

**All India Coordinated Research Project on Sugarcane
Zonal Agriculture Research Station (J.N.K Vishwa Vidhyalaya)
Powarkheda- 461 110 (M.P.)**

ZARS/ Sugarcane /2013/58

Dated: 11.07.2013

**To,
Dr. V. P. Singh,
Principal Investigator (Crop Production AICRP on Sugarcane) &
Director Research, Rajendra Agricultural University,
PUSA – 848 125 Distt. Samastipur - BIHAR**

Through: Proper channel

**Sub: Annual Report of AICRP on Sugarcane –Crop Production for the year of
2012-2013**

Sir,

Please find enclosed herewith “Annual Progress Report” of AICRP on Sugarcane- Crop Production, ZARS, Powarkheda (M.P.) for the year 2012-2013. Submitted for your information and necessary action please.

Kindly acknowledge the receipt of the same.

With regards,

Yours faithfully

(O. Toppo)

ZARS/Sugarcane/2013 / 59 to 61

Dated: 11.07.2013

C.C. to,

- 1. Dr. O. K. Sinha, Project Coordinator, AICRP on Sugarcane, Indian Institute of Sugarcane Research, P.O. Dilkusha, LUCKNOW- 225 002 (U. P.)**
- 2. Director Research Services, J.N. Krishi Vishwa Vidyalaya, Adhartal, Jabalpur – 4 (M.P.)**
- 3. Project In charge, AICRP on Sugarcane, ZARS, Powarkheda (M.P.)**

-for information & necessary action please.

(O. Toppo)

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ANNUAL PROGRESS REPORT

2012-2013

CROP PRODUCTION



***ALL INDIA COORDINATED RESEARCH PROJECT
ON SUGARCANE***



**JAWAHARLAL NEHRU KRISHI VISHWA VIDYALAYA
ZONAL AGRICULTURAL RESEARCH STATION
POWARKHEDA – 461 110 (M. P.)**

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**ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE
ZONAL AGRICULTURAL RESEARCH STATION POWARKHEDA – 461 110 (M. P.)
ANNUAL PROGRESS REPORT (2012-13)**

CROP PRODUCTION

Experiment no. 1: AS 42 (A) - Agronomic evaluation of new promising genotypes of sugarcane (early maturity)

Objective: To work out agronomy of early maturing sugarcane genotypes from Advance Varietal Trial (AVT).

Treatment : 9 (3 varieties x 3 fertility levels)

Varieties : Co 0403 Co Snk 3632 Co C 671

Fertilizer levels: 1. 75 per cent recommended dose of N (300:80:60)
2. 100 per cent recommended dose of N (300:80:60)
3. 125 per cent recommended dose of N (300:80:60)

Design: RBD

Replications: 03

Plot Size: 5.4 x 6.0 m² (6 rows at 90 cm row spacing)

Planting date : 04-02-2012

Soil fertility status: Available N – 223 kg/ha, P- 21.7 kg/ha and K – 485 kg/ha

Results:

Germination (%): The germination percentage did not differ significantly. The germination percentage recorded higher with Co 0403(64.84%) than Co C 671(64.79%) and Co Snk 3632 (64.73%). The germination percentage was not influenced by different fertility levels.

Table -1 (AS-42:A):Effect of different fertility levels on growth, yield and quality of early maturing sugarcane genotypes at Powarkheda.

S. No.	Treatments	Germination (%)	Tillers (000'/ha)	Plant Height (cm)	NMC (000'/ha)	Brix (%)	Cane Yield (t/ha)
Genotypes							
1	Co 0403	64.84	90.78	209	86.80	21.38	83.74
2	Co Snk 3632	64.73	99.11	270	96.23	21.33	93.72
3	Co C 671	64.79	94.92	224	89.03	21.86	85.49
	S Em +	1.93	1.82	3.28	1.71	0.17	2.21
	CD at 5%	NS	5.42	9.82	5.13	NS	6.62
Fertilizer dose (% Recommended N)							
1	75%	64.44	90.29	214	86.35	21.48	81.79
2	100%	64.45	96.33	240	91.84	21.53	88.99
3	125%	65.57	98.18	249	93.86	21.56	92.18
	S Em +	1.93	1.82	3.28	1.71	0.17	2.21
	CD at 5%	NS	5.42	9.82	5.13	NS	6.62

Tillers (000'/ha): Among varieties Co Snk 3632 showed significantly higher number of tillers recorded with (99.11) than Co 403 (90.78) . The differences for tillers influenced significantly due to fertility levels. The significantly higher number of tillers recorded with 125% recommended dose of N (98.18) as compared with 75% recommended dose of N (90.29).Both the levels of RDF N (100 and 125%) showed at par tillers but were significantly higher than the 75% RDF N.

Plant Height (cm): Among varieties Co Snk 3632 showed significantly higher plant height (270 cm) as compared to Co C 671 (224 cm) and Co 0403(209 cm). Fertilizer levels showed significant influence on plant height. The maximum plant height (249 cm) recorded with 125% RDF N and the differences were significantly higher than the plant height obtained due to application of 75% RDF N (214 cm). The plant height also increased significantly due to application of 100 % RDF N (240 cm) than 75% RDF N. Both the levels of RDF N(100 and 125%) showed at par plant height but were significantly higher than the 75% RDF N.

Number of Millable Canes (000'/ha): The NMC influenced significantly due to varieties and fertility levels during experimentation. Among varieties the NMC recorded significantly higher with Co Snk 3632 (96.23) as compared to Co C 671 (89.03) and Co 0403 (86.80). The NMC recorded in-between Co C 671 and Co 0403 were at par. The NMC increased with the increase in fertilizer levels. Significantly higher NMC (93.86) recorded with 125% RDF N than 75% RDF N(86.35). The NMC recorded in between 100% RDF N and 75% RDF N and 125% RDF N and 100 RDF N were at par.

Brix (%): The brix values ranged from 21.33 to 21.86 per cent for varieties and 21.48 to 21.56 per cent in fertilizer levels. However, brix values did not differ significantly due to varieties and fertilizer levels.

Cane Yield (t/ha): Among varieties Co Snk 3632 recorded significantly higher cane yield of (93.72 t/ha) than the cane yield obtained with Co C 671 (85.49 t/ha) and Co 0403 (83.74 t/ha) but the cane yield obtained at par in between Co C 671 (85.49 t/ha) and Co 0403 (83.74 t/ha).Application of fertilizer doses increased cane yield correspondingly with the increase in fertilizer levels and significantly higher cane yield (92.18 t/ha) obtained due to application of 125 % RDF N than 75% RDF N (81.79 t/ha). The cane yield obtained at par in-between 100 and 125 % RDF N.

Summary:

Results revealed that among the early genotypes Co Snk 3632 gave significantly higher cane yield of 93.72 t/ha than Co C 671 (85.49 t/ha) and Co 0403(83.74 t/ha). Application of 125 % RDF N gave significantly higher cane yield of (92.18 t/ha) than 75 % RDF N (81.79 t/ha) but increase in cane yield was at par in-between 100 and 125% RDF N.

Expt. No.2. (AS 42 B): Agronomic evaluation of new promising genotypes of sugarcane (Mid late maturity)

Objective: To workout agronomy of sugarcane genotypes from advanced varietal trial (AVT).

Treatments: 09 (3 varieties X 3 fertilizer levels)

Varieties: Co 0214 Co 0409 Co 86032

Fertilizer levels: i. 75% Recommended dose of N
ii. 100% Recommended dose of N
iii. 125% Recommended dose of N

Design: RBD,

Replication: 03

Plot size: 5.4 X 6.0 m² (6 rows at 90 cm row spacing)

Planting date: 07.02.2012

Soil Fertility Status: Available N – 223 kg/ha, P – 21.7 kg/ha, K – 485 kg/ha

Results:

Germination (%): The germination percentage did not differ significantly due to varieties or fertility levels. However, germination percentage ranged from 70.46 to 70.57 percent for varieties and 70.17 to 70.01 percent for fertility levels .

Tillers (000'/ha): Among varieties Co 0214 recorded higher numbers of tillers (97.09) than Co 0409 (86.52) . Application of fertilizer levels recorded higher number of tillers. Significantly higher number of tillers obtained at 100% RDF N (93.21) and 125% RDF N (95.99) as compared to number of tillers recorded with 75% RDF N (84.47). Number of tillers recorded at par in between 100 and 125% recommended dose of N.

Table 2: (AS 42 B): Effect of different fertility levels on growth yield and quality of late maturing sugarcane genotypes at Powarkheda

S. No	Treatments	Germination (%)	Tillers (000'/ha)	Plant Height (cm)	NMC (000'/ha)	Brix (%)	Cane Yield (t/ha)
Genotypes							
1	Co 0214	70.46	97.09	263	90.09	21.36	97.29
2	Co 0409	70.57	86.52	216	82.00	21.40	86.97
3	Co 86032	70.46	90.05	233	86.15	21.44	88.65
	S Em +	0.34	2.68	3.27	2.38	0.21	2.38
	CD at 5%	NS	8.04	9.80	7.14	NS	7.12
Fertilizer dose (% Recommended N)							
1	75%	70.31	84.47	221	78.94	21.29	85.32
2	100%	70.01	93.21	244	88.48	21.42	92.18
3	125%	70.17	95.99	248	90.81	21.48	95.40
	S Em +	0.34	2.68	3.27	2.38	0.21	2.38
	CD at 5%	NS	8.04	9.80	7.14	NS	7.12

Plant height (cm): Among varieties Co 0214 showed significantly higher plant height (263 cm) as compared to Co 86032 (233 cm) and Co 409 (216 cm). Fertilizer levels showed significant influence in plant height . Application of fertilizer levels increased plant height significantly and recorded higher plant height (248 cm) due to application of 125% RDF N than 75% RDF N (221 cm). The plant height recorded at par in between 100 and 125% recommended dose of N.

Number of Millable Canes (NMC '000'/ha): Among varieties the NMC population recorded significantly higher with Co 0214 (90.09) as compared to Co 0409(82.00).The NMC values recorded in between Co 86032 (86.15) and Co 0409 (82.00) were at par . The NMC increased significantly due to application of fertilizer levels . Significantly higher NMC (90.81) recorded with 125% RDF N than 75% RDF N (78.94). The NMC values recorded with 100 and 125% RDF N was at par.

Brix (%): The brix values did not differ significantly either due to varieties or fertility levels. However, among varieties the brix value ranged from 21.36 to 21.44 for varieties and 21.29 to 21.48 per cent for fertility levels.

Cane yield (t/ha): The cane yield was influenced significantly due to different varieties. However, among varieties Co 0214 recorded significantly higher cane yield of (97.29 t/ha) than the Co 86032 (88.65 t/ha) and Co 0409 (86.97 t/ha). The cane

yield recorded at par in between Co 86032 (88.65 t/ha) and Co 0409 (86.97 t/ha). Application of fertilizer doses increased cane yield with the increase in fertilizer levels. The cane yield significantly higher with 125% RDF N (95.40 t/ha). than 75% RDF N (85.32 t/ha). The cane yield recorded with 100 and 125% RDF N was at par.

Summary: Results revealed that among the mid late genotypes Co 0214 gave significantly higher cane yield of (97.29 t/ha) than Co 86032 (88.65 t/ha) and Co 0409 (86.97 t/ha). Application of 125 % RDF N gave significantly higher cane yield of(95.40 t/ha) than 75 % RDF N (85.32 t/ha) but increase in cane yield was at par in-between 100 and 125% RDF N.

Experiment no. 3: AS 42 (A) - Agronomic evaluation of new promising genotypes of Ratoon sugarcane (early maturity)

Objective: To work out agronomy of early maturing ratoon sugarcane genotypes from Advance Varietal Trial (AVT).

Treatment : 9 (3 varieties x 3 fertility levels)

Varieties : Co 0403 Co Snk 3632 Co C 671

Fertilizer levels: 1. 75 per cent recommended dose of NPK (300:80:60)
2. 100 per cent recommended dose of NPK (300:80:60)
3. 125 per cent recommended dose of NPK (300:80:60)

Design: RBD **Replications:** 3

Plot Size: 5.4 x 6.0 m² (6 rows at 90 cm row spacing)

Soil fertility status: Available N – 223 kg/ha, P- 21.7 kg/ha and K – 485 kg/ha

Results:

Tillers (000'/ha): Among varieties Co Snk 3632 showed significantly higher number of tillers recorded with (79.15) than Co 403 (71.88). The number of tillers recorded in-between Co C 671 and Co Snk 3632 were at par . The differences for tillers influenced significantly due to fertility levels. The significantly higher number of tillers recorded with 125% recommended dose of NPK (79.56) as compared with 75% recommended dose of NPK(70.01).Both the levels of RDF NPK (100 and 125%) showed at par tillers but were significantly higher than the 75% RDF NPK.

Table -1 (AS-42:AEffect of different fertility levels on growth, yield and quality of early maturing ratoon sugarcane genotypes at Powarkheda.

S. No.	Treatments	Tillers (000'/ha)	Plant Height (cm)	NMC (000'/ha)	Brix (%)	Cane Yield (t/ha)
Genotypes						
1	Co 0403	71.88	213	73.94	21.46	58.88
2	Co Snk 3632	79.15	256	84.05	21.33	62.52
3	Co C 671	76.23	224	75.82	21.87	59.29
	S Em +	2.35	2.84	2.37	0.19	2.37
	CD at 5%	7.04	8.52	7.11	NS	7.09
Fertilizer dose (% Recommended NPK)						
1	75%	70.01	218	72.63	21.56	55.73
2	100%	77.19	236	79.56	21.53	61.52
3	125%	79.56	240	81.62	21.57	63.44
	S Em +	2.35	2.84	2.37	0.19	2.37
	CD at 5%	7.04	8.52	7.11	NS	7.09

Plant Height (cm): Among varieties Co Snk 3632 showed significantly higher plant height (256 cm) as compared to Co C 671 (224 cm) and Co 0403(213 cm). Fertilizer levels showed significant influence on plant height. The maximum plant height (240 cm) recorded with 125% RDF NPK and the differences were significantly higher than the plant height obtained due to application of 75% RDF NPK (218 cm). The plant height also increased significantly due to application of 100 % RDF NPK (236 cm) than 75% RDF NPK. Both the levels of RDF NPK(100 and 125%) showed at par plant height but were significantly higher than the 75% RDF NPK.

Number of Millable Canes (000'/ha): The NMC was influenced significantly due to varieties and fertility levels during experimentation. Among varieties, Co Snk 3632 (84.05) recorded significantly higher NMC as compared to Co C 671 (75.82) and Co 0403 (73.94). The NMC recorded in-between Co C 671 and Co 0403 were at par. The NMC increased with the increase in fertilizer levels. Significantly higher NMC (81.62) recorded with 125% RDF NPK than 75% RDF NPK (72.63). The NMC recorded in between 100% RDF NPK and 75% RDF NPK and 125% RDF NPK and 100 RDF NPK were at par.

Brix (%): The brix values ranged from 21.33 to 21.87 per cent for varieties and 21.53 to 21.57 per cent in fertilizer levels. However, brix values did not differ significantly due to varieties and fertilizer levels.

Cane Yield (t/ha): Varieties did not differ significantly, however Co Snk 3632 recorded higher cane yield of (62.52 t/ha) than the cane yield obtained with Co C 671 (59.29 t/ha) and Co 0403 (58.88 t/ha). Application of fertilizer doses increased cane yield correspondingly with the increase in fertilizer levels and significantly higher cane yield (63.44 t/ha) obtained due to application of 125 % RDF NPK than 75% RDF NPK (55.73 t/ha). The cane yield obtained at par in-between 100 and 125 % RDF NPK.

Summary:

Results revealed that among varieties did not differ significantly . The early genotypes Co Snk 3632 gave higher cane yield of (62.52 t/ha) than Co C 671 (59.29 t/ha) and Co 0403(58.88 t/ha). Application of 125 % RDF NPK gave significantly higher cane yield of(63.44t/ha) than 75 % RDF N (55.73 t/ha) but increase in cane yield was at par in-between 100 and 125% RDF NPK.

Expt. No.4. (AS 42 B): Agronomic evaluation of new promising genotypes of Ratoon sugarcane (Mid late maturity)

Objective: To workout agronomy of ratoon sugarcane genotypes from advanced varietal trial (AVT).

Treatments: 09 (3 varieties X 3 fertilizer levels)

Varieties: Co 0214 Co 0409 Co 86032

Fertilizer levels: i. 75% Recommended dose of NPK
ii. 100% Recommended dose of NPK
iii. 125% Recommended dose of NPK

Design: RBD,

Replication: 03

Plot size: 5.4 X 6.0 m² (6 rows at 90 cm row spacing)

Soil Fertility Status: Available N – 223 kg/ha, P – 21.7 kg/ha, K – 485 kg/ha

Results:

Tillers (000'/ha): Varieties Co 0214 recorded significantly higher numbers of tillers (76.51) than Co 0409 (66.94) . Application of fertilizer levels showed higher number of tillers but did not differ significantly. Number of tillers obtained at 100% RDF NPK (72.26) and 125% RDF NPK (73.90) as compared to number of tillers recorded with 75% RDF NPK (65.29).

Table 2: (AS 42 B): Effect of different fertility levels on growth yield and quality of late maturing Ratoon sugarcane genotypes at Powarkheda

S. No	Treatments	Tillers (000'/ha)	Plant Height (cm)	NMC (000'/ha)	Brix (%)	Cane Yield (t/ha)
Genotypes						
1	Co 0214	76.51	250	70.95	21.38	77.74
2	Co 0409	66.94	201	60.91	21.37	67.18
3	Co 86032	68.00	216	68.19	21.71	68.69
	S Em +	3.06	3.54	2.94	0.20	2.40
	CD at 5%	9.17	10.61	8.80	NS	7.42
Fertilizer dose (% Recommended NPK)						
1	75%	65.29	206	61.04	21.47	65.71
2	100%	72.26	229	67.73	21.57	72.22
3	125%	73.90	231	70.27	21.42	75.69
	S Em +	3.06	3.54	2.94	0.20	2.40
	CD at 5%	9.17	10.61	8.80	NS	7.42

Plant height (cm): Among varieties Co 0214 showed significantly higher plant height (250 cm) as compared to Co 86032 (216 cm) and Co 409 (201 cm). Fertilizer levels showed significant influence in plant height. Application of fertilizer levels increased plant height significantly (231 cm) due to application of 125% RDF NPK than 75% RDF NPK (206 cm). The plant height recorded at par in between 100 and 125% recommended dose of NPK.

Number of Millable Canes (NMC '000'/ha): Among varieties the NMC population recorded significantly higher with Co 0214 (70.95) as compared to Co 0409 (60.91). The NMC values recorded in between Co 86032 (68.19) and Co 0214 (70.95) were at par. The NMC increased significantly due to application of fertilizer levels. Significantly higher NMC (70.27) recorded with 125% RDF NPK than 75% RDF NPK (61.04). The NMC values recorded with 100 and 125% RDF NPK were at par.

Brix (%): The brix values did not differ significantly either due to varieties or fertility levels. However, among varieties the brix value ranged from 21.38 to 21.71 for varieties and 21.42 to 21.57 per cent for fertility levels.

Cane yield (t/ha): The cane yield was influenced significantly due to different varieties. However, among varieties Co 0214 recorded significantly higher cane yield

of (77.74 t/ha) than the Co 86032 (68.69 t/ha) and Co 0409 (67.18 t/ha). The cane yield recorded at par in between Co 86032 (68.69 t/ha) and Co 0409 (67.18 t/ha). Application of fertilizer doses increased cane yield with the increase in fertilizer levels. The cane yield significantly higher with 125% RDF NPK (75.69 t/ha). than 75% RDF NPK (65.71 t/ha). The cane yield recorded with 100 and 125% RDF NPK was at par.

Summary: Results revealed that among the mid late genotypes Co 0214 gave significantly higher cane yield of (77.74 t/ha) than Co 86032 (68.69 t/ha) and Co 0409 (67.18 t/ha). Application of 125 % RDF NPK gave significantly higher cane yield of (75.69 t/ha) than 75 % RDF NPK (65.71 t/ha) but increase in cane yield was at par in between 100 and 125% RDF NPK.

Expt. No. 4 (AS- 64): Response of sugarcane crop to different plant nutrients in varied agro-ecological situations

Objective: To study differential response of sugarcane crop to different nutrients.

Treatments: 13

1.	Control (no fertilizer)	8.	NPK+ Mn
2.	N	9.	NPK+S+Zn
3.	NP	10.	NPK+ S+Zn+Fe
4.	NPK	11.	NPK+S+Zn+Fe+Mn
5.	NPK+S	12.	Soil test based fertilizer application
6.	NPK+Zn	13.	FYM @ 20 t/ha
7.	NPK+ Fe		

RDF - 300:80:60 NPK/ha Design: RBD Replications: 03

Plot size: 5.4 X 8 m² (6 rows at 90 cm spacing)

Planting date: 24.01.2012 Variety: Co JN 86 – 600

Soil Fertility status:

S.No.	Properties	Value
1.	Available N	226 kg/ha
2.	Available P ₂ O ₅	22.2 kg/ha
3.	Available K ₂ O	495 kg/ha
4.	S	16 kg/ha
5.	Zn	0.61 ppm
6.	Fe	8.7
7.	pH	7.8
8.	EC	0.17mmhos/cm
9.	OC (%)	0.49 %
10.	Soil Texture	Clay loam (deep black soils)

Results:

Germination (%): The germination percentage was not influenced due to various treatments during experimentation. However, germination per cent ranged between 67.52 to 68.75 per cent among treatments.

Tillers (000'/ha): The number of tillers increased significantly due to application of all plant nutrients and there was beneficial effect observed in increasing the number of tillers either with the application of the alone plant nutrients or in combination with major plant nutrients. The number of tillers increased significantly due to application of N alone (93.75), NP (102.70), NPK (107.79), FYM (91.67) and highest number of tillers recorded in NPK+S+Zn+Fe+Mn (108.33) than control plot (81.02). However, number of tillers values recorded in combination of NP and other micro nutrients was at par.

Plant height (cm): The plant height increased significantly due to application of all plant nutrient treatments than control (225 cm). The significant increase in plant height was more apparent due to application of N alone (264 cm), NP (267 cm), FYM (266 cm) than control plots (225 cm) and plant height recorded at par among all plant nutrient treatments.

Number of millable canes (NMC 000'/ha): the NMC influenced significantly due to application of nutrients either alone or in combination with NPK. Significantly higher NMC values recorded at N alone (86.88), NP (96.22), NPK (105.63) than control (68.67). The application of NPK showed significantly higher values of NMC than the application of N, NP and FYM but was at par in between an N and FYM. Application of micronutrients with NPK although showed higher values of NMC but increase in NMC was not reached up to the level of significance.

Brix (%): The value of brix per cent did not differ significantly due to various treatments during experimentation. The brix percentage ranged between 20.94 to 21.25 per cent.

Cane Yield (t/ha): The cane yield increased significantly due to application of plant nutrients either alone or in combination with NPK. The increase in cane yield was more promised and recorded higher with application of N alone (76.62 t/ha), NP (86.65 t/ha), NPK (91.67 t/ha) and FYM (73.38 t/ha) than control (50.93 t/ha). Application of all micronutrients with NPK although showed increase in cane yield but increase in yield was not reached up to the level of significance.

Table 5.(AS-64): Effect of different treatments on growth, yield and quality of sugarcane.

S.No.	Treatments	Germination (%)	Tillers (000'/ha)	Height (cm)	NMC (000'/ha)	Brix (%)	Yield (t/ha)
1	Control	67.98	81.02	225	68.67	21.13	50.93
2	N	67.52	93.75	264	86.88	21.24	76.62
3	NP	68.60	102.70	267	96.22	21.24	86.65
4	NPK	68.52	107.79	297	105.63	21.24	91.67
5	NPK+S	67.67	107.87	297	106.56	21.25	95.52
6	NPK+Zn	68.29	107.64	297	105.71	21.24	96.84
7	NPK+Fe	68.36	107.79	297	105.79	20.94	96.37
8	NPK+Mn	67.82	108.02	296	105.71	21.23	95.99
9	NPK+S+Zn	67.59	108.10	297	108.02	21.23	97.38
10	NPK+S+Zn+Fe	68.75	108.10	296	107.56	21.22	97.69
11	NPK+S+Zn+Fe+Mn	67.59	108.33	297	107.56	21.22	97.53
12	Soil test based	68.29	107.41	296	105.40	21.22	93.36
13	FYM @ 20 t/ha	68.13	91.67	266	84.10	21.22	73.38
S Em ±		0.32	2.45	3.18	2.66	0.08	2.43
CD at 5%		NS	7.14	9.26	7.74	NS	7.07

Summary: The cane yield and yield attributes increased significantly due to application of major plant nutrients viz. N, NP and NPK than control (without fertilizers). Application of micronutrients with NPK although showed beneficial effects on crop growth and yield of the crop but increase in cane yield was not reached up to the level of significance.

Expt. No. 6 (AS- 66): Priming of cane node for accelerating germination.

Objective: (1) To find out suitable cane node priming technique.

(2) To assess the effect of cane node on acceleration of germination.

Treatments: 06

T1: Un-primed cane node

T2: Treating cane node in hot water at 50 C for 2 hr.

T3: Treat. cane node in hot water 50 C urea solution 3% for 2 hr.

T4: priming cane node with cattle dung, cattle urine & water in 1:2:5 ratio

T5: Conventional 3 bud sett planting

T6: primed & sprouted cane node (Incubated for 4 days after priming)

RDF - 300:80:60 NPK/ha Design: RBD Replications: 04

Plot size: 4.5 X 6 m² (5 rows at 90 cm spacing)

Planting date: 24.01.2012 **Variety:** Co JN 86 – 600

Result:

Germination (%): The germination percentage was influenced significantly due to various treatments during experimentation. However, germination per cent was recorded significantly higher (70.31) in priming cane node with cattle dung, cattle urine & water in 1:2:5 ratio treatment as compared to cane node in hot water 50 C urea solution 3% for 2 hr.(63.67), primed & sprouted cane node (Incubated for 4 days after priming (62.34), treating cane node in hot water at 50 C for 2 hr.(61.80), Conventional 3 bud sett planting(60.63), Un-primed cane node (58.13).but increase in germination per cent were at par in between these (T1, T2, T3, T5 and T6) treatments.

Tillers (000'/ha): The number of tillers increased significantly due to treatment of priming cane node with cattle dung, cattle urine & water in 1:2:5 ratio (99.17) as compared to cane node in hot water 50 C urea solution 3% for 2 hr.(90.65), primed & sprouted cane node (Incubated for 4 days after priming (90.46), treating cane node in hot water at 50 C for 2 hr.(88.70), Conventional 3 bud sett planting(87.04), Un-primed cane node (85.19). but increase in tillers were at par in between these (T1, T2, T3, T5 and T6) treatments. all treatments and there was beneficial effect observed in increasing the number of tillers either with the treatments of the Un-primed cane node.

Plant height (cm): The plant height increased significantly due to treatment of priming cane node with cattle dung, cattle urine & water in 1:2:5 ratio (265 cm) as compared to cane node in hot water 50 C urea solution 3% for 2 hr.(255 cm), primed & sprouted cane node (Incubated for 4 days after priming (252 cm), treating cane node in hot water at 50 C for 2 hr.(250 cm), Conventional 3 bud sett planting(249 cm), Un-primed cane node (248 cm). but increase in height were at par in between these (T1, T2, T3, T5 and T6) treatments.

Number of millable canes (NMC 000'/ha): The NMC influenced significantly due to treatment. Significantly higher NMC values recorded of priming cane node with cattle

dung, cattle urine & water in 1:2:5 ratio (93.61) as compared to cane node in hot water 50 C urea solution 3% for 2 hr.(85.09), primed & sprouted cane node (Incubated for 4 days after priming (84.91), treating cane node in hot water at 50 C for 2 hr.(83.15), Conventional 3 bud sett planting(81.39), Un-primed cane node (79.63). But increase in NMC were at par in between these (T1, T2, T3, T5 and T6) treatments.

Brix (%): The value of brix per cent did not differ significantly due to various treatments during experimentation. The brix percentage ranged between 21.25 to 21.33 per cent.

Cane Yield (t/ha): The cane yield increased significantly due to treatment of priming cane node with cattle dung, cattle urine & water in 1:2:5 ratio (91.67 t/ha) as compared to cane node in hot water 50 C urea solution 3% for 2 hr.(83.33 t/ha), primed & sprouted cane node (Incubated for 4 days after priming (83.06 t/ha), treating cane node in hot water at 50 C for 2 hr.(81.30 t/ha), Conventional 3 bud sett planting(79.44 t/ha), Un-primed cane node (77.78 t/ha). but increase in cane yield were at par in between these (T1, T2, T3, T5 and T6) treatments.

Table 6.(AS-66): Effect of different treatments on germination growth, yield and quality of sugarcane.

S.No.	Treatments	Germination (%)	Tillers (000'/ha)	Height (cm)	NMC (000'/ha)	Brix (%)	Yield (t/ha)
1	Un-primed cane node	58.13	85.19	248	79.63	21.28	77.78
2	Treating cane node in hot water at 50 C for 2 hr.	61.80	88.70	250	83.15	21.28	81.30
3	Treat. cane node in hot water 50 C urea solution 3% for 2 hr.	63.67	90.65	255	85.09	21.25	83.33
4	priming cane node with cattle dung, cattle urine & water in 1:2:5 ratio	70.31	99.17	265	93.61	21.26	91.67
5	Conventional 3 bud sett planting	60.63	87.04	249	81.39	21.33	79.44
6	primed & sprouted cane node (Incubated for 4 days after priming	62.34	90.46	252	84.91	21.33	83.06
S Em ±		2.00	2.45	2.09	2.43	0.02	2.4
CD at 5%		6.03	7.37	6.29	7.33	NS	7.23

Summary: The germination percentage, cane yield and yield attributes increased significantly due to treatment of priming cane node with cattle dung, cattle urine & water in 1:2:5 ratio(70.31%) than other treatments. But treatments of cane node in hot water 50 C urea solution 3% for 2 hr.(63.67%), primed & sprouted cane node (Incubated for 4 days after priming (62.34%), treating cane node in hot water at 50 C for 2 hr.(61.80%), Conventional 3 bud sett planting (60.63%), Un-primed cane node (58.13%), although showed beneficial effects on germination per cent crop growth and yield of the crop but increase in germination percentage was not reached up to the level of significance.

Expt. No. 7 (AS- 65): Enhancing Sugarcane productivity and profitability under wheat-Sugarcane cropping system.

Objective: (1) To enhance the Sugarcane productivity of Sugarcane under wheat - Sugarcane cropping system.

Treatments: 09

T1 : Autumn planted Sugarcane
T2: T1 + Wheat (1:2)
T3: T1 + Wheat (1:3)
T4: Wheat sown on 15 th Nov. -late Sugarcane
T5: Wheat sown on 15 th Dec. -late Sugarcane
T6: FIRB Sowing of Wheat 15 th Nov.(75 cm with 3 rows of wheat)+ S. in furrow in 3 rd week of Feb.)
T7: FIRB Sowing of Wheat 15 th Nov.(75 cm with 3 rows of wheat)+ S. in furrow in 3 rd week of March.)
T8: T6 with 15 th Dec. sowing of wheat
T9: T7 with 15 th Dec. sowing of wheat

Design: RBD **Replication:** 03 **Plot size:** 5.4 X 8 m² (6 rows at 90 cm spacing)

Date of Planting : As per treatments

Variety : Sugarcane (Co 99004), wheat (MP-1215)

Recommended dose of fertilizer: Sugarcane: NPK (300:80:60 kg/ ha)

Wheat: As per area occupied by the crop.

Date of intercrop harvesting: Last week of April 2013.

Results:

The results showed that the Sugarcane equivalent yield increased significantly higher in intercropping systems except autumn planted Sugarcane + Wheat (1:2) and autumn planted Sugarcane + Wheat (1:3) than sole Sugarcane cropping system. The significantly highest Sugarcane equivalent yield (100.56 t/ha) obtain with autumn planted Sugarcane + Wheat (1:2) followed by autumn planted Sugarcane + Wheat (1:3) (98.75 t/ha) intercropping systems. Among these treatment the equivalent yield recorded at par. Treatment T4,T5,T7 and T9 yield reduced due to late planting of Sugarcane. The highest net return (Rs.51041/ha) and B:C ratio(1:1.29) was recorded under autumn planted Sugarcane + Wheat (1:2) intercropping systems followed by autumn planted Sugarcane + Wheat (1:3) (Rs.45955/ha.),Net return and(1: 1.26) B : C ratio intercropping system. The percent increase (11.30%) in sugarcane equivalent yield was also obtained higher with autumn planted Sugarcane + Wheat (1:2) intercropping system followed by autumn planted Sugarcane + Wheat (1:3) (9.29 %) intercropping system then sole sugarcane cropping system.

Table : 1 Effect of Sugarcane productivity and profitability under wheat-Sugarcane cropping system at Powarkheda.

Treatments	Yield main crop (t / ha)	Yield Intercrop (t / ha)	Sugarcane equivalent yield (t/ ha)	Grass Monitory return (Rs./ ha)	Cost cultivation (Rs/ha)	Net Return (Rs /ha)	B : C Ratio	Increasing equivalent yield (%)
T ₁ : Autumn planted Sugarcane	90.35	-	90.35	198770	162169	36601	1.22	-
T ₂ : T ₁ + Wheat (1:2)	89.97	1.81	100.56	221232	170191	51041	1.29	11.30
T ₃ : T ₁ + Wheat (1:3)	86.81	2.04	98.75	217250	171295	45955	1.26	9.29
T ₄ : Wheat sown on 15 th Nov. -late Sugarcane	63.81	2.01	75.53	166166	171295	-5129	0.97	-16.40
T ₅ : Wheat sown on 15 th Dec. -late Sugarcane	60.49	2.04	72.44	159368	171295	-11927	0.93	-19.82
T ₆ : FIRB Sowing of Wheat 15 th Nov.(75 cm with 3 rows of wheat)+ S. in furrow in 3 rd week of Feb.)	81.94	2.28	95.24	209528	171380	38148	1.22	5.41
T ₇ : FIRB Sowing of Wheat 15 th Nov.(75 cm with 3 rows of wheat)+ S. in furrow in 3 rd week of March.)	75.15	2.35	88.90	195580	171380	24200	1.14	-1.60
T ₈ : T ₆ with 15 th Dec. sowing of wheat	80.48	2.20	93.32	205304	171380	33924	1.19	3.28
T ₉ : T ₇ with 15 th Dec. sowing of wheat	76.16	2.28	89.39	196658	171380	25278	1.14	-1.06
SEm +			1.87					
CD at 5 %			5.60					

Note : Sale price per quintal considered for sugarcane @ Rs. 220 /-, Wheat @ Rs. 1285/- and cost of inputs as per prevailing rates with market.