AGRONOMY

There were six experiments at Faridkot during 2013-14 as listed and discussed below:

1. Experiment (AS 42): Agronomical evaluation of promising new sugarcane genotypes
   A. Early Genotypes
   B. Midlate genotypes
2. Experiment (AS 63): Plant geometry in relation to mechanization in sugarcane
3. Experiment (AS 64): Response of sugarcane to different plant nutrients in varied agro ecological situations
4. Experiment (AS 65): Enhancing sugarcane productivity and profitability under wheat-sugarcane cropping system
5. Experiment (AS 66): Priming of cane node for accelerating germination
6. Experiment (AS67)*: Optimization of fertigation schedule for sugarcane through micro irrigation technique under different agro-climatic conditions (*with modified treatments)

EXPERIMENT WISE RESULTS

Project No. : AS 42

Title: Agronomical evaluation of promising new sugarcane genotypes

Objectives: To work out agronomy of sugarcane genotypes of advanced varietal trials.

This experiment was started in 2012-13 with new set of early and midlate genotypes. First plant crop was taken in 2012-13 and its ratoon was kept during 2013-14 and second plant was also taken in 2013-14. This experiment has been completed with two plants and one ratoon crop.

II Plant crop 2013-14

A. Early group

Treatments:

- Genotypes: 3
  (CoPb 09181, CoPb 08211 and CoPb 08212)
- Fertilizer levels (kg N/ha): 3
  (N_1: 112.5; N_2: 150.0 and N_3: 187.5)

Design: Factorial RBD, Replications: Three, Date of Planting: 07.03.2013
Initial Soil Status: Sandy Loam, pH: 8.1, EC: 0.32 m mhos/cm, OC: 0.35%
P_2O_5: 12.5 kg per ha, K_2O: 622.5 kg per ha

Results

Genotypes

CoPb 09181 was significantly better in cane yield (128.9 t/ha) and cane weight (1823g) than both the genotypes (Table 1a). Number of millable cane was the highest in CoPb 08212 followed by CoPb 09181. Sucrose % was at better in CoPb 08211 than both the genotypes.

N Levels

There was increase in cane yield upto 125% recommended N but statistically significant increase was there with 100% recommended N.

B. Midlate Group

Title: Agronomical evaluation of promising new sugarcane genotypes
Objectives: To work out agronomy of sugarcane genotypes of advanced varietal trials.
Treatments:

- Genotypes: 3
  (CoPb 08217, CoH 08263 and CoH 08264)
- Fertilizer levels (kg N/ha): 3
  (N_1: 112.5; N_2: 150.0 and N_3: 187.5)

Design: Factorial RBD, Replications: Three, Date of Planting: 07.03.2013
Initial Soil Status: Sandy Loam, pH: 8.1, EC: 0.32 m mhos/cm, OC: 0.35%
P_2O_5: 12.5 kg per ha, K_2O: 622.5 kg per ha

Results
Genotypes

CoH 08263 was significantly better in cane yield (124.6 t/ha) than CoPb 08217 (111.6 t/ha) and was at par with CoH 08264 (121.3 t/ha). Sucrose % was the highest in CoPb 08264 followed by CoH 08217 (Table 1b).

N Levels

There was increase in number of millable canes and cane yield upto 125% recommended N but statistically significant increase was there with 100% recommended N.

Conclusion

In early genotypes CoPb 09181 was promising in cane yield. In midlate group CoH 08264 and CoH 08263 were better in cane yield.The response to N fertilizer was upto 100% recommended dose.

Table 1a: Agronomical evaluation of promising sugarcane genotypes (Early) at Faridkot during 2013-14

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	Sucrose (%)
Genotypes								
CoPb 09181	32.5	146.2	112.8	275	2.86	1823	128.9	14.72
CoPb 08211	28.8	133.6	88.3	249	2.71	1057	70.6	17.11
CoPb 08212	36.5	168.7	133.4	291	2.39	1198	94.3	15.87
CD (5%)	2.1	13.0	16.9	16	0.24	283	11.4	0.85
N levels (kg N/ha)								
112.5	32.1	140.9	102.7	262	2.59	1267	89.2	15.61
150.0	32.3	150.2	112.7	272	2.69	1395	101.2	15.91
187.5	33.3	157.4	119.1	281	2.67	1416	103.4	16.19
CD (5%)	NS	13.0	NS	NS	NS	NS	11.4	NS

Table 1b: Agronomical evaluation of promising sugarcane genotypes (Midlate) at Faridkot during 2013-14

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	Sucrose (%)
Genotypes								
CoPb 08217	32.0	159.8	106.8	262	2.60	1354	111.6	13.86
CoH 08263	29.0	161.0	113.6	240	2.85	1357	124.6	13.18
CoH 08264	29.0	147.0	98.7	233	2.82	1432	121.3	14.98
CD (5%)	NS	NS	8.7	17	0.18	NS	9.7	0.64
N levels (kg N/ha)								
112.5	29.8	150.6	95.7	240	2.64	1282	108.9	13.77
150.0	30.7	155.1	110.8	243	2.76	1417	123.7	14.08
187.5	29.5	162.2	112.7	253	2.86	1444	124.8	14.16
CD (5%)	NS	NS	8.7	NS	NS	NS	9.7	NS

Ratoon crop (2013-14)

A. Early group

Treatments:

- Genotypes: 3

  (CoPb 09181, CoPb 08211 and CoPb 08212)

- Fertilizer levels (kg N/ha): 3

  (N_1: 168.75; N_2: 225.0 and N_3: 281.25)

Design: Factorial RBD, Replications: Three

Date of Planting: 15.02.2012 Date of ratooning: 10.02.2013

Results

Genotypes

CoPb 09181 was significantly better in cane yield (76.3 t/ha) than both the genotypes (Table 1c). Number of millable cane was the highest in CoPb 08212 followed by CoPb 09181. Sucrose % was at better in CoPb 08212 than both the genotypes.

N Levels

There was increase in cane yield and millable canes upto 125% recommended N but statistically significant increase was there with 100% recommended N.

Table 1c: Agronomical evaluation of promising sugarcane genotypes (Early) at Faridkot during 2013-14 (Ratoon)

Treatments	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	Sucrose (%)
Genotypes							
CoPb 09181	159.9	90.6	181	2.83	873	76.3	16.42
CoPb 08211	115.6	72.3	139	2.76	878	55.0	17.52
CoPb 08212	199.4	98.0	195	2.55	838	69.7	18.16
CD (5%)	24.7	8.2	34	NS	NS	3.1	NS
N levels (kg N/ha)							
112.5	149.5	79.9	164	2.68	814	60.6	16.99
150.0	158.5	89.2	171	2.73	872	69.2	17.49
187.5	166.9	91.7	180	2.73	903	71.2	17.61
CD (5%)	NS	8.2	NS	NS	NS	3.1	NS

B. Midlate Group

Treatments

- Genotypes: 3

  (CoPb 08217, CoH 08263 and CoH 08264)

- Fertilizer levels (kg N/ha): 3

  (N_1: 168.75; N_2: 225.0 and N_3: 281.25)

Design: Factorial RBD, Replications: Three

Date of Planting: 15.02.2012 Date of ratooning: 11.02.2013

Results

Genotypes

CoH 08263 was significantly better in cane yield (81.5 t/ha) than CoPb 08217 (61.4 t/ha) and CoH 08264 (59.3 t/ha). Sucrose % was the highest in CoPb 08264 followed by CoH 08217 (Table 1d).

N Levels

There was increase in number of millable canes and cane yield upto 125% recommended N but statistically significant increase was there with 100% recommended N.

Conclusion

For ratoon crop, early genotypes CoPb 09181 was promising in cane yield. In midlate group CoH 08264 and CoH 08263 were better in cane yield. The response to N fertilizer was upto 100% recommended dose.

Table 1d: Agronomical evaluation of promising sugarcane genotypes (Midlate) at Faridkot during 2013-14 (Ratoon)

Treatments	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	Sucrose (%)
Genotypes							
CoPb 08217	167.6	95.0	194	2.77	1040	61.4	15.48
CoH 08263	186.0	115.4	184	2.96	1217	81.5	14.83
CoH 08264	121.5	78.9	157	3.05	1092	59.3	16.80
CD (5%)	13.6	10.3	15	0.14	66	9.7	1.02
N levels (kg N/ha)							
112.5	152.0	89.1	175	2.88	1064	59.6	15.13
150.0	160.2	98.2	177	2.95	1136	70.3	16.02
187.5	162.9	102.0	182	2.95	1150	72.2	15.95
CD (5%)	NS	10.3	NS	NS	66	9.7	NS

Summary of results on the basis of two plant crops (2012-13 and 2013-14) and one ratoon 2013-14:
Early Group: On the basis of two plant crops CoPb 09181 was found promising in cane yield among the early group of varieties (Table 1 e). The ratoon yield of CoPb 09181 is significantly better than other genotypes. Although sucrose% of CoPb 09181 was less than other genotypes in plant crop but it was at par in ratoon crop.
Midlate Group: CoH 08263 performed well on the basis of two plants and one ratoon in cane yield (Table 1f). In case of sucrose% CoH 08264 was better than other genotypes on the basis of two plants and one ratoon.

Table 1e: Cane yield (t/ha) and sucrose% of early maturing sugarcane genotypes in Plant I – Ratoon – Plant II cycle.

Treatments	Cane Yield (t/ha)				Sucrose %			
	Plant I (2012-13)	Plant II (2013-14)	Mean	Ratoon (2013-14)	Plant I (2012-13)	Plant II (2013-14)	Mean	Ratoon (2013-14)
Genotypes								
CoPb 0918	105.1	128.9	117.0	76.3	16.69	14.72	15.7	16.42
CoPb 0821	61.6	70.6	66.1	55.0	19.56	17.11	18.3	17.52
CoPb 0821	88.5	94.3	91.4	69.7	18.63	15.87	17.3	18.16
CD (5%)	8.9	11.4		3.1	0.60	0.85		NS
N levels (RdN)								
75%	78.5	89.2	83.9	60.6	18.39	15.61	17.0	16.99
100%	87.9	101.2	94.6	69.2	18.36	15.91	17.1	17.49
125%	88.8	103.4	96.1	71.2	18.12	16.19	17.2	17.61
CD (5%)	8.9	11.4		3.1	NS	NS		NS

Table 1f: Cane yield (t/ha) and sucrose% of midlate maturing sugarcane genotypes in Plant I – Ratoon – Plant II cycle.

Treatments	Cane Yield (t/ha)				Sucrose %			
	Plant I (2012-13)	Plant II (2013-14)	Mean	Ratoon (2013-14)	Plant I (2012-13)	Plant II (2013-14)	Mean	Ratoon (2013-14)
Genotypes								
CoPb 08217	84.3	111.6	98.0	61.4	16.52	13.86	15.19	15.48
CoH 08263	92.7	124.6	108.7	81.5	15.47	13.18	14.33	14.83
CoH 08264	100.5	121.3	110.9	59.3	16.42	14.98	15.70	16.80
CD (5%)	10.1	9.7		9.7	0.75	0.64		1.02
N levels (RdN)								
75%	82.2	108.9	95.6	59.6	16.29	13.77	15.03	15.13
100%	95.4	123.7	109.6	70.3	15.77	14.08	14.93	16.02
125%	100.0	124.8	112.4	72.2	16.35	14.16	15.70	15.95
CD (5%)	10.1	9.7		9.7	NS	NS		NS

AS 63: Plant geometry in relation to mechanization in sugarcane
Objective:

1. To work out optimum plant geometry for use of farm machinery
2. To study varietal response to different planting geometry

Date of planting: 09.03.2013
Treatments:

A. Plant geometry

i. 120 cm row distance
ii. 150 cm row distance
iii. 30:120 cm paired

B. Genotype:

i. CoPb 09181
ii. CoJ 64
iii. CoJ 88
iv. CoS 8436

Design: Split plot
Replication: Three

Results: At wider row spacing of 150 cm there is significant reduction in shoots, millable canes and cane yield (Table 2a). Although there is improvement in cane diameter and single cane weight at wider spacing. In paired row (120:30 cm) there are more number of shoots and millable canes but there is significant reduction in cane weight.

Among the varieties CoPb 09181, CoS 8436 and CoJ 88 are significantly better than CoJ 64. CoPb 09181 has the highest single cane weight and cane yield. CoJ 88 has the highest number of shoots and millable canes. CoJ 88 has the highest sucrose % followed by CoJ 64 and CoPb 09181.

On the basis of two years data it can be concluded that paired row (120:30 cm) is the best method on the basis of cane yield (Table 2b) and sugarcane variety CoPb 09181 is better in can yield than other three varieties.

Table 2a- Growth, yield and quality of sugarcane under different planting methods and varieties at Faridkot during 2013-14

Treatments	Ger. (%)	Tillers 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane Yield (t/ha)	Sucrose (%)
Plant geometry								
120 cm row distance	30.2	127.9	89.4	239	2.68	1247	90.2	15.64
150 cm row distance	31.4	108.9	77.7	228	2.74	1325	75.8	15.64
30:120 cm paired	34.5	177.3	120.8	241	2.62	1097	98.4	15.28
CD (5%)	NS	18.5	15.8	NS	NS	100	16.4	NS
Varieties								
CoPb 09181	30.5	130.4	85.4	274	2.94	1691	124.8	15.04
CoJ 64	34.1	139.8	107.2	220	2.53	1001	66.4	15.97
CoJ 88	29.6	140.2	92.6	245	2.52	1105	78.4	16.36
CoS 8436	34.0	141.6	98.9	203	2.73	1096	82.8	14.71
CD (5%)	3.1	NS	13.6	26	0.21	121	10.2	0.93

Table 2b- Cane yield of sugarcane under different planting methods and varieties at Faridkot during 2012-13 and 2013-14

Treatments	Cane yield (t/ha)		
	2012-13	2013-14	Average
Plant geometry			
120 cm row distance	63.7	90.2	77.0
150 cm row distance	58.1	75.8	67.0
30:120 cm paired	74.4	98.4	86.4
CD (5%)	7.1	16.4	
Varieties			
CoPb 09181	82.3	124.8	103.6
CoJ 64	59.7	66.4	63.1
CoJ 88	79.6	78.4	79.0
CoS 8436	54.0	82.8	68.4
CD (5%)	4.7	10.2	

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

Date of Planting: 10.02.2013

Variety: CoH 119

Initial Soil Status:

Sandy Loam, pH: 8.4, EC: 0.47 m mhos/cm, OC: 0.35%

P_2O_5: 6.25 kg per ha, K_2O: 455 kg per ha, S= 98 ppm, Zn= 1.83 ppm, Fe= 3.46 ppm, Mn= 4.5 ppm

Treatments:

T1: Control (No fertilizer)

T2: N (150 kg/ha)

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 (190 kg N and 30 kg P_2O_5/ha)

T13: FYM 20 t/ha

(P= 30 kg P_2O_5/ha, K= 60 kg K/ha, S= 40 kg/ha elemental sulphur, Zn= 25 kg $ZnSO_4$/ha, Fe= Foliar spray of 1% Fe SO_4 thrice in weekly intervals at vegetative stage, Mn= 5 kg Mn SO_4/ha)

Results: Cane yield with soil test based fertilizer application was the highest (123.2 t/ha) and was at par with additional application of Zn, Fe, Mn and their combination to recommended NPK i.e. T_7 to T_{11} (Table 3) and was significantly better than control (T_1), application of FYM @20 t/ha (T_{13}), Application of N (T_2), NP (T_3), NPK (T_4) and NPK+S (T_5). Same is the case with number of millable canes.

Table 3: Growth, yield and quality of sugarcane during 2013-14 under various treatments

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	Sucrose (%)
T_1: No fertilizer	29.5	165.1	82.9	273	2.68	1492	95.6	13.98
T_2: N (150 kg/ha)	29.3	193.0	96.2	282	3.02	1620	106.2	14.89
T_3: NP	28.3	193.7	95.4	283	2.85	1637	106.8	14.68
T_4: NPK	29.1	195.1	95.2	271	2.78	1642	108.1	14.95
T_5: NPK +S	28.5	199.2	94.9	273	2.93	1720	109.5	14.67
T_6: NPK +Zn	28.1	195.6	105.1	279	2.93	1753	116.8	14.41
T_7: NPK +Fe	28.3	203.4	102.9	288	3.21	1760	112.7	14.83
T_8: NPK +Mn	29.6	194.9	106.7	270	3.03	1783	108.4	14.98
T_9: NPK +S +Zn	27.8	230.7	107.9	274	2.95	1738	117.3	15.28
T_{10}: NPK +S + Zn + Fe	26.8	196.4	103.3	272	2.74	1753	115.6	14.60
T_{11}: NPK +S + Zn + Fe + Mn	30.5	194.7	101.1	279	2.90	1867	113.9	14.88
T_{12}: Soil test based (190 kg N and 30 kg P_2O_5/ha)	29.1	214.8	111.4	283	2.86	1827	123.2	14.70
T_{13}: FYM 20 t/ha	28.4	210.8	93.6	287	2.89	1823	101.3	14.49
CD (5%)	NS	NS	12.2	NS	NS	NS	11.8	NS

AS 65: Enhancing sugarcane productivity and profitability under wheat-sugarcane cropping system

Objective: To enhance the productivity of sugarcane under wheat-sugarcane cropping system

Treatments:

T1: Autumn sugarcane, T2: T1+ wheat (1:2), T3: T1 + wheat (1:3)
T4: Wheat sown on 15 Nov. – late sugarcane
T5: Wheat sown on 15 Dec. – late sugarcane
T6: FIRB wheat 15th Nov. (75 cm with 3 rows of wheat) + sugarcane in furrows in 3rd week of February
T7: FIRB wheat 15th Nov. (75 cm with 3 rows of wheat) + sugarcane in furrows in 3rd week of March
T8: FIRB wheat 15th Dec. (75 cm with 3 rows of wheat) + sugarcane in furrows in 3rd week of February
T9: FIRB wheat 15th Dec. (75 cm with 3 rows of wheat) + sugarcane in furrows in 3rd week of March
DOS of Wheat: 15.11.2012, 15.12.2012
Sugarcane: T1-T3: 10.10.2012 T4-T5: 29.04.2013,T6, T8: 28.02.2013,T7, T9: 28.03.2013

Table 4: Growth, yield and quality of sugarcane during 2012-14 under various treatments

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter(cm)	Single cane wt.(g)	Cane yield (t/ha)	Sucrose (%)	Wheat yield (q/ha)
T_1	30.3	159.3	107.3	240	2.74	989	80.2	17.27	-
T_2	29.9	110.1	96.6	204	2.52	891	65.9	17.06	39.6
T_3	30.0	97.2	98.8	207	2.44	898	64.9	17.30	44.8
T_4	25.7	143.0	89.6	179	2.37	681	51.4	15.78	51.4
T_5	26.4	176.3	88.1	177	2.31	703	53.1	15.50	44.6
T_6	35.6	235.3	106.2	232	2.55	832	74.1	16.26	51.0
T_7	31.8	242.2	106.1	206	2.50	825	72.8	16.30	50.3
T_8	35.0	256.3	109.3	208	2.52	832	74.3	16.40	44.1
T_9	31.0	175.6	109.6	200	2.50	843	71.9	16.34	44.6
CD (5%)	5.2	39.2	14.1	NS	NS	119	9.5	NS	5.2

Results: The wheat sown in November is significantly better than December sowing (Table 4). The sugarcane sown in furrows of FIRB sown wheat in the February and March was significantly better than sugarcane planted after wheat harvest and was at par with autumn sole sugarcane. Same was case for germination, number of shoots, number of millable canes and cane weight.

AS 66: Priming of cane node for accelerating germination

Objectives:

i. To find out suitable cane node priming technique
ii. To assess the effect of cane node on acceleration of germination

DOP: 22. 03.2013
Design: RBD
Replication: Four
Treatments:
T1: Un- primed cane nodes
T2: Treating cane node in hot water at 50 ^{0}C for 2 hours
T3: Treating the cane node in hot water (50 ^{0}C) urea solution (3%) for 2 hours
T4: Priming cane nod with cattle dung, cattle urine and water in 1: 2: 5% ratio
T5: Conventional 3 –bud sett planting
*T6: Primed and sprouted cane node (Incubated for four days after priming)
(*Put the single cane node in the slurry of cattle dung, cattle urine and water for 15 minutes. Take out the buds and put in decomposed FYM and cover it with sugarcane trash for 4-5 days for sprouting)
Note: Depth of planting = 10 cm, soil cover= 2.5 cm and plant to plant spacing: 30 cm
Results: Germination% of single bud was significantly better than three budded setts (Table 5). Three budded planting was significantly better than all single bud treatments. Among single bud treatments priming has some positive effect but not significant statistically.

Table 5: Growth, yield and quality of sugarcane during 2013-14 under various treatments

Treatments	Germination (%)		No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	Sucrose (%)
	30DAS	40DAS							
T_1	68.3	70.7	121.7	88.9	210	2.50	825	62.7	16.59
T_2	69.7	72.1	142.6	93.2	207	2.63	874	65.1	16.62
T_3	68.7	69.7	144.7	97.7	209	2.52	800	66.0	16.03
T_4	49.6	51.0	105.1	82.4	205	2.63	825	65.1	16.80
T_5	38.4	43.9	174.8	108.6	235	2.55	951	86.5	16.17
T_6	53.1	54.5	100.9	89.6	201	2.48	827	64.4	15.53
CD (5%)	12.2	11.3	26.2	12.2	19	NS	NS	4.5	NS

AS-67: Optimization of fertigation schedule for sugarcane through micro irrigation technique under different agro-climatic conditions

Objective: To economize water use in cultivation and improve sugarcane productivity.

*Treatments: **A. Irrigation water/ method applied:**

I_1: Drip irrigation at 75% Pan Evaporation (PE)-irrigation once in two days.

I_2: Drip irrigation at 100% Pan Evaporation (PE)-irrigation once in two days.

I_3: Drip irrigation at 125% Pan Evaporation (PE)-irrigation once in two days.

I_4: Farmer's practice-surface irrigation

B. Nitrogen Levels:

N1: 100% recommended dose of nitrogen (RDN)

N2: 75% (RDN)

N3: 50% (RDN)

**Treatments modified*

DOP: 02.04.2013

Results: Drip irrigation at 100% and 125% CPE/IW ratio was at par with surface irrigation in millable canes and cane yield (Table 6). When drip irrigation was applied at 75% CPE/IW the cane yield was significantly lower than surface irrigation. Cane yield with 100% recommended dose of nitrogen (RDN) was significantly better than 50% RDN and was at par with 75% RDN. Same is the trend for millable canes.

Table 6: Yield and quality of sugarcane under different irrigation methods and nitrogen levels at Faridkot during 2013-14

Treatments	Germination (%)	No. of Shoots 000/ha	NMC 000/ha	Cane length (cm)	Cane diameter (cm)	Single cane wt. (g)	Cane yield (t/ha)	Sucrose (%)
Irrigation water/ method applied:								
Drip irrigation at 75% Pan Evaporation (PE)-irrigation once in two days	33.5	138.1	101.2	174	2.38	713	56.7	17.84
Drip irrigation at 100% Pan Evaporation (PE)-irrigation once in two days	32.4	149.2	115.1	182	2.44	731	71.7	17.83
Drip irrigation at 125% Pan Evaporation (PE)-irrigation once in two days	34.9	147.2	126.9	187	2.51	817	74.4	18.45
Farmer's practice-surface irrigation	31.3	153.4	118.9	178	2.47	770	68.8	17.64
CD (5%)	NS	NS	14.8	NS	NS	NS	10.0	NS
N levels (kg N/ha)								
100% recommended dose of nitrogen (RDN)	33.6	155.6	119.7	184	2.49	775	74.1	17.54
75% (RDN)	31.9	144.3	115.8	178	2.45	759	68.5	18.15
50% (RDN)	33.7	141.1	111.1	178	2.40	739	61.0	18.12
CD (5%)	NS	NS	5.3	NS	NS	NS	6.8	0.51