

Information of the coordinated project on AICRP on sugarcane

1. Introduction

Sugarcane is a universal crop having sweetening agent (sucrose) and it is the primary age old source of it. It is cultivated both in tropical and sub-tropical areas of India. Sugarcane is one of the most important agro industrial crop in the country, with 4.29 million hectares under cultivation, about 300 millions tonnes productions with an average productivity of around 70 tonnes per hectare. The approximate sugarcane coverage is 2 % of the net sown area of the country. Sugarcane occupies a key position in Indian agriculture by virtue of its wide distribution in most of the states of the country. Although area under the crop remains more or less static, yet the research outcome has accelerated vertical growth in sugarcane production. India today tops among the sugar producing countries of the world both in production as well as consumption. A bumper crop of sugarcane coupled with higher recovery of sugar from cane has contributed to this all time high record production of sugar during this season. However, it is not all, we have to go a long way in meeting the projected demand of 27 million tons of sugar by 2020 AD.

There are about 435 sugar factories in the country. This industry is the second largest agro based industry. The by product of sugarcane are also of immense economic importance. The chief byproduct is Molasses, which is used as a raw material by alcohol based industries. The second byproduct, sugarcane bagasse is chief source of fuel in sugar mills. Excess bagasse is used by paper industries. Another byproduct, press mud is of immense importance from farmer point of view.

2. historical background of the centre :-

Sugarcane research work at this station started in March, 1996 when AICRP on sugarcane - Kota came into function, the project was sanctioned in the year 1994-95 vide ICAR letter No. 10 – 17 /92 –CC(1) dated 7.8.95, fresh administrative & financial sanction was issued by the comptroller, RAU, Bikaner vide letter No. PD/Gr.II/ICAR/26/93-94/7814-24 dated 25/27.1.1996.

3. Mandate and objectives: -

The main objectives of the project are as under:

- To evolve / identify promising early and mid-late duration sugarcane varieties having better yield and sucrose than the existing standards.
- To evolve / identify promising high yield and high sucrose variety having better ratooning ability along with tolerance to moisture stress and also resistance to various diseases and pests.
- Breeder seed production to cope up the farmers demand for quality seed.
- Development of suitable crop geometry, efficient nutrient management and economic weed control to get maximum yield and sucrose both in plant and ratoon crops.
- Transfer of improved technology through frontline demonstrations and making new varieties popular among farming community.
- Survey and screening of sugarcane varieties for red-rot and smut.
- To coordinated and monitor multi location testing of germplasm
- To enhance and maintain disease free nucleus seed material distribution

4. Organization and structure:

The ARS Kota centre which is a unit of Agriculture university, Kota comes in zone Vth (Humid South Eastern Plain) which includes the district of Kota, Bundi, Baran, Jhalawar and part of sawaimadhopur, lies in the south eastern of the state of Rajasthan. Rain fall of the zone varies from

650 to 1000 mm. The main Crop of the rabi season are Wheat, Mustard, Coriander, Chickpea and Sugarcane etc.

At this station about 42 scientist including nearly 75 supporting staff with a self content sylvan complex having 103 hector farm areas. Besides AICRP on sugarcane, 13 ICAR project, state & non plan projects are also working at the centre. In the state sugarcane occupies nearly 10,000 ha area with the production 42, 1716 tonne & productivity 42226 kg /ha. At the centre main activity includes research work based on ICAR requirement, feed back problems of zone , extension activities , plant clinic services, medium rang whether forecast to farmers and seed production of new varieties .The centre also multiply seed of recommend varieties of the zone .

5. Staff position:-

Discipline	Post
Plant Breeding & Genetics	Dr. Pramod Kumar Sugarcane Breeder (2013 to continue)
Agronomy	Dr. B.S. Meena Sugarcane Agronomist (2013 to continue)
Technical Staff	Sh C.L. Gour Technical Assistant Sh. P.L. Dhakar Technical Assistant

6. Budget Position:

(In Rs)

Opening balance (2013-14)	Remittance by ICAR (2013-14)	Total fund (2013-14)	Actual expenditure for the year	ICAR share 75%	State share 25%	Closing balance end of the year (March 31 th ,2014)
1*	2**	3	4	5	6	
(+) 389003	32,23,000	36,12,003	37,85,729	28,39,297	9,46,432	(+) 7,72,706

* AUC.MPUAT/CA/KKG&CO/ICAR/2012-13/100 dt.8.7.2013

** vide AICRP (S) letter No-F.15-4/2013-PCS/ dt.26.4.2013

* * vide AICRP (S) letter No-F.15-4/2013-PCS/ dt.8.11.2013

* * vide AICRP (S) letter No-F.15-4/2014-PCS/ dt.19.3.2014

ANNUAL REPORT
CROP IMPROVEMENT
(Year 2013-2014)

Expt. No. 1: Sugarcane / Breeding/ Kota / 2013-14/Spring-1

1. Name of project : AICRP on Sugarcane
2. Zone/Location : North West Zone
Agriculture Research Station Umedganj, Kota.
3. Name of trial : Advance Varietal Trial – Early (II Plant)
4. Year of start : Continue
5. Objective: : To identify a promising early duration variety having better tonnage and sucrose than the existing varieties for the zone
6. Brief description of the experiment:
 - (i) No. of Entries : 3+2=5
 - (ii) Treatments : CoPb-08211 Standards
CoPb-08212 CoJ-64
CoS-08233 Co Pant-84211
 - (iii) Design : R. B. D.
 - (iv) Replication : Three
 - (v) Plot size :
Gross : 6m x 8r x 0.75m
Net : 5m x 6r x 0.75m
 - (vi) Fertilizers : 200:60:60 N P K kg/ha, respectively
 - (vii) Weed control : Spray of Atrazine @ 2.0 kg a. i. /ha as PE followed by one hand weeding at 60 days after planting
 - (viii) Date of Planting : 20.03.2013
 - (ix) Date of Harvesting : 04.03.2014
7. Results:
The advance trial of early maturity group comprising five test entries, the variety CoPb-08211 exhibited highest cane yield (83.26 t/ha) and CCS (10.10 t/ha), closely followed by CoS-08233, which gives cane yield (79.79 t/ha) and CCS (9.90 t/ha). The variety CoS-08233 showed highest germination (46.56 %) followed by variety CoPb-08211 (44.47%) and standard check variety CoJ-64 (41.86 %). The maximum number of cane tillers/ha was recorded for the variety CoS-08233 (144.11) closely followed by standard check varieties CoPant-84211 (142.62) and CoJ-64 (142.21). The maximum number of malleable canes ('000/ha) was recorded for the variety CoPant-84211 (84.81) closely followed by CoPb-08211 (84.61) and CoPb-08212 (84.09). The highest estimates of Brix (20.70 %), Sucrose (18.17%), Purity (87.75 %), CCS (12.52%), extraction (54.17%) and plant length (211.59 cm) was recorded for the variety CoPb-08212 at harvest, while variety CoPb-08211 showed maximum diameter (2.40cm). (Table-1)
8. Significant findings : Research in progress
9. Scientist attached : Dr. P. Kumar, Sugarcane Breeder

Table 1: Advance Varietal Trial – Early (II Plant) - 2013-14

Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10 m)	NMC at 10 m ('000/ha)	Stalk length (cm)
1	2	3	4	5	6	7	8	9	10
CoPb-08211	10.10	83.26	20.19	17.64	87.38	12.13	52.52	84.61	196.93
CoPb-08212	9.48	75.72	20.70	18.17	87.75	12.52	54.17	84.09	211.59
CoS-08233	9.90	79.79	20.54	18.04	87.68	12.42	53.30	83.85	194.42
Standards									
CoJ-64	8.39	74.95	19.21	16.64	86.60	11.19	52.10	82.79	185.17
CoPant-84211	8.86	75.82	19.77	17.04	86.77	11.69	52.27	84.81	194.74
SEm±	0.302	2.315	0.143	0.158	0.123	0.128	0.251	1.608	3.484
CD. (at 5%)	0.879	6.731	0.417	0.458	0.359	0.373	0.730	4.675	10.128
CV (%)	7.84	7.21	1.73	2.18	0.34	2.60	1.15	4.64	4.30

Clone	Stalk diameter (cm)	Single cane weight (kg)	Brix % (8m)	Sucrose % (8 m)	Purity % (8m)	CCS % (8m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
11	12	13	14	15	16	17	18	19
CoPb-08211	2.40	0.99	17.74	15.15	85.40	10.30	142.18	44.47
CoPb-08212	2.16	0.98	18.29	15.62	85.70	10.64	138.05	40.40
CoS-08233	2.12	0.94	18.19	15.59	85.66	10.61	144.11	46.56
Standards								
CoJ-64	1.99	0.93	17.47	14.84	84.96	10.02	142.21	41.86
CoPant-84211	1.85	0.99	17.50	14.83	84.94	9.93	142.62	40.69
SEm±	0.022	0.018	0.143	0.165	0.152	0.147	3.684	1.301
CD. (at 5%)	0.063	0.053	0.415	0.478	0.441	0.427	10.710	3.783
CV (%)	2.51	4.58	1.94	2.62	0.43	3.46	6.30	7.37

Expt. No. 2 Sugarcane / Breeding/ Kota / 2013-14/Spring-2

1. Name of project : AICRP on Sugarcane
2. Zone/Location : North West Zone
Agriculture Research Station, Ummedganj, Kota.
3. Title of Experiment : Advance Varietal Trial – Early (I Plant)
4. Year of start : Continue
5. Objective: : To identify a promising early duration variety having better tonnage and sucrose than the existing varieties for the zone
6. Brief description of the experiment:
 - (i) No. of Entries : 5+2=7
 - (ii) Treatments : CoH-09262 Standards
CoH-09263 CoJ-64
CoLk-09202 Co Pant-84211
CoPb-09181
CoS-09246
 - (iii) Design : R. B. D.
 - (iv) Replication : Three
 - (v) Plot size :
Gross : 6m x 8r x 0.75m
Net : 5m x 6r x 0.75m
 - (vi) Fertilizer : 200:60:60 N P K kg/ha, respectively
 - (vii) Weed control : Spray of Atrazine @ 2.0 kg a. i. /ha as PE followed by one hand weeding at 60 days after planting
 - (viii) Date of Planting : 18.03.2013
 - (ix) Date of Harvesting : 04.03.2014
7. Results:
Among the seven test entries, the varieties CoPb-09181 (78.83 t/ha) and CoH-09263 (78.83 t/ha) exhibited highest cane yield along with highest CCS (10.53 t/ha) and (9.66 t/ha, respectively). The maximum number of cane tillers/ha were recorded in the standard check varieties CoPant-84211 (139.80 thousand) and CoJ-64 (135.16 thousand), while maximum number of malleable canes ('000/ha) was recorded in the variety CoPb-09181 (91.33) followed by CoH-09262 (88.22), while NMCs for standard varieties were CoJ-64 (83.21) and CoPant-84211 (83.16). At harvest, highest estimates for the traits Brix (21.80%), Sucrose (19.31%), Purity (88.63%), and CCS (13.36%) were recorded for the variety CoPb-09181. The maximum extraction percentage was recorded for CoS-09246 (53.98%) followed by CoH-09262 (53.92%). The highest germination was recorded in the variety CoPb-09181 (42.93%) closely followed by CoH-09262 (42.46 %) and standard check variety CoJ-64 (42.34%). (Table-2)
8. Significant findings : Research in progress
9. Scientist attached : Dr. P. Kumar, Sugarcane Breeder

Table 2: Advance Varietal Trial – Early (I Plant) - 2013-14

Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10 m)	NMC at 10 m ('000/ha)	Stalk length (cm)
1	2	3	4	5	6	7	8	9	10
CoH- 09262	8.98	74.12	20.18	17.63	87.37	12.12	53.92	88.22	194.37
CoH-09263	9.66	78.83	20.36	17.82	87.51	12.26	52.93	87.58	195.14
CoLk-09202	9.20	76.21	20.15	17.54	87.35	12.10	52.17	85.11	202.83
CoPb-09181	10.53	78.83	21.80	19.31	88.63	13.36	53.05	91.33	202.20
CoS-09246	9.33	77.05	20.17	17.63	87.37	12.12	53.98	85.92	191.22
Standards									
CoJ-64	8.59	73.28	19.66	17.10	86.97	11.73	51.88	83.21	184.34
CoPant-84211	9.22	76.74	20.05	17.50	87.21	12.03	53.41	83.16	193.22
SEm±	0.385	3.357	0.197	0.205	0.156	0.150	0.271	3.355	1.600
CD. (at 5%)	1.119	9.759	0.573	0.597	0.452	0.436	0.788	9.754	4.651
CV (%)	7.12	7.61	1.68	2.00	0.31	2.12	0.89	6.73	1.42

Clone	Stalk diameter (cm)	Single cane weight (kg)	Brix % (8m)	Sucrose % (8 m)	Purity % (8m)	CCS % (8m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
11	12	13	14	15	16	17	18	19
CoH- 09262	1.98	0.88	18.90	15.63	85.70	10.66	132.19	42.46
CoH-09263	2.08	0.87	17.60	14.98	85.09	10.17	126.36	38.67
CoLk-09202	2.03	0.85	17.37	14.74	84.87	10.10	132.13	40.51
CoPb-09181	2.07	0.88	19.11	16.53	86.50	11.31	131.41	42.93
CoS-09246	1.92	0.91	17.45	14.82	84.92	10.04	133.54	42.22
Standards								
CoJ-64	1.90	0.86	17.39	14.76	84.79	10.20	135.16	42.34
CoPant-84211	2.05	0.83	17.59	14.90	85.06	10.15	139.80	37.00
SEm±	0.023	0.017	0.257	0.155	0.153	0.167	6.724	2.020
CD. (at 5%)	0.067	0.050	0.747	0.450	0.444	0.486	19.547	5.873
CV (%)	2.00	3.46	2.48	1.76	0.31	2.79	8.76	8.56

Expt. No. 3: Sugarcane / Breeding/ Kota / 2013-14/Spring-3

1. Name of project : AICRP on Sugarcane
2. Zone/Location : North West Zone
Agriculture Research Station Ummedganj, Kota.
3. Title of Experiment : Initial Varietal Trial – Early
4. Year of start : Continue
5. Objective: : To identify a promising early duration variety having better tonnage and sucrose than the existing varieties for the zone
6. Brief description of the experiment:
 - (i) No. of Entries : 4+2=6
 - (ii) Treatments : Co-10035 Standards
CoH-10261 CoJ-64
CoH-10263 Co Pant-84211
CoS-10231
 - (iii) Design : R. B. D.
 - (iv) Replication : Three
 - (v) Plot size :
Gross : 6m x 6r x 0.75m
Net : 5m x 4r x 0.75m
 - (vi) Fertilizer : 200:60:60 N P K kg/ha, respectively
 - (vii) Weed control : Spray of Atrazine @ 2.0 kg a. i. /ha as PE followed by one hand weeding at 60 days after planting
 - (viii) Date of Planting : 19.03.2013
 - (ix) Date of Harvesting : 07.03.2014
7. Results:
In this trial, the highest germination was recorded in the variety CoS-10231 (43.32%) closely followed by variety Co-10035 (42.60%) and standard check variety CoJ-64 (40.93 %). The maximum number of cane tillers/ha was recorded in the variety Co-10035 (134.82 thousand) closely followed by CoS-10231 (131.62 thousand) and standard CoPant-84211 (128.27 thousand). But, the maximum number of malleable canes ('000/ha) was recorded for the variety CoS-10231 (87.13) followed by CoH-10261 (85.62), while in standard variety CoJ-64 (83.22) and CoPant-84211 (83.15). The variety Co-10035 gives highest cane yield (79.78 t/ha) followed by CoH-10261 (75.76 t/ha), while CCS was maximum for Co-10035 (10.32 t/ha), closely followed by CoS-10231 (9.58). The Brix (21.21 %), Sucrose (18.74 %), Purity (88.18 %) and CCS (12.94%) were highest for the variety Co-10035, while extraction percentage was maximum for variety CoH-10261 (54.12%) at the time of harvest. (Table-3)
8. Significant findings : Research in progress
9. Scientist attached : Dr. P. Kumar, Sugarcane Breeder

Table 3: Initial Varietal Trial – Early- 2013-14

Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10 m)	NMC at 10 m ('000/ha)	Stalk length (cm)
1	2	3	4	5	6	7	8	9	10
Co-10035	10.32	79.78	21.21	18.74	88.18	12.94	52.35	84.42	199.55
CoH-10261	8.88	75.76	19.66	17.10	86.97	11.73	54.12	85.62	207.07
CoS-10231	9.58	74.50	21.16	18.65	87.93	12.87	53.63	87.13	202.24
Standards									
CoJ-64	8.05	70.73	19.23	16.66	86.55	11.34	52.64	83.22	190.37
CoPant-84211	8.82	73.99	20.06	17.72	87.30	11.92	52.18	83.15	189.25
SEm±	0.167	2.249	0.171	0.163	0.164	0.164	0.230	2.739	1.810
CD. (at 5%)	0.485	6.540	0.498	0.475	0.476	0.476	0.669	7.963	5.261
CV (%)	4.43	7.28	2.05	2.23	0.45	0.45	1.05	6.73	2.18

Clone	Stalk diameter (cm)	Single cane weight (kg)	Brix % (8m)	Sucrose % (8 m)	Purity % (8m)	CCS % (8m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
11	12	13	14	15	16	17	18	19
Co-10035	2.00	0.81	19.07	16.53	86.70	11.30	134.82	42.60
CoH-10261	2.05	0.81	17.52	14.90	85.02	10.11	124.11	39.91
CoS-10231	2.13	0.84	18.50	15.90	85.94	10.88	131.62	43.32
Standards								
CoJ-64	1.93	0.79	17.17	14.53	84.65	9.84	128.09	40.93
CoPant-84211	2.04	0.80	17.83	15.21	85.31	10.33	128.27	39.92
SEm±	0.062	0.018	0.150	0.164	0.148	0.123	4.793	1.104
CD. (at 5%)	0.180	0.053	0.436	0.477	0.431	0.356	13.935	3.209
CV (%)	2.47	5.41	2.02	2.58	0.42	2.83	8.98	6.48

Expt. No. 4: Sugarcane / Breeding/ Kota / 2013-14/Spring-4

1. Name of project : AICRP on Sugarcane
2. Zone/Location : North West Zone
Agriculture Research Station Ummeganj, Kota.
3. Name of trial : Advance Varietal Trial – Mid Late (II Plant)
4. Year of start : Continue
5. Objective: : To identify a promising mid late duration variety having better tonnage and sucrose than the existing varieties for the zone.
6. Brief description of the experiment:
 - (i) No. of Entries : 6+3=9
 - (ii) Treatments : CoH-08262 Standards
CoH-08263 CoS-767
CoH-08264 CoS-8436
CoPb-08217 Co Pant-97222
CoS-08234
CoS-08235
 - (iii) Design : R. B. D.
 - (iv) Replication : Three
 - (v) Plot size :
Gross : 6m x 8r x 0.75m
Net : 5m x 6r x 0.75m
 - (vi) Fertilizers : 200:60:60 N P K kg/ha, respectively
 - (vii) Weed control : Spray of Atrazine @ 2.0 kg a. i. /ha as PE followed by one hand weeding at 60 days after planting
 - (viii) Date of Planting : 20.03.2013
 - (ix) Date of Harvesting : 03.03.2014
7. Results:
Based on mean performance of various entries it was concluded that highest germination was recorded in entry CoPb-08217 (46.43%) followed by variety CoH-08263 (46.25%) and CoH- 08262 (45.12%). The maximum number of tillers was recorded for test entry CoS-08234 (125.48 thousand/ha) followed by entry CoH-08264 (123.35 thousand/ha) and standard check variety CoS-8436 (122.79 thousand/ha). The maximum number of malleable canes (‘000/ha) were recorded for variety CoH- 08262 (98.33) followed by CoPb-08217 (99.17). The variety CoH-08264 gives highest cane yield (82.92 t/ha), closely followed by CoH- 08262 (81.19 t/ha). The test entry CoH- 08262 exhibited highest estimates of CCS (10.28 t/ha), Brix (20.89%), Sucrose (18.36%), Purity (88.11%), CCS (12.66%) and extraction (55.16%) at harvest. (Table-4)
8. Significant findings : Research in progress
9. Scientist attached : Dr. P. Kumar, Sugarcane Breeder

Table 4: Advance Varietal Trial - Midlate (II Plant) - 2013-14

Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (12 m)	Sucrose % (12m)	Purity % (12m)	CCS % (12m)	Extraction % (12 m)	NMC at 12 m ('000/ha)	Stalk length (cm)
1	2	3	4	5	6	7	8	9	10
CoH- 08262	10.28	81.19	20.89	18.36	88.11	12.66	55.16	98.33	208.63
CoH-08263	10.08	80.67	20.68	18.15	87.76	12.51	53.64	92.47	220.72
CoH-08264	9.74	82.92	19.69	17.13	86.99	11.75	54.15	93.18	210.03
CoPb-08217	9.79	78.68	20.59	18.06	87.70	12.44	54.52	94.54	215.53
CoS-08234	9.00	79.44	19.15	16.55	87.37	11.34	54.56	93.15	220.39
CoS-08235	9.44	70.53	19.66	17.10	86.96	11.73	54.50	87.89	212.45
Standards									
CoS-767	8.40	73.42	19.16	16.58	86.55	11.45	54.39	83.25	201.69
CoS-8436	9.55	79.30	20.26	17.72	87.44	12.21	53.53	84.37	212.61
CoPant-97222	8.56	73.02	19.65	17.09	86.95	11.72	54.84	82.48	205.53
SEm±	0.144	2.590	0.107	0.109	0.188	0.080	0.197	2.457	1.016
CD. (at 5%)	0.418	7.530	0.311	0.318	0.548	0.232	0.574	7.143	2.954
CV (%)	5.28	11.55	1.86	2.18	0.75	2.31	1.26	9.46	1.66

Clone	Stalk diameter (cm)	Single cane wt (kg)	Brix % (10m)	Sucrose % (10 m)	Purity % (10m)	CCS % (10m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
11	12	13	14	15	16	17	18	19
CoH- 08262	2.09	0.82	18.27	15.67	85.75	10.68	122.77	45.12
CoH-08263	2.23	0.82	18.50	15.91	85.96	10.85	112.22	46.25
CoH-08264	2.08	0.87	17.90	15.28	85.42	10.24	123.35	43.72
CoPb-08217	2.17	0.83	18.35	15.75	85.81	10.73	116.64	46.43
CoS-08234	2.19	0.86	17.25	14.61	84.71	9.89	125.48	43.96
CoS-08235	2.10	0.81	18.31	15.71	85.78	10.70	113.25	44.95
Standards								
CoS-767	2.04	0.79	17.55	14.92	85.00	10.12	111.41	40.16
CoS-8436	2.10	0.80	18.28	15.68	85.77	10.68	122.79	42.57
CoPant-97222	2.06	0.81	17.37	14.73	84.82	10.01	110.01	38.71
SEm±	0.017	0.019	0.110	0.114	0.113	0.085	3.223	1.191
CD. (at 5%)	0.049	0.056	0.321	0.331	0.328	0.246	9.369	3.461
CV (%)	2.75	8.04	2.13	2.57	0.46	2.81	9.50	9.47

Expt. No. 5: Sugarcane / Breeding/ Kota / 2013-14/Spring-5

1. Name of project : AICRP on Sugarcane
2. Zone/Location : North West Zone
Agriculture Research Station Ummedganj, Kota.
3. Title of Experiment : Advance Varietal Trial –Mid Late (I Plant)
4. Year of start : Continue
5. Objective: : To identify a promising mid late duration variety having better tonnage and sucrose than the existing varieties for the zone.
6. Brief description of the experiment:
 - (i) No. of Entries : 5+3=8
 - (ii) Treatments : Co-09022 Standards
CoH-09264 CoS-767
CoLk-09204 CoS-8436
CoPb-09214 Co Pant-97222
CoS-09232
 - (iii) Design : R. B. D.
 - (iv) Replication : Three
 - (v) Plot size
Gross : 6m x 8r x 0.75m
Net : 5m x 6r x 0.75m
 - (vi) Fertilizer : 200:60:60 N P K kg/ha, respectively
 - (vii) Weed control : Spray of Atrazine @ 2.0 kg a. i. /ha as PE followed by one hand weeding at 60 days after planting
 - (viii) Date of Planting : 18.03.2013
 - (ix) Date of Harvesting : 05.03.2014
7. Results :
In this trial, the highest germination was recorded in standard check variety CoS-8436 (42.04%) closely followed by variety CoS-09232 (41.93%) and variety CoH-09264 (41.21%). The maximum number of cane tillers per hectare was recorded for variety Co- 09022 (126.62 thousands) followed by CoH-09264 (125.89 thousands) and CoLk-09204 (123.62 thousands). The maximum number of malleable canes ('000/ha) was recorded in the variety CoH-09264 (95.67) followed by Co- 09022 (94.55). The highest cane yield was recorded for the check variety CoS-767 (80.88 t/ha), while CCS was highest for variety Co- 09022 (10.02 t/ha). The variety Co-09022 also possessed highest estimates of Brix (20.92%), Sucrose (18.39%), Purity (87.92%), and CCS (12.68%) at harvest. But the extraction percentage was maximum for the variety CoLk-09204 (55.58%). The longest cane was observed for the variety CoS-09232 (218.85cm), while thickest for standard check variety CoPant-97222 (2.21). (Table-5)
8. Significant findings : Research in progress
9. Scientist attached : Dr. P. Kumar, Sugarcane Breeder

Table 5: Advance Varietal Trial - Midlate (I Plant) - 2013-14

Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (12 m)	Sucrose % (12m)	Purity % (12m)	CCS % (12m)	Extraction % (12 m)	NMC at 12 m ('000/ha)	Stalk length (cm)
1	2	3	4	5	6	7	8	9	10
Co- 09022	10.02	79.05	20.92	18.39	87.92	12.68	53.92	94.55	206.98
CoH-09264	9.95	79.16	20.70	18.22	87.82	12.58	54.67	88.95	210.22
CoLk-09204	9.92	80.21	20.53	18.00	87.65	12.39	55.58	95.67	213.75
CoPb-09214	9.46	79.75	19.83	17.27	87.07	11.86	54.58	88.35	217.84
CoS-09232	9.78	79.74	20.37	17.83	87.60	12.27	53.51	89.49	218.85
Standards									
CoS-767	9.30	80.88	19.46	16.89	86.46	11.51	53.08	83.80	204.00
CoS-8436	9.05	79.16	19.26	16.69	86.63	11.43	53.14	83.53	206.28
CoPant-97222	9.64	79.80	20.13	17.59	87.34	12.09	52.42	84.97	213.16
SEm±	0.347	2.715	0.128	0.131	0.144	0.092	0.218	3.155	1.810
CD. (at 5%)	1.009	7.894	0.373	0.380	0.420	0.267	0.633	9.173	5.262
CV (%)	8.57	8.11	1.52	1.77	0.39	1.81	0.96	8.48	2.04

Clone	Stalk diameter (cm)	Single cane wt (kg)	Brix % (10m)	Sucrose % (10 m)	Purity % (10m)	CCS % (10m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
11	12	13	14	15	16	17	18	19
Co- 09022	2.17	0.83	18.27	15.67	85.74	10.67	126.62	39.97
CoH-09264	2.19	0.83	17.50	14.87	84.96	10.08	125.89	41.21
CoLk-09204	2.16	0.83	17.72	15.07	85.03	10.23	123.62	37.35
CoPb-09214	2.19	0.82	17.56	14.94	84.87	10.13	117.21	37.59
CoS-09232	2.20	0.82	17.31	14.68	84.78	10.01	119.31	41.93
Standards								
CoS-767	2.11	0.82	17.58	14.96	85.07	10.19	119.16	39.67
CoS-8436	2.06	0.82	17.49	14.86	84.95	10.07	113.98	42.04
CoPant-97222	2.21	0.82	16.71	14.23	84.28	9.61	116.96	40.81
SEm±	0.014	0.018	0.152	0.132	0.174	0.103	4.461	1.246
CD. (at 5%)	0.039	0.053	0.441	0.384	0.506	0.298	12.970	3.623
CV (%)	1.49	5.23	2.06	2.11	0.49	2.41	8.83	7.41

Expt. No. 6: Sugarcane / Breeding/ Kota / 2013-14/Spring-6

1. Name of project : AICRP on Sugarcane
2. Zone/Location : North West Zone
Agriculture Research Station Ummedganj, Kota.
3. Title of Experiment : Initial Varietal Trial –Mid Late
4. Year of start : Continue
5. Objective: : To identify a promising mid late duration variety having better tonnage and sucrose than the existing varieties for the zone.
6. Brief description of the experiment:
 - (i) No. of Entries : 10+3=13
 - (ii) Treatments : Co-10036 Standards
Co-10037 CoS-767
Co-10039 CoS-8436
CoH-10262 Co Pant-97222
CoH-10263
CoPant-10211
CoPb-10181
CoPb-10182
CoPb-10183
CoPb-10211
 - (iii) Design : R. B. D.
 - (iv) Replication : Three
 - (v) Plot size :
Gross : 6m x 6r x 0.75m
Net : 5m x 4r x 0.75m
 - (vi) Fertilizer : 200:60:60 N P K kg/ha, respectively
 - (vii) Weed control : Spray of Atrazine @ 2.0 kg a. i. /ha as PE followed by one hand weeding at 60 days after planting
 - (viii) Date of Planting : 19.03.2013
 - (ix) Date of Harvesting : 07.03.2014
7. Results :
Among test entries in this trial, the highest cane yield was recorded for the variety CoPb-10182 (82.27 t/ha) followed by CoPb-10183 (81.14 t/ha) and CoH-10262 (80.69 t/ha), while maximum CCS exhibited by CoPb-10183 (10.60 t/ha) followed by Co 10039 (10.40 t/ha) and CoPant-10221 (10.32 t/ha). The maximum number of cane tillers/ha was recorded in the variety CoH-10262 (132.95 thousands) closely followed by Co 10039 (130.16 thousand) and Co 10037 (129.53 thousands). But the maximum number of malleable canes ('000/ha) was recorded in the variety CoPant-10221 (89.60) followed by CoPb-10211 (88.67). At harvest, the Brix (21.50%), Sucrose (18.99%), Purity (88.33%), CCS (13.09%) was highest for the variety CoPb-10183, very closely followed by CoPant-10221 [Brix (21.50%), Sucrose (18.96%), Purity (88.36%), and CCS (13.09%)]. The maximum germination was recorded in the variety CoPb-10182 (44.01%) followed by standard variety Co 10036 (43.49) and variety CoH-10262 (43.43%). (Table-6)
8. Significant findings : Research in progress
9. Scientist attached : Dr. P. Kumar, Sugarcane Breeder

Table 6: Initial Varietal Trial -Midlate - 2013-14

Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (12 m)	Sucrose % (12m)	Purity % (12m)	CCS % (12m)	Extraction % (12 m)	NMC at 12 m ('000/ha)	Stalk length (cm)
1	2	3	4	5	6	7	8	9	10
Co 10036	10.25	79.87	21.14	18.61	88.06	12.68	54.24	81.74	183.97
Co 10037	9.95	80.38	21.08	18.53	88.32	12.81	54.63	83.57	188.61
Co 10039	10.40	80.28	21.35	18.85	88.22	13.01	55.04	86.84	189.74
CoH-10262	9.88	80.69	20.35	17.80	87.50	12.25	54.30	82.99	183.90
CoH-10263	9.47	78.57	20.26	17.78	87.44	12.05	55.20	82.16	181.48
CoPant-10221	10.32	78.93	21.50	18.96	88.36	13.09	54.88	89.60	198.09
CoPb-10181	8.92	79.78	19.17	16.59	86.53	11.19	54.87	86.40	196.86
CoPb-10182	9.60	82.27	19.59	17.04	86.92	11.67	53.22	87.17	175.21
CoPb-10183	10.60	81.14	21.50	18.99	88.33	13.09	52.40	85.02	194.06
CoPb-10211	10.20	79.49	21.09	18.57	86.74	12.83	54.91	88.67	189.03
Standards									
CoS-767	9.23	78.92	19.74	17.18	87.03	11.52	53.64	84.23	175.37
CoS-8436	9.48	80.29	19.39	16.72	86.73	11.52	54.36	83.46	183.98
CoPant-97222	9.21	79.66	19.46	16.89	86.80	11.58	53.78	82.02	177.04
SEm±	0.337	2.724	0.133	0.140	0.355	0.142	0.169	3.082	1.759
CD. (at 5%)	0.980	7.918	0.387	0.406	1.033	0.412	0.491	8.960	5.114
CV (%)	8.25	8.16	1.56	1.87	0.97	2.78	0.75	8.71	2.27

Clone	Stalk diameter (cm)	Single cane weight (kg)	Brix % (10m)	Sucrose % (10 m)	Purity % (10m)	CCS % (10m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
11	12	13	14	15	16	17	18	19
Co 10036	2.07	0.79	19.98	17.43	87.23	11.98	120.82	43.49
Co 10037	2.07	0.75	19.76	17.21	87.07	11.81	129.53	40.03
Co 10039	2.05	0.79	19.34	16.78	86.74	11.49	130.16	43.05
CoH-10262	2.04	0.77	18.25	15.65	85.77	10.49	132.95	43.43
CoH-10263	2.15	0.82	18.45	15.88	85.92	10.80	125.30	37.10
CoPant-10221	2.14	0.75	20.43	17.89	87.72	12.31	126.01	43.14
CoPb-10181	2.10	0.84	17.19	14.56	85.68	9.85	129.12	37.43
CoPb-10182	2.10	0.83	17.78	15.16	85.27	10.30	125.78	44.01
CoPb-10183	1.94	0.79	20.41	17.87	87.58	12.30	127.65	42.93
CoPb-10211	2.14	0.83	19.50	16.93	87.00	11.45	127.44	38.10
Standards								
CoS-767	2.12	0.78	17.69	15.08	85.20	10.24	121.49	39.92
CoS-8436	2.06	0.82	17.86	15.24	85.36	10.37	126.39	40.34
CoPant-97222	2.20	0.81	17.97	15.36	85.46	10.45	125.32	36.12
SEm±	0.018	0.021	0.146	0.152	0.268	0.119	5.963	1.602
CD. (at 5%)	0.053	0.060	0.425	0.443	0.780	0.346	17.337	4.656
CV (%)	2.08	6.19	1.86	2.25	0.75	2.58	11.28	9.44

Expt. No. 7: Sugarcane / Breeding/ Kota / 2013-14/Spring-7

- 1 Name of project : AICRP on Sugarcane
 2 Zone/Location : North West Zone
 Agriculture Research Station Ummedganj, Kota.
 3 Title of Experiment : Zonal Varietal Trial
 4 Year of start : Continue
 5 Objective: : To identify a promising early duration variety having better tonnage and sucrose than the existing varieties for the zone
 6 Brief description of the experiment:
 (i) No. of Entries : 4+2=6
 (ii) Treatments : Early Maturity Midlate Maturity Standards
 CoH-11261 Co-11026 CoJ-64
 CoH-11262 Co-11027 Co Pant-84211
 CoLk-11201 CoH-11263 Co-238
 CoLk-11202 CoH-11264 CoS-767
 CoLk-11203 CoLk-11204 CoS-8436
 CoPb-11211 CoLk-11205 Co Pant-97222
 CoPb-11212 CoLk-11206
 CoPb-11181
 CoPb-11182
 CoPb-11183
 CoPb-11214
 CoS-11231
 CoS-11232
 (iii) Design : Augmented.
 (iv) Replication : One with three blocks
 (v) Plot size
 Gross : 6m x 6r x 0.75m
 Net : 5m x 4r x 0.75m
 (vi) Fertilizer : 200:60:60 N P K kg/ha, respectively
 (vii) Weed control : Spray of Atrazine @ 2.0 kg a. i. /ha as PE followed by one hand weeding at 60 days after planting
 (viii) Date of Planting : 19.03.2013
 (ix) Date of Harvesting : 07.03.2014
 6. Results:
 In this trial, the variety CoH-11263 exhibited highest cane yield (88.67 t/ha) followed by CoS-11232 (87.95 t/ha), while CCS was maximum for standard check variety Co-238 (11.97 t/ha) closely followed by CoS-11232 (11.41 t/ha). The maximum number of cane tillers/ha was recorded in the variety Co-11027 (142.32 thousand) followed CoPb-11182 (141.20 thousand), while the maximum number of malleable canes ('000/ha) was recorded for variety CoH-11261 (87.54) followed by CoH-11262 (85.63). The Brix (21.51%) and Sucrose (19.01) were highest for the variety Co-11026 followed by CoLk-11202 (21.49%) and (18.98%), respectively, while extraction percentage was maximum for variety CoS-11232 (54.632%) at the time of harvest. The maximum germination was recorded in the variety CoH-11263 (45.32 %) followed by CoH-11261 (44.33%). (Table-7)
 7 Significant findings : Research in progress
 8 Scientist attached : Dr. P. Kumar, Sugarcane Breeder

Table 7: Zonal Varietal Trial –2013-14

Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10 m)	NMC at 10 m (‘000/ha)	Stalk length (cm)
1	2	3	4	5	6	7	8	9	10
Early Maturity			(10 m)	(10 m)	(10 m)	(10 m)			
CoH-11261	8.81	75.62	19.56	17.00	86.91	11.66	52.36	87.54	196.35
CoH-11262	9.61	81.25	19.79	17.23	87.06	11.83	54.25	85.63	199.25
CoLk-11201	9.73	79.45	20.34	17.80	87.51	12.25	51.52	79.45	187.65
CoLk-11202	10.67	81.32	21.49	18.98	88.32	13.12	53.20	76.85	188.59
CoLk-11203	9.22	78.68	19.64	17.08	86.97	11.72	49.65	83.24	195.25
CoPb-11211	10.03	77.59	21.23	18.72	88.18	12.93	48.75	84.20	201.32
CoPb-1121	9.12	73.55	20.54	18.01	87.68	12.40	51.25	83.56	196.64
Mid late			(12 m)	(12 m)	(12 m)	(12 m)			
Co-11026	11.24	85.61	21.51	19.01	88.37	13.14	53.14	83.12	205.64
Co-11027	10.35	85.52	20.16	17.61	87.39	12.11	52.68	82.45	211.05
CoH-11263	10.87	88.67	20.36	17.82	88.39	12.26	51.84	80.24	203.55
CoH-11264	10.33	84.04	20.41	17.87	87.58	12.30	49.84	78.65	214.65
CoLk-11204	10.07	86.31	19.57	17.01	86.92	11.66	53.24	78.59	200.35
CoLk-11204	11.01	79.63	18.95	16.37	86.39	13.83	47.29	79.51	199.52
CoLk-11205	9.43	82.54	19.25	16.68	86.65	11.42	45.85	81.32	199.01
CoPb-11181	9.09	83.54	18.56	15.96	86.04	10.89	49.68	84.36	212.35
CoPb-11182	10.19	87.62	19.54	16.97	86.89	11.63	52.34	85.21	195.95
CoPb-11213	9.30	85.36	18.69	16.01	86.15	10.90	49.61	81.02	189.56
CoPb-11214	10.10	87.35	19.45	16.88	86.82	11.57	53.65	79.25	207.11
CoS11231	10.21	84.45	20.14	17.59	87.33	12.09	51.61	76.95	215.65
CoS-11232	11.41	87.95	21.30	18.79	88.23	12.98	54.63	81.36	214.58
Standards									
Early Maturity			(10 m)	(10 m)	(10 m)	(10 m)			
CoJ-64	9.29	79.58	19.58	17.02	86.92	11.67	52.33	78.65	189.65
CoPant-84211	10.18	80.62	20.84	18.32	87.90	12.63	51.64	79.42	188.54
Co-238	11.97	81.67	19.98	17.43	87.23		49.81	79.95	201.35
Mid late			(12 m)	(12 m)	(12 m)	(12 m)			
CoS-767	9.91	84.56	19.64	17.08	86.97	11.72	52.15	81.25	215.68
CoS-8436	10.36	86.35	20.02	17.47	87.26	12.00	52.36	82.16	212.63
Co Pant-97222	10.54	85.62	20.43	17.89	87.60	12.31	48.95	81.69	214.85

Clone	Stalk diameter (cm)	Single cane wt (kg)	Brix % (8m)	Sucrose % (8 m)	Purity % (8m)	CCS % (8m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
11	12	13	14	15	16	17	18	19
Early Maturity			(8m)	(8m)	(8m)	(8m)		
CoH-11261	1.98	0.93	18.25	15.64	85.75	10.65	110.23	44.33
CoH-11262	1.96	0.96	18.02	15.41	85.52	10.48	105.25	45.25
CoLk-11201	2.04	1.02	17.51	14.88	85.01	10.09	112.36	38.59
CoLk-11202	2.00	0.99	18.26	15.65	85.76	10.66	102.35	41.21
CoLk-11203	1.95	0.97	17.94	15.32	85.39	10.41	114.65	37.86
CoPb-11211	2.06	1.01	18.09	15.48	85.59	10.53	112.58	42.34
CoPb-1121	1.97	0.88	17.64	15.02	85.15	10.19	111.54	41.35
Mid late			(10 m)	(10 m)	(10 m)	(10 m)		
Co-11026	2.07	0.95	19.12	16.54	86.53	11.32	124.38	42.35
Co-11027	2.14	0.89	18.56	15.96	85.99	10.89	142.32	41.07
CoH-11263	2.12	0.93	18.53	15.93	86.01	10.86	134.24	45.32
CoH-11264	2.01	0.87	17.96	15.35	85.47	10.44	128.65	38.54
CoLk-11204	2.07	1.03	17.54	14.91	85.04	10.11	131.54	41.71
CoLk-11204	2.08	0.98	18.26	15.65	85.76	10.66	129.31	39.75
CoLk-11205	1.92	0.97	18.92	16.34	86.36	11.17	126.38	42.15
CoPb-11181	2.18	0.89	19.04	16.46	86.47	11.26	128.21	38.36
CoPb-11182	1.87	0.86	17.63	15.01	85.14	10.19	141.20	38.52
CoPb-11213	1.98	1.02	18.52	15.92	85.96	10.85	134.66	43.05
CoPb-11214	1.88	0.98	17.62	15.00	85.13	10.18	140.52	36.57
CoS11231	1.96	0.92	17.95	15.34	85.46	10.43	125.65	37.12
CoS-11232	2.05	0.89	17.59	14.96	85.04	10.15	140.39	42.71
Standards								
Early Maturity			(8m)	(8m)	(8m)	(8m)		
CoJ-64	1.89	0.95	17.65	15.03	85.16	10.20	112.15	37.59
CoPant-84211	1.86	0.93	17.98	15.37	85.49	10.45	115.21	42.85
Co-238	2.01	0.89	18.02	15.41	85.52	10.48	114.53	39.62
Mid late			(10 m)	(10 m)	(10 m)	(10 m)		
CoS-767	2.03	0.98	18.55	15.95	86.03	10.88	136.12	41.75
CoS-8436	2.14	0.88	17.69	15.07	85.20	10.23	128.34	40.65
Co Pant-97222	2.11	0.96	18.12	15.51	85.62	10.56	131.55	43.25