties							
V1: 96A3	70.1	73158	260.6	18.08	13.58	82.7	11.2
V2: 99 A 5	73.1	75261	265.6	17.96	13.19	84.0	11.1
V3: Co 7219	72.5	72659	263.3	17.68	13.21	80.1	10.6
S.Em±	1.2	1386	5.1	0.11	0.08	2.2	-
C.D. (P = 0.05)	NS	NS	NS	NS	NS	NS	-
Nitrogen levels							
N1: 75% recommended dose of N	70.8	69256	261.3	17.89	13.38	74.7	10.0
N2: 100% recommended dose of N	72.0	73358	264.7	18.10	13.51	80.2	10.8
N3: 125% recommended dose of N	72.9	78464	263.5	17.80	13.53	86.4	11.7
S.Em±	1.2	1386	5.1	0.11	0.08	2.2	-
C.D. (P=0.05)	NS	3881	NS	NS	NS	5.5	-
Interaction: Variety x Nitrogen level	NS	NS	NS	NS	NS	NS	-
C.V. %	4.8	8.1	7.3	5.8	7.1	9.2	-

- II. V. Project No : AS 61
 VI. Project Title : Management of binding weeds in Sugarcane.
 VII. Serial number of the : III year
 year of experimentation
 VIII. Location : Regional Agricultural Research Station, Anakapalle
 IX. Objectives : To control the binding weeds effectively in sugarcane.
 X. Technical programme on : Project Coordinator, AICRP on Sugarcane, Agronomy / Soil
 which the report is based Science sub-committee.
 Technical Programme of work for the year 2011-12 finalized
 during Biennial workshop of AICRP (Sugarcane) held at
 Navsari Agricultural University, Navsari, Gujarat from 27th to
 29th October, 2010.
- a. Treatments : 10
 T1 : Control (Weedy check).
 T2 : Hoeing at 30, 60 and 90 DAP.
 T3 : Atrazine @ 2.0 kg a.i /ha fb. 2,4 -D @ 1.0kg a.i. /ha at 60 DAP.
 T4 :Atrazine @ 2.0 kg a.i /ha after 1st irrigation and hoeing followed by 2,4 -D @
 1.0kg a.i. /ha at 75 DAP.
 T5: Metribuzin @ 1.25 kg a.i /ha(pre-e) fb. 2,4 -D @ 1.0kg a.i. /ha at 75 DAP.
 T6 :Atrazine @ 2.0 kg a.i /ha(pre-e)+ Almix @ 20g / ha at 75 DAP.
 T7 : Metribuzin @ 1.25 kg a.i /ha (pre-e)+ Almix 20g / ha at 75 DAP.
 T8 : Atrazine @ 2.0 kg a.i/ha (pre-e)+ Ethoxysulfuron @ 50g a.i. /ha at 75 DAP.
 T9 : Atrazine @ 2.0 kg a.i /ha (pre-e)+ Dicamba 350g a.i. /ha at 75 DAP.
 T10:Metribuzin @ 1.25 kg a.i /ha (pre-e)+ Dicamba 350g a.i. /ha at 75DAP.
- b. Design : RBD
 c. Replications : Three
 d. Plot size : 10.0X 8.0 m
 e. Manuring : 112kg N + 100kg P2O5 + 120kg K2O / ha.
 Entire dose of phosphorous 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 : 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 harvesting : 10.01.2012
 h. Designation and name : Dr. T. Chitkala Devi, Senior Scientist (Agronomy)
 of the Participants Dr.M.B.G.S. Kumari, Scientist (Agronomy)
 Dr. V. Gouri, Scientist (Agronomy)
 Dr. K. Prasada Rao, Principal Scientist (Sugarcane)
- i. Year of trial : III year
 j. Results recorded previously : During 2009-10 season, pre – emergence spraying of
 metribuzin @ 1.25 kg a.i/ha followed by post – emergence
 application of almix @ 20 g/ha at 75 days after planting
 registered significantly higher cane yield of 86.3 t/ha than
 other herbicide applied plots but found on par with weeding
 and hoeing thrice at 30,60 and 90 days after planting (84.9
 t/ha). Next best treatment was found to be metribuzin @ 1.25
 kg a.i/ha as pre – emergence followed by Dicamba @ 350 g
 a.i/ha at 75 DAP (82.4 t/ha). Un weeded control plot gave the
 lowest cane yield of 67.5 t/ha.

During 2010-11 season, pre – emergence spraying of metribuzin @ 1.25 kg a.i/ha followed by post – emergence application of almix @ 20 g/ha at 75 days after planting registered significantly higher cane yield of 81.9 t/ha than other herbicide applied plots but found on par with weeding and hoeing thrice at 30,60 and 90 days after planting (80.1 t/ha). Next best treatment was found to be metribuzin @ 1.25 kg a.i/ha as pre – emergence followed by Dicamba @ 350 g a.i/ha at 75 DAP (78.0 t/ha). Unweeded control plot registered the lowest cane yield of 64.7 t/ha.

k. Data recorded during the year:

Percent germination

Percent germination was recorded at 35th DAP and it did not vary significantly due to different treatments (Table-2). All the pre-emergence herbicide applied plots registered higher germination percentage and it ranged from 65.1 to 69.6%. The unweeded control plot resisted lesser percent germination of 63.8%.

Weed number and fresh weight of weeds:

Binding Weed number before spraying weedicide and 120 days after spraying weedicide were recorded and presented in Table-2.

Before spraying post-emergence weedicide i.e., during formative phase of the crop the binding weed population is very less or negligible. At 120 days after spraying of post-emergence weedicides, common binding weeds observed were *Cardiospermum hispidum*, *Ipomoea carnea*, *Coccinia grandis* and *Rhynchosia minima*. Among the binding weeds *Cardiospermum hispidum* was more predominant and occupied about 70% of the total weed density. Among different weedicide combinations, pre-emergence spraying of metribuzin @ 1.25 kg a.i/ha followed by almix @ 20 g/ha at 75 DAP recorded lesser weed number (0.33 lakh/ha) which was closely followed by hoeing at 30,60 and 90 days after planting (0.29 lakh/ha). The next best treatments were, metribuzin as pre-emergence followed by 2,4-D @ 1.0 kg a.i/ha at 75 DAP (0.41 lakh/ha) or metribuzin as pre-emergence followed by Dicamba @ 350 g a.i/ha (0.43 lakh/ha) also proved effective in reducing the binding weed population as compared to other weedicide applied plots. Unweeded control plot recorded higher number of weeds (1.81 lakh/ha).

Fresh weight of binding weeds was recorded at 120 days after weedicide spray. Pre-emergence spraying of metribuzin @ 1.25 kg a.i/ha + almix @ 20 g/ha at 75 DAP recorded the lowest fresh biomass of weeds (0.83 t/ha) closely followed by hand weeding thrice at 30,60 and 90 DAP (0.91 t/ha) or metribuzin as pre-emergence followed by Dicamba @ 350 g a.i/ha (1.21 t/ha). Unweeded control plot registered the highest weed fresh biomass of 3.29 t/ha.

Number of millable canes:

Number of millable canes were recorded at harvest and the data are presented in Table-3. Pre-emergence spraying of metribuzin @ 1.25 kg a.i/ha followed by post-emergence spraying of almix @ 20 g/ha registered higher number of millable canes (84,618/ha) on par with hand weeding thrice at 30,60 and 90 DAP (83,617/ha). Metribuzin @ 1.25 kg a.i/ha as pre-emergence followed by Dicamba @ 350 g a.i/ha at 75 DAP (81,718/ha). Unweeded control plot registered the lowest number of millable canes (67,176/ha).

Juice Sucrose :

Juices were analyzed for their sucrose content at harvest. Significant difference in juice sucrose was not observed due to different weedicides. The juice sucrose values ranged from 16.71 to 17.61% in different treatments.

Cane yield (t/ha):

Cane yield varied significantly due to different weed control treatments (Table – 3). Pre – emergence spraying of metribuzin @ 1.25 kg a.i/ha followed by post – emergence application of almix @ 20 g/ha at 75 days after planting registered significantly higher cane yield of 87.3 t/ha and found on par with metribuzin @ 1.25 kg a.i/ha as pre – emergence followed by Dicamba @ 350 g a.i/ha at 75 DAP (83.0 t/ha) and conventional practice of weeding and hoeing thrice at 30,60 and 90 days after planting (86.4 t/ha). Next best treatments were found to be atrazine @ 2.0 kg a.i/ha as pre-emergence + Ethoxysulfuron @ 50g a.i. /ha at 75 DAP (81.5 t/ha) and Metribuzin @ 1.25 kg a.i /ha pre-emergence followed by 2, 4 –D @ 1.0kg a.i. /ha at 75 DAP (81.2 t/ha). Unweeded control plot registered the lowest cane yield of 66.9 t/ha.

Sugar yield (t/ha):

Sugar yield was computed treatmentwise and data are presented in Table-3. Sugar yields followed the same trend as that of cane yield.

Summary:

During 2011-12 season efficacy of different weedicides (pre – emergence and post emergence) along with conventional practice of three hoeings at 30, 60 and 90 days after planting for control of binding weeds were studied at RARS, Anakapalle. The results of the indicated that, Pre – emergence spraying of metribuzin @ 1.25 kg a.i/ha followed by post – emergence application of almix @ 20 g/ha at 75 days after planting controlled the binding weeds effectively and registered significantly higher cane yield of 87.3 t/ha and found on par with metribuzin @ 1.25 kg a.i/ha as pre – emergence followed by Dicamba @ 350 g a.i/ha at 75 DAP (83.0 t/ha) and conventional practice of weeding and hoeing thrice at 30,60 and 90 days after planting (86.4 t/ha). Next best treatments were found to be atrazine @ 2.0 kg a.i/ha as pre-emergence + Ethoxysulfuron @ 50g a.i. /ha at 75 DAP (81.5 t/ha) and Metribuzin @ 1.25 kg a.i /ha pre-emergence fb. 2,4 –D @ 1.0kg a.i. /ha at 75 DAP (81.2 t/ha). Unweeded control plot registered the lowest cane yield of 66.9 t/ha.

Pooled analysis:

The experiment was conducted for three consecutive years from 2009-10 to 2011-12. Pooled analysis was done for cane yield (Table-4). Pooled data is also indicated that Pre – emergence spraying of metribuzin @ 1.25 kg a.i/ha followed by post – emergence application of almix @ 20 g/ha at 75 days after planting (85.1 t/ha) or metribuzin @ 1.25 kg a.i/ha as pre – emergence followed by Dicamba @ 350 g a.i/ha at 75 DAP (81.1 t/ha) registered significantly higher cane yield after controlling the binding weeds effectively and found on par with and conventional practice of weeding and hoeing thrice at 30,60 and 90 days after planting (83.8 t/ha).

Table: 2 - Percent germination, Weed density (lakh/ha), weed bio mass and Weed control efficiency as influenced by different weed control treatments.

Treatment	Percent germination	Weed density before weedicide spray (lakh/ha)	Weed density at 120 days after spray (lakh/ha)	Fresh weight of binding weeds (t/ha)	Weed control efficiency (%)
T1 = Control (Weedy check).	63.8	0.19	1.81	3.29	0.0
T2 = Hoeing at 30, 60 and 90 DAP.	67.8	0.06	0.29	0.91	72.3
T3 = Atrazine @ 2.0 kg a.i /ha fb. 2,4 -D @ 1.0kg a.i. /ha at 60 DAP.	69.6	0.08	0.61	1.90	42.2
T4= Atrazine @ 2.0 kg a.i /ha after 1 st irrigation and hoeing followed by 2,4 -D @ 1.0kg a.i. /ha at 75 DAP.	66.6	0.10	0.70	1.78	45.8
T5= Metribuzin @ 1.25 kg a.i /ha(pre-e) fb. 2,4 -D @ 1.0kg a.i. /ha at 75 DAP.	64.9	0.09	0.41	1.38	58.0
T6= Atrazine @ 2.0 kg a.i /ha(pre-e)+ Almix @ 20g / ha at 75 DAP.	65.4	0.08	0.58	1.50	54.4
T7= Metribuzin @ 1.25 kg a.i /ha (pre-e)+ Almix 20g/ ha at 75 DAP.	69.2	0.05	0.33	0.83	74.7
T8= Atrazine @ 2.0 kg a.i/ha (pre-e)+ Ethoxysulfuron. @ 50g a.i. /ha at 75 DAP.	65.1	0.09	0.48	1.46	55.6
T9= Atrazine @ 2.0 kg a.i /ha (pre-e)+ Dicamba 350g a.i. /ha at 75 DAP.	65.8	0.08	0.67	1.71	48.0
T10= Metribuzin @ 1.25 kg a.i /ha (pre-e)+ Dicamba 350g a.i. /ha at 75DAP.	65.1	0.07	0.43	1.21	63.2
S.Em ±	1.5				
C.D (P=0.05)	NS				

Table: 3 - Yield attributes, quality and yield of sugarcane as influenced by different weed control treatments.

Treatment	Number of millable canes / ha	Percent juice sucrose	CCS %	Cane yield (t/ha)	Sugar yield (t/ha)
T1 = Control (Weedy check).	67176	16.89	11.98	66.9	8.0
T2 = Hoeing at 30, 60 and 90 DAP.	83617	17.61	12.78	86.4	11.0
T3 = Atrazine @ 2.0 kg a.i /ha fb. 2,4 -D @ 1.0kg a.i. /ha at 60 DAP.	74115	16.74	12.30	76.8	9.4
T4= Atrazine @ 2.0 kg a.i /ha after 1 st irrigation and hoeing followed by 2,4 -D @ 1.0kg a.i. /ha at 75 DAP.	75734	16.89	12.45	78.5	9.8
T5= Metribuzin @ 1.25 kg a.i /ha(pre-e) fb. 2,4 -D @ 1.0kg a.i. /ha at 75 DAP.	7616	16.59	12.16	81.2	9.9
T6= Atrazine @ 2.0 kg a.i /ha(pre-e)+ Almix @ 20g / ha at 75 DAP.	76002	16.68	12.48	80.6	10.0
T7= Metribuzin @ 1.25 kg a.i /ha (pre-e)+ Almix 20g / ha at 75 DAP.	84618	17.20	12.80	87.3	11.2
T8= Atrazine @ 2.0 kg a.i/ha (pre-e)+ Ethoxysulfuron. @ 50g a.i. /ha at 75 DAP.	7012	16.71	12.19	81.5	9.9
T9= Atrazine @ 2.0 kg a.i /ha (pre-e)+ Dicamba 350g a.i. /ha at 75 DAP.	75118	17.21	12.40	79.8	9.9
T10= Metribuzin @ 1.25 kg a.i / ha (pre-e)+ Dicamba 350g a.i. /ha at 75DAP.	81718	17.43	12.31	83.0	10.2
S.Em ±	1168	0.08	0.05	2.3	-
C.D (P= 0.05)	3267	NS	NS	6.3	-
C.V %	10.3	7.3	8.6	10.4	-

Table: 4 Pooled analysis data of cane yield for three years (2009-10 to 2011-12).

Treatment	Cane yield (t/ha)			
	2009-10	2010-11	2011-12	Mean yield
T1 = Control (Weedy check).	67.5	64.7	66.9	66.4
T2 = Hoeings at 30, 60 and 90 DAP.	84.9	80.1	86.4	83.8
T3 = Atrazine @ 2.0 kg a.i /ha fb. 2,4 -D @ 1.0kg a.i. /ha at 60 DAP.	76.5	72.7	76.8	75.3
T4= Atrazine @ 2.0 kg a.i /ha after 1 st irrigation and hoeing followed by 2,4 -D @ 1.0kg a.i. /ha at 75 DAP.	78.3	75.0	78.5	77.2
T5= Metribuzin @ 1.25 kg a.i /ha(Pre-e) fb. 2,4 -D @ 1.0kg a.i. /ha at 75 DAP.	80.5	76.3	71.2	79.3
T6= Atrazine @ 2.0 kg a.i /ha(Pre-e)+ Almix @ 20g / ha at 75 DAP.	79.1	75.6	80.6	78.4
T7= Metribuzin @ 1.25 kg a.i /ha (Pre-e)+ Almix 20g / ha at 75 DAP.	86.3	81.9	87.3	85.1
T8= Atrazine @ 2.0 kg a.i/ha (Pre- e)+ Ethoxysulfuron. @ 50g a.i. /ha at 75 DAP.	80.2	76.4	81.5	79.4
T9= Atrazine @ 2.0 kg a.i /ha (Pre-e)+ Dicamba 350g a.i. /ha at 75 DAP.	78.6	74.2	79.8	77.5
T10= Metribuzin @ 1.25 kg a.i /ha (Pre-e)+ Dicamba 350g a.i. /ha at 75DAP.	82.4	78.0	83.0	81.1
S.Em±	1.1	2.0	2.2	1.6
C.D (P=0.05)	3.2	5.1	6.3	4.5
C.V	11.2	9.4	10.4	9.1

- III. V. Project No : AS 64
- VI. Project Title : Response of sugarcane crop to different plant nutrients in varied agro ecological situations.
- VII. Serial number of the year of experimentation : I 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 2011-12 finalized during Biennial workshop of AICRP (Sugarcane) held at Navsari Agricultural University, Navsari, Gujarat from 27th to 29th October, 2010.
- a. Treatments :12
- 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
- S:30 kg/ha- elemental sulphur
- Zn: 50 kg ZnSO₄/ha
- Fe: 25 kg Fe SO₄/ha.
- Mn: 30 kg MnSO₄/ha
- NPK as per recommendation (112kg N + 100kg P₂O₅ + 120kg K₂O / ha)
- b. Design : RBD
- c. Replications : Three
- d. Plot size : 8.0X 8.0 m
- e. Manuring : .As per treatments.
 Entire dose of phosphorous 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 : 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 harvesting : 11.4.2012
- h. Designation and name of the Participants : Dr. T. Chitkala Devi, Senior Scientist (Agronomy)
 Dr.M.B.G.S. Kumari, Scientist (Agronomy)
 Dr. V. Gouri, Scientist (Agronomy)
 Dr. K. Prasada Rao, Principal Scientist (Sugarcane)
- i. Year of trial : I year
- j. Results recorded previously : New trial

k. Data recorded during the year:

Initial soil analysis was done in the experimental plot. The soil is low in organic carbon (0.41%), low in available nitrogen (210 kg N /ha), medium in available phosphorus (32.8 kg/ha), high in available potassium (310 kg / K₂O /ha), low in Sulphur (8.7 ppm), low in Zinc (0.45 ppm), low in Iron (2.9 ppm) and sufficient in Manganese (2.3 ppm).

Percent germination: Percent germination was recorded at 35th DAP (Table – 5) and it varied significantly due to different nutrient treatments. Significantly higher germination percent was recorded with application of NPK (68.5%) or NPK + Zn (68.0%) or NPK + S + Zn + Fe (68.2%) or other micronutrients individually in combination with NP and K or fertilizer applied on soil test basis as compared to application of Nitrogen alone (62.2%). No fertilizer applied plot registered the lowest percent germination (60.2%).

Number of millable canes: Number of millable canes were recorded at harvest and data are presented in Table - 5. Application of NPK + S + Zn + Fe + Mn (78,879 /ha) or soil test based fertilizer application (78,009 /ha) or N,P,K, + S + Zn + Fe (77,965/ha) or NPK + S + Zn (77,761 /ha) or NPK + Fe (77, 419/ha) or NPK + Zn (77,347/ha) or NPK + S (77,008 /ha) found to register higher number of millable canes than other nutrient treatments. No fertilizer applied plot registered the lowest number of millable canes (58,169 /ha).

Juice Sucrose: Juice analysis was done at harvest and the data are presented in Table – 5. All the nutrient applied plots registered significantly higher juice sucrose values than no fertilizer applied plot. Among the treatmental plots application of NPK + S + Zn + Fe registered higher juice sucrose values (18.66%) closely followed by NPK + S + Zn + Fe + Mn (18.47%) than other treatments. No fertilizer applied plot registered the lowest juice sucrose value of 17.53%.

Cane yield (t/ha): Can yield was recorded at harvest and the data are presented in Table – 5. Application of macro nutrients (N,P,K) along with Fe, Zn and also Mn and S registered significantly higher cane yield of 80.1 t/ha as compared to application of N alone (70.2 t/ha) or N and P (73.0 t/ha) or N, P and K (74.7 t/ha) or N,P,K and S (75.2 t/ha) but found on par with application of nutrients based on soil test (79.6 t/ha) and NPK + Zn and Fe (77.8t/ha) or NPK + S + Zn (76.3 t/ha) or NPK + Fe (76.6 t/ha) or NPK + Zn (76.3 t/ha). No fertilizer applied plot registered the lowest cane yield of 60.3 t/ha.

Commercial cane Sugar (%): CCS% varied significantly due to different nutrient treatments. CCS% followed the same trend as that of percent juice sucrose and it ranged from 13.19 to 14.05% in different nutrient applied plots. No fertilizer applied plot registered significantly lower CCS% (12.83%) than all the treatmental plots.

Sugar yield (t/ha): Sugar yield was calculated based on CCS% and cane yield. Sugar yield followed the same trend as that of cane yield and it ranged from 9.2 to 10.8 t/ha in different nutrient applied plots. No fertilizer applied plot registered the lowest sugar yield of 7.7 t/ha.

Summary:

Effect of different macro and micronutrients on sugarcane was studied during 2011-12 season at RARS, Anakapalle. The results of the study indicated that, application of macro nutrients (N,P,K) along with Fe, Zn and also Mn and S registered significantly higher cane yield of 80.1 t/ha as compared to application of N alone (70.2 t/ha) or N and P (73.0 t/ha) or N, P and K (74.7 t/ha) or N,P,K and S (75.2 t/ha) but found on par with application of nutrients based on soil test (79.6 t/ha) and NPK + Zn and Fe (77.8t/ha) or NPK + S + Zn (76.3 t/ha) or NPK + Fe (76.6 t/ha) or NPK + Zn (76.3 t/ha). No fertilizer applied plot registered the lowest cane yield of 60.3 t/ha.

Table: 5 - Percent Germination, Yield attributes, Yield and quality of sugarcane as influenced by different nutrients

Treatments	Percent Germination	NMC /ha	Percent juice sucrose	CCS %	Cane yield (t/ha)	Sugar yield (t/ha)
T1: Control (No Fertilizer)	60.2	58169	17.53	12.83	60.3	7.7
T2: N	62.2	71238	18.00	13.21	70.2	9.3
T3: NP	66.1	73681	18.23	13.50	73.0	9.8
T4: NPK	68.5	75265	18.16	13.52	74.7	10.1
T5: NPK +S	66.0	77008	18.27	13.46	75.2	10.1
T6: NPK + Zn	68.0	77347	18.04	13.21	76.3	10.0
T7: NPK + Fe	66.4	77419	18.09	13.22	76.6	10.1
T8: NPK +Mn	67.0	76213	18.35	13.52	75.7	10.2
T9: NPK + S + Zn	67.5	77761	18.30	13.47	76.3	10.3
T10: NPK + S + Zn +Fe	68.2	77965	18.66	14.05	77.8	10.6
T11: NPK + S + Zn +Fe + Mn	66.5	78879	18.47	13.65	80.1	10.9
T12: Soil test based fertilizer application	64.7	78009	18.30	13.60	79.6	10.8
S.Em \pm	1.8	891	0.09	0.13	1.4	-
C.D. (P=0.05)	5.0	2572	0.27	0.37	4.1	-
C.V (%)	8.2	6.3	9.1	7.5	12.3	-