

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 crops 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. Rainfall 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 hectare farm areas, out of which about 40 ha area is under research block and remaining farm area use for seed multiplication of different crop varieties. 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 Agriculture Supervisor

6. Budget Position:

(In Rs)

Opening balance (2014-15)	Remittance by ICAR (2014-15)	Total fund ((2014-15)	Actual expenditure for the year	ICAR share 75%	State share 25%	Closing balance end of the year (March 31 th ,2015)
1*	2**	3	4	5	6	
(+) 8,45,559	32,48,000	40,93,559	41,07,547	30,80,660	10,26,887	(+) (+) 10,12,899

* Comptroller, MPUAT CA/KKG&Co/ICAR/13-14 dated 2.6.2014.

** vide AICRP (S) letter F.No.15-4/2014/PCS/ dt.21.5.2014.

* * vide AICRP (S) letter F.No.15-4/2014/PCS /dt.30.8.2014.

* * vide AICRP (S) letter F.No.15-4/2014/PCS/ dt.21.10.2014.

* * vide AICRP (S) letter F.No.15-4/2014/PCS/ dt.24.3.2015.

* * vide AICRP (S) letter F.No.15-4 /2014/PCS/ dt.31.3.2015.

ANNUAL REPORT
CROP IMPROVEMENT
(Year 2014-2015)

Expt. No. 1: Sugarcane / Breeding/ Kota / 2014-15/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** : 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) **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** : 04.03.2014
 - (ix) **Date of Harvesting** : 05.03.2015
7. **Results:**

The advance trial early maturity group comprising five test entries along with two standards. The variety CoPb-09181 exhibited highest cane yield (83.93 t/ha) and CCS (10.10 t/ha), closely followed by CoS-09246, which gave cane yield (79.00 t/ha) and CCS (8.47t/ha). The variety CoPb-09181 also showed highest germination (46.00 %), brix (20.07%), sucrose (17.52%), purity (87.31%), CCS (12.05%), extraction (53.33%), cane length (2.4m) cane diameter (2.5cm) and single cane weight (1.38kg) over all the varieties. The maximum number of cane tillers/ha was recorded for standard check varieties CoPant-84211 (137.42 thousand) closely followed by CoLk-09202 (136.4 thousand). The maximum number of malleable canes (*000/ha) was recorded for the variety CoLk-09202 (92.13) closely followed by CoS 09246 (88.97) and CoPb-09181 (87.13) and CoH 09263 (87.13). (**Table-1**)
8. **Significant findings** : Research in progress
9. **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 1: Advance Varietal Trial – Early (II Plant)- 2014-15

S. No	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10m)	NMC at 10m ('000/ha)
1	CoH 09262	8.59	75.37	19.20	16.63	86.61	11.39	51.07	87.03
2	CoH 09263	8.72	77.57	19.03	16.46	86.46	11.25	50.63	87.13
3	CoLk 09202	8.40	78.57	18.30	15.70	85.79	10.70	49.13	92.13
4	CoPb 09181	10.10	83.93	20.07	17.52	87.31	12.05	53.33	87.13
5	CoS 09246	8.47	79.00	18.33	15.74	85.83	10.73	50.10	88.97
	Standards								
1	CoJ 64	7.84	75.47	18.13	15.65	86.32	10.37	50.10	85.27
2	CoPant 84211	8.94	78.00	19.10	16.53	86.52	11.31	51.63	86.60
	CD	1.039	8.016	0.703	0.736	1.004	0.580	1.635	5.241
	CV	14.19	12.20	4.43	5.38	1.38	6.22	3.83	7.12

S. No	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (8 m)	Sucrose % (8 m)	Purity % (8 m)	CCS % (8 m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
1	CoH 09262	2.07	2.33	1.01	17.20	14.57	84.71	9.87	135.93	43.33
2	CoH 09263	2.07	2.00	1.04	18.20	15.60	85.71	10.63	129.07	45.33
3	CoLk 09202	1.87	2.02	1.18	17.23	14.60	84.33	9.89	136.40	39.67
4	CoPb 09181	2.40	2.50	1.38	18.63	16.05	86.12	10.96	135.57	46.00
5	CoS 09246	2.03	2.35	1.12	16.10	13.43	83.43	9.03	133.87	41.67
	Standards									
1	CoJ 64	1.78	2.08	0.93	16.17	13.50	83.52	9.08	134.67	42.00
2	CoPant 84211	1.90	2.15	1.15	17.53	14.91	85.05	10.12	137.43	36.33
	CD	0.129	0.146	0.097	0.459	0.472	0.552	0.348	5.989	4.586
	CV	7.59	7.88	10.35	3.16	3.84	0.78	4.17	5.30	13.00

Expt. No. 2 Sugarcane / Breeding/ Kota / 2014-15/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** : 3+2=5
 - (ii) **Treatments** : Co-10035 **Standards**
CoH-10261 CoJ-64
CoS-10231 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) **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** : 04.03.2014
 - (ix) **Date of Harvesting** : 03.03.2015
7. **Results:**

In this trial, the highest germination was recorded in the variety Co-10035 (44.67%) closely followed by standard check variety CoJ-64 (43.33%) and standard check variety CoS-10231 (43.00 %). The maximum number of cane tillers/ha was recorded in the variety CoS-10231 (142.63 thousand) closely followed by Co-10035 (138.63 thousand) and CoH 10261 (137.60 thousand), while, the maximum number of malleable canes ('000/ha) was recorded for the variety CoS-10231 (89.07) followed by CoJ-64 (84.90). The variety Co-10035 gives highest cane yield (80.47t/ha) followed by CoS-10231 (78.03) and CoPant 84211(78.00 t/ha), while CCS was maximum for Co-10035 (9.54 t/ha), closely followed by CoS-10231 (9.30t/ha). The Brix (21.50 %), Sucrose (17.86 %) and CCS (12.26%) were highest for the variety Co-10035, while extraction percentage was maximum for variety CoH-10261 (55.30%) at the time of harvest. (**Table-2**)
8. **Significant findings** : Research in progress
9. **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 2: Advance Varietal Trial – Early (I Plant)- 2014-15

S. No.	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10m)	NMC at 10m ('000/ha)
1	Co 10035	9.54	80.47	20.50	17.86	87.13	12.26	52.50	82.97
2	CoH 10261	8.82	77.43	19.77	17.21	87.08	11.82	55.30	82.60
3	CoS 10231	9.30	78.03	19.90	17.35	87.16	11.91	53.03	89.07
	Standards								
1	CoJ 64	8.54	73.83	19.57	17.01	86.65	11.67	53.43	84.90
2	CoPant 84211	8.74	78.00	18.50	15.91	85.98	11.19	53.93	82.70
	CD	0.928	5.659	0.529	0.601	0.959	0.620	2.472	4.219
	CV	17.24	12.17	4.49	5.87	1.84	8.78	7.69	8.33

S. No.	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (8 m)	Sucrose % (8 m)	Purity % (8 m)	CCS % (8 m)	No. of tillers ('000/ha) 120 days	Germination % (45days)
1	Co 10035	2.45	2.16	0.78	19.17	16.59	86.55	11.36	138.63	44.67
2	CoH 10261	2.25	2.30	1.00	18.17	15.56	85.67	10.60	137.60	39.67
3	CoS 10231	2.17	2.02	0.97	18.10	15.49	85.58	10.60	142.63	43.00
	Standards									
1	CoJ 64	2.03	2.03	0.76	17.63	15.01	85.11	10.19	132.83	43.33
2	CoPant 84211	2.30	2.30	0.82	17.90	15.29	85.41	10.39	136.73	39.33
	CD	0.116	0.127	0.055	0.774	0.797	0.749	0.620	6.143	2.632
	CV	8.61	9.79	10.68	7.09	8.53	1.46	9.73	7.44	10.45

Expt. No. 3: Sugarcane / Breeding/ Kota / 2014-15/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** : 7+2=9
 - (ii) **Treatments** : CoH 11261 Standards
CoH 11262 CoJ-64
CoLk 11201 Co 0238
CoLk 11202
CoLk 11203
CoPb 11211
CoPb 11212
 - (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** : 07.03.2014
 - (ix) **Date of Harvesting** : 06.03.2015
7. **Results:**

This early maturing trial comprising seven entries along with two standard checks. The variety CoH 11261 gave highest cane yield (85.43t/ha) followed by CoPb 11212 (77.10t/ha), while CCS was maximum for CoLk 11203 (8.80 t/ha), closely followed by CoLk 11201 (8.55). The maximum number of cane tillers/ha was recorded in the standard check varieties Co 0238 (119.60 thousand) closely followed by CoJ 64 (116.57 thousand) and CoLk 11202 (114.87 thousand). But, the maximum number of malleable canes ('000/ha) was recorded for the variety CoH 11262 (91.50) followed by Co 0238 (91.27). The variety CoLk 11203 exhibited highest Brix (19.43%), Sucrose (16.83%), Purity (86.63%) and CCS (11.53%), while extraction percentage was maximum for variety CoH 11261 (53.87%) at the time of harvest. The highest germination was recorded in variety CoH 11261 (43.33%) followed by variety Co 0238 (43.00%) and CoLk 11203 (42.67 %). (Table-3)
8. **Significant findings** : Research in progress
9. **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 3: Initial Varietal Trial – Early- 2014-15

S. No	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10m)	NMC at 10m ('000/ha)
1	CoH 11261	7.74	85.43	16.20	13.50	83.30	9.07	53.87	82.80
2	CoH 11262	7.67	73.80	17.90	15.30	85.47	10.40	52.90	91.50
3	CoLk 11201	8.55	76.17	19.20	16.60	86.47	11.36	52.27	79.57
4	CoLk 11202	8.23	74.87	18.50	15.90	85.97	10.85	52.43	78.67
5	CoLk 11203	8.80	76.40	19.43	16.83	86.63	11.53	52.40	84.27
6	CoPb 11211	7.78	72.20	18.40	15.80	85.87	10.77	50.60	76.13
7	CoPb 11212	8.29	77.10	18.37	15.77	85.83	10.75	50.50	70.73
	Standards								
1	CoJ 64	7.23	70.73	17.63	15.03	85.20	10.21	52.23	83.87
2	Co 0238	8.04	74.97	18.33	15.73	85.80	10.73	53.03	91.27
	CD	0.858	7.966	0.468	0.367	0.381	0.342	1.990	6.483
	CV	9.90	9.75	2.38	2.18	0.41	2.98	3.53	7.32

S. No	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (8 m)	Sucrose % (8 m)	Purity % (8 m)	CCS % (8 m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
1	CoH 11261	1.99	1.95	0.82	15.13	12.43	82.13	8.19	113.40	43.33
2	CoH 11262	1.72	2.08	1.10	15.63	12.93	82.73	8.65	112.53	41.00
3	CoLk 11201	1.83	1.85	0.86	17.50	14.90	85.13	10.11	108.07	38.00
4	CoLk 11202	1.97	2.01	0.86	17.77	15.17	85.37	10.32	114.87	40.00
5	CoLk 11203	2.10	2.10	0.79	17.83	15.23	85.43	10.36	109.03	42.67
6	CoPb 11211	2.08	1.90	0.83	16.60	13.90	83.70	9.36	109.83	40.33
7	CoPb 11212	1.73	1.95	0.84	15.83	13.13	82.93	8.79	112.73	39.33
	Standards									
1	CoJ 64	1.97	1.92	0.81	16.20	13.50	83.20	9.07	116.57	34.33
2	Co 0238	1.80	1.98	0.84	17.23	14.63	84.93	9.59	119.60	43.00
	CD	0.153	0.079	0.045	0.487	0.487	0.489	0.525	4.830	2.795
	CV	7.41	3.72	4.83	2.71	3.23	0.54	5.19	3.96	6.44

Expt. No. 4: Sugarcane / Breeding/ Kota / 2014-15/Spring-4

1. **Name of project** : AICRP on Sugarcane
2. **Zone/Location** : North West Zone
Agriculture Research Station Ummedganj, 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** : 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) **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** : 03.03.2014
 - (ix) **Date of Harvesting** : 04.03.2015
7. **Results:**

In this trial, the average germination was ranged from 41.00% to 43.33%. The maximum number of cane tillers per hectare was recorded for variety CoS 09232 (119.60 thousands) followed by CoH-09264 (119.13 thousands) and CoLk-09204 (116.63 thousands). The maximum number of malleable canes ('000/ha) was recorded in the variety Co- 09022 (85.60) followed by CoPb 09214 (85.10). The highest cane yield was recorded for the variety CoLk 09204 (83.37t/ha), while CCS was highest for variety Co- 09022 (9.90 t/ha). The variety Co-09022 and CoH 09264 possessed highest estimates of Brix (20.33%) and Sucrose (17.80%) and CCS (12.25%) at harvest. But the extraction percentage was maximum for the variety CoLk-09204 (57.47%). The average length (2.62m) and diameter (2.42 cm) of cane was highest Co-09022 and CoH-09264 but single can weight was maximum for CoH-09264 (1.08kg). (**Table-5**).
8. **Significant findings** : Research in progress
9. **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 4: Advance Varietal Trial - Midlate (II Plant)- 2014-15

S. No	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (12 m)	Sucrose % (12 m)	Purity % (12 m)	CCS % (12 m)	Extraction % (12 m)	NMC at 12 m ('000/ha)
1	Co 09022	9.90	80.83	20.33	17.80	87.19	12.25	55.33	85.60
2	CoH 09264	9.72	79.23	20.33	17.80	87.55	12.26	53.23	75.93
3	CoLk 09204	9.81	83.37	20.30	17.76	87.50	12.15	57.47	77.90
4	CoPb 09214	8.97	81.13	18.77	16.18	86.21	10.39	54.80	85.10
5	CoS 09232	9.60	80.87	19.83	17.28	87.14	11.97	55.17	76.97
	Standards								
1	CoS 767	10.14	82.20	19.90	17.35	87.18	11.68	53.87	79.83
2	CoS 8436	9.06	76.13	19.33	16.77	86.72	11.92	55.47	78.37
3	CoPant 97222	9.57	78.37	20.27	17.73	87.48	12.20	53.43	73.17
	CD	1.291	5.558	0.615	0.632	0.592	0.554	1.640	5.448
	CV	14.02	7.22	3.22	3.80	0.71	4.88	3.12	7.18

S. No	Clone	Stalk Length (cm)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
1	Co 09022	2.62	2.42	0.86	17.53	14.91	85.04	10.06	108.60	39.67
2	CoH 09264	2.62	2.42	1.08	18.20	15.60	85.71	10.63	119.13	42.67
3	CoLk 09204	2.42	2.08	0.91	18.10	15.49	85.59	10.55	116.63	43.33
4	CoPb 09214	2.30	1.80	0.85	16.63	13.98	84.07	9.43	111.87	43.33
5	CoS 09232	2.43	2.48	0.85	17.10	14.46	84.58	9.79	119.60	42.33
	Standards									
1	CoS 767	2.52	2.60	0.83	17.23	14.60	84.74	9.87	114.43	39.33
2	CoS 8436	2.38	2.22	0.80	17.00	14.36	84.48	9.70	109.60	43.33
3	CoPant 97222	2.22	2.08	0.89	17.90	15.19	85.40	10.40	113.60	41.00
	CD	0.156	0.189	0.070	0.567	0.579	0.610	0.447	4.809	3.325
	CV	6.66	8.71	8.24	3.38	4.07	0.75	4.63	4.39	8.28

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-10036	Standards
CoH-10262	CoS-767
CoPant-10211	CoS-8436
CoPb-10181	Co Pant-97222
CoPb-10182	
 - (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** : 03.03.2014
 - (ix) **Date of Harvesting** : 08.03.2015
7. **Results** :

Among the test entries in this trial, the highest cane yield was recorded for the variety CoH 10262 (84.67t/ha) followed by CoPant 97222 (83.63 t/ha) and Co 10036 (82.70t/ha), while maximum CCS exhibited by CoH 10262 (10.18 t/ha) followed by Co 10036 (9.87 t/ha) and standard CoPant-97222 (9.80 t/ha). The maximum and minimum number of cane tillers/ha was recorded in the variety CoH 10262 (138.40 thousands) and Co 10036 (118.80 thousands), respectively. But the maximum number of malleable canes ('000/ha) was recorded in standard check variety CoS 8436 (86.40) followed by CoPant 10221 (85.57). At harvest, variety CoPant 10221exhibited highest Brix (20.17%), Sucrose (17.63%), Purity (87.40%), CCS (12.13%), very closely followed by CoH 10262 [Brix (20.03%), Sucrose (17.49%), Purity (87.29%), CCS (12.02%)]. The maximum germination was recorded in the variety CoPb-10182 (50.00%) followed by variety CoPb 10181 (48.67%). (**Table-6**)
8. **Significant findings** : Research in progress
9. **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 5: Advance Varietal Trial - Midlate (I Plant)- 2014-15

S. No.	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (12 m)	Sucrose % (12 m)	Purity % (12 m)	CCS % (12 m)	Extraction % (12 m)	NMC at 12 m ('000/ha)
1	Co 10036	9.87	82.70	19.93	17.38	87.21	11.94	53.93	84.60
2	CoH 10262	10.18	84.67	20.03	17.49	87.29	12.02	54.50	83.27
3	CoPant10221	9.50	78.37	20.17	17.63	87.40	12.13	54.60	85.57
4	CoPb 10181	9.22	81.10	19.17	16.60	86.59	11.36	55.80	76.63
5	CoPb 10182	9.71	82.67	19.67	17.11	87.01	11.75	54.47	83.07
	Standards								
1	CoS 767	9.30	81.80	19.20	16.63	86.60	11.39	52.50	81.13
2	CoS 8436	9.49	81.47	19.53	16.97	86.89	11.64	56.40	86.40
3	CoPant 97222	9.80	83.63	19.63	17.08	86.95	11.72	54.73	85.00
	CD	0.797	7.044	0.662	0.682	0.553	0.505	1.702	4.425
	CV	8.63	8.95	3.51	4.16	0.66	4.48	3.25	5.55

S. No.	Clone	Stalk Length (cm)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10m)	CCS % (10 m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
1	Co 10036	2.36	2.00	0.89	17.57	14.95	85.08	10.15	118.80	46.67
2	CoH 10262	2.59	2.53	0.95	18.27	15.67	85.76	10.34	138.40	46.67
3	CoPant10221	2.32	2.37	0.98	17.37	14.74	84.87	9.99	134.97	44.33
4	CoPb 10181	2.27	2.17	1.13	18.53	15.94	86.01	10.88	127.33	48.67
5	CoPb 10182	1.95	2.33	1.00	18.67	16.08	86.24	10.98	128.47	50.00
	Standards									
1	CoS 767	2.07	2.20	1.09	17.63	15.01	85.14	10.19	121.30	44.67
2	CoS 8436	2.44	2.10	1.10	18.23	15.63	85.74	10.65	120.93	44.67
3	CoPant 97222	2.40	2.33	1.06	18.40	15.80	85.88	10.78	123.03	43.33
	CD	0.194	0.206	0.094	0.555	0.572	0.590	0.438	5.014	3.729
	CV	8.79	9.51	9.55	3.20	3.85	0.72	4.35	4.13	8.43

Expt. No. 6: Sugarcane / Breeding/ Kota / 2014-15/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** : **13+3=18**
 - (ii) **Treatments** :

Co 11026	Standards
Co 11027	CoS-767
CoH 11263	CoS-8436
CoH 11264	Co Pant-97222
CoLk 11204	
CoLk 11205	
CoLk 11206	
CoPb 11181	
CoPb 11182	
CoPb 11213	
CoPb 11214	
CoS 11231	
CoS 11232	
 - (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** : 04.03.2014
 - (ix) **Date of Harvesting** : 07.03.2015
7. **Results** :

In this trial, the highest cane yield was recorded for the variety CoS 11231 (88.37t/ha) followed by CoPb 11182 (85.13t/ha) and CoS 11232 (85.00t/ha), while maximum CCS exhibited by CoH 11263 (9.95 t/ha) followed by CoS 8436 (9.78 t/ha) and CoS 11231 (9.74 t/ha). The maximum number of cane tillers/ha was recorded in the variety CoPant-97222 (118.57 thousands) closely followed by CoLk 11206 (117.70 thousand) and CoLk 11205 (117.23 thousands), while the maximum number of malleable canes ('000/ha) was recorded in the variety Co 11026 (84.40) followed by Co 11027 (83.87). At harvest, the Brix (20.37%), Sucrose (17.64%), Purity (87.58%), CCS (12.29%) was highest for the variety CoH 11263, very closely followed by Co 11027 [Brix (19.93%), Sucrose (17.39%), Purity (87.29%), CCS (11.95%)]. The maximum germination was recorded in the varieties CoPb-11182 and CoPb 11183 (46.33%). (**Table-6**)
8. **Significant findings** : Research in progress
9. **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 6: Initial Varietal Trial -Midlate - 2014-15

S. No	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (12 m)	Sucrose % (12 m)	Purity % (12 m)	CCS % (12 m)	Extraction % (12 m)	NMC at 12m ('000/ha)
1	Co 11026	9.17	78.80	19.77	17.22	87.10	11.65	47.07	84.40
2	Co 11027	9.52	79.87	19.93	17.39	87.29	11.95	41.40	83.87
3	CoH 11263	9.95	80.97	20.37	17.64	87.58	12.29	44.77	82.70
4	CoH 11264	9.45	80.03	19.90	17.35	87.18	11.83	50.30	77.10
5	CoLk 11204	8.87	78.73	19.03	16.46	86.29	11.26	47.33	75.20
6	CoLk 11205	8.83	77.73	19.20	16.59	86.57	11.36	43.43	76.27
7	CoLk 11206	7.37	72.37	17.60	14.98	85.11	10.17	45.90	74.93
8	CoPb 11181	7.76	74.87	17.83	15.22	85.36	10.35	42.20	73.73
9	CoPb 11182	9.08	85.13	18.27	15.67	85.76	10.68	40.80	72.60
10	CoPb 11213	9.51	84.80	18.47	15.87	85.94	10.82	42.93	75.87
11	CoPb 11214	9.16	79.47	18.27	15.67	85.77	10.68	43.63	71.50
12	CoS 11231	9.74	88.37	19.50	16.94	86.87	11.20	45.37	73.80
13	CoS 11232	9.56	85.00	18.83	16.25	86.30	11.25	44.67	74.60
	Standards								
1	CoS 767	9.10	78.73	19.43	16.87	86.80	11.57	48.67	75.87
2	CoS 8436	9.78	81.57	19.90	17.35	87.20	11.99	48.27	75.53
3	CoPant 97222	9.50	80.10	19.87	17.32	87.16	11.85	46.97	50.30
	CD	0.941	8.328	0.515	0.549	0.460	0.559	3.047	18.444
	CV	5.36	5.40	1.40	1.73	0.28	2.58	3.51	12.84

S. No	Clone	Stalk Length (cm)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
1	Co 11026	2.38	2.35	0.72	17.73	16.12	85.24	10.27	111.17	43.67
2	Co 11027	2.33	2.32	0.79	16.80	14.15	84.24	9.56	112.90	45.33
3	CoH 11263	2.08	2.43	0.71	17.63	15.02	85.16	10.20	110.23	41.67
4	CoH 11264	1.78	2.08	0.78	17.50	14.88	85.41	10.09	112.83	41.33
5	CoLk 11204	1.93	2.43	0.75	16.23	13.57	83.61	9.13	115.83	41.67
6	CoLk 11205	2.08	2.35	0.74	15.97	13.30	83.27	8.89	117.23	43.33
7	CoLk 11206	2.43	2.03	0.79	16.07	13.40	83.39	8.95	117.70	45.67
8	CoPb 11181	2.35	2.12	0.73	16.20	13.54	83.55	9.36	113.87	41.33
9	CoPb 11182	2.03	2.05	0.71	17.23	14.54	84.74	10.17	106.50	46.33
10	CoPb 11213	2.32	2.17	0.78	17.80	15.19	85.34	9.77	109.10	46.33
11	CoPb 11214	2.35	2.40	0.81	15.83	13.16	83.09	8.83	105.60	43.33
12	CoS 11231	2.58	2.23	0.94	16.53	13.88	83.92	9.34	110.40	45.33
13	CoS 11232	2.52	2.35	0.83	15.90	13.23	83.20	8.88	103.07	43.33
	Standards									
1	CoS 767	2.52	2.18	0.68	17.80	15.19	85.32	10.32	111.27	42.33
2	CoS 8436	2.33	2.08	0.79	17.90	15.29	85.04	10.40	111.07	43.67
3	CoPant 97222	2.45	2.28	0.75	18.33	15.73	85.82	10.87	118.57	45.33
	CD	0.136	0.161	0.052	0.457	0.842	0.582	0.388	5.086	4.038
	CV	3.10	3.75	3.54	1.40	3.05	0.36	2.09	2.37	4.81

Expt. No. 7: Sugarcane / Breeding/ Kota / 2014-15/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-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** : 10+2=12
- (ii) **Treatments** : Co-12026 **Standards**
Co-12027 CoJ-64
CoH 12261 Co-238
CoLk 12201
CoLk 12202
CoLk 12203
CoLk 12204
CoPant12221
CoPant12222
CoS- 12231
- (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** : 19.03.2014
(ix) **Date of Harvesting** : 09.03.2015
6. **Results:**
Among 12 entries in this trial, variety CoH 12261 exhibited highest cane yield (81.4t/ha) along with highest CCS (9.57 t/ha) followed by CoPant 12222 (79.5 t/ha). The maximum number of cane tillers/ha was recorded in variety CoLk 12204 (117.4) followed by standard check variety Co 0238 (116.6), while the maximum number of malleable canes ('000/ha) was recorded for standard check variety CoJ 64 (89.60 thousand) followed CoLk 12201 (89.10 thousand). The Brix (20.5%) and Sucrose (117.97%), Purity (87.66%), CCS (12.38%) were highest for the variety Co-12027 followed by Co-12026 (20.49%), (117.76%) (87.49%) and (12.22%), respectively, while extraction percentage was maximum for variety Co 0238 (52.8%) at the time of harvest. The maximum germination was recorded in the variety CoPant 12222 (45.00 %) followed by Co 0238 (44.00%). **(Table-7)**
- 7 **Significant findings** : Research in progress
8 **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 7: Zonal Varietal Trial-Early –2014-15

S. No	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (10 m)	Sucrose % (10m)	Purity % (10m)	CCS % (10m)	Extraction % (10m)	NMC at 10m ('000/ha)
1	Co-12026	9.47	77.5	20.3	17.76	87.49	12.22	52.3	87.5
2	Co-12027	8.95	72.3	20.5	17.97	87.66	12.38	52.5	83.4
3	CoH 12261	9.57	81.4	19.7	17.14	87.01	11.76	51.7	85.4
4	CoLk 12201	7.22	79.3	16.2	13.54	83.58	9.11	49.8	89.1
5	CoLk 12202	8.24	75.9	18.5	15.91	86.00	10.86	47.8	81.9
6	CoLk 12203	8.46	75.3	19.0	16.42	86.42	11.23	51.5	83.5
7	CoLk 12204	8.78	78.7	18.9	16.32	86.35	11.16	46.9	86.1
8.	CoPant12221	8.27	72.6	19.2	16.63	86.61	11.39	50.4	84.3
9.	CoPant 12222	9.35	79.5	19.7	17.14	87.01	11.76	51.5	87.2
10.	CoS12231	8.58	74.8	19.3	16.73	86.68	11.47	50.7	85.3
	Standards								
1	CoJ 64	7.90	73.8	18.3	15.70	85.79	10.70	51.6	89.6
2	Co 0238	8.77	75.9	19.4	16.84	86.78	11.55	52.8	87.9

S. No.	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (8 m)	Sucrose % (8 m)	Purity % (8 m)	CCS % (8 m)	No. of tillers ('000/ha) 120 days	Germination % (45 days)
1	Co-12026	2.15	2.10	0.80	17.6	14.98	85.11	10.17	109.9	41
2	Co-12027	2.11	2.15	0.74	17.4	14.77	84.89	10.01	113.7	42
3	CoH 12261	1.97	1.90	0.78	15.9	13.23	83.21	8.88	110.5	39
4	CoLk 12201	2.11	1.95	0.66	15.7	13.02	82.93	8.72	108.6	36
5	CoLk 12202	1.90	2.00	0.71	15.3	12.61	82.42	8.42	109.3	38
6	CoLk 12203	1.95	2.10	0.84	15.4	12.71	82.53	8.49	112.5	41
7	CoLk 12204	1.87	1.95	0.61	15.1	12.40	82.12	8.26	117.4	35
8.	CoPant12221	1.92	1.90	0.80	16.8	14.15	84.23	9.56	113.6	36
9.	CoPant 12222	2.15	2.00	0.81	15.5	12.81	82.64	8.57	112.8	45
10.	CoS- 12231	2.20	2.10	0.87	16.7	14.05	84.13	9.48	103.5	32
	Standards									
1	CoJ 64	2.16	2.20	0.88	16.8	14.15	84.23	9.56	115.2	43
2	Co 0238	2.23	2.15	0.82	17.5	14.87	84.97	10.09	116.6	44

Expt. No. 8: Sugarcane / Breeding/ Kota / 2014-15/Spring-8

- 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-Early
- 4 **Year of start** : Continue
- 5 **Objective:** : To identify a promising medium duration variety having better tonnage and sucrose than the existing varieties for the zone
- 6 **Brief description of the experiment:**
- (i) **No. of Entries** : **15+3=18**
- (ii) **Treatments** : Co 12028 **Standards**
Co 12029 CoS-767
CoH 12262 CoS-8436
CoH 12263 Co Pant-97222
CoLk 12205
CoLk 12206
CoPant 12223
CoPant 12224
CoPant 12225
CoPant 12226
CoPb 12181
CoPb 12182
CoPb 12211
CoPb 12212
CoS 12232
- (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** : 19.03.2014
- (ix) **Date of Harvesting** : 09.03.2015
6. **Results:**
- The variety CoPb 12181 exhibited highest cane yield (85.4t/ha) along with highest CCS (10.49 t/ha) closely followed by CoPant 12226 (84.3t/ha) and (10.36 t/ha), respectively. The maximum number of cane tillers/ha was recorded in variety CoLk 12205 (121.4 thousand) followed CoPb 12182 (120.4 thousand) and CoLk 12206 (120.3 thousand), while the maximum number of malleable canes ('000/ha) was recorded for variety CoLk 12206 (83.1) followed by CoPant 12226 (82.6). At the time of harvest Brix (20.6%) and Sucrose (18.07) were highest for variety CoPb 12182 followed by CoPb 12181 (20.4%) and (17.86%) and CoPant 12226 (20.4%) and (17.86%), respectively, while extraction percentage was maximum for variety CoPant 12224 (46.3%) at harvest. The maximum germination was recorded in the variety CoPb 12182 (46 %). The variety CoPb 12182 possessed longest canes (2.40 m), variety CoS 767 (2.4 cm) had thickest canes. **(Table-8)**
- 7 **Significant findings** : Research in progress
- 8 **Scientist attached** : Dr. P. Kumar, Sugarcane Breeder

Table 8: Zonal Varietal Trial-Midlate –2014-15

S. No	Clone	CCS (t/ha)	Cane yield (t/ha)	Brix % (12 m)	Sucrose % (12 m)	Purity % (12 m)	CCS % (12 m)	Extraction % (12 m)	NMC at 12 m ('000/ha)
1	Co 12028	8.44	79.5	18.2	15.59	85.66	10.62	45.3	82.6
2	Co 12029	7.58	72.9	17.9	15.29	85.42	10.40	47.1	84.3
3	CoH 12262	8.80	73.4	20.0	17.45	87.25	11.99	43.2	79.6
4	CoH 12263	9.85	81.5	20.1	17.57	87.41	12.09	39.9	77.9
5	CoLk 12205	9.40	81.4	19.4	16.84	86.80	11.55	43.3	81.7
6	CoLk 12206	9.64	80.9	19.9	17.35	87.18	11.92	45.4	83.1
7	CoPant 12223	9.18	78.5	19.6	17.04	86.94	11.69	43.5	78.5
8	CoPant 12224	8.99	73.6	20.1	17.57	87.41	12.23	46.3	76.4
9	CoPant 12225	7.36	75.8	17.6	14.98	82.56	10.77	42.5	75.8
10	CoPant 12226	10.36	84.3	20.4	17.86	88.27	12.29	43.8	82.6
11	CoPb 12181	10.49	85.4	20.4	17.86	87.55	12.29	44.0	80.4
12	CoPb 12182	9.50	81.5	20.6	18.07	87.72	11.66	43.5	77.7
13	CoPb 12211	9.69	83.4	19.5	16.94	86.87	11.62	49.5	72.8
14	CoPb 12212	8.99	83.5	18.4	15.80	85.87	10.77	43.9	76.6
15	CoS 12232	8.84	81.4	18.5	15.91	86.00	10.86	44.7	73.9
	Standards								
1	CoS 767	8.64	82.6	18.4	15.80	85.87	10.77	45.9	81.2
2	CoS 8436	9.40	82.0	19.3	16.73	86.68	11.46	43.4	80.7
3	CoPant 97222	9.06	81.2	18.9	16.32	86.35	11.16	45.6	81.4

S. No	Clone	Stalk Length (cm)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10m)	CCS % (10 m)	No. of tillers ('000/ha) 120 days	Germination % (45days)
1	Co 12028	1.95	2.14	0.84	16.1	13.43	88.34	9.02	112.3	39
2	Co 12029	1.87	2.37	0.82	15.4	12.24	79.48	8.01	113.5	37
3	CoH 12262	2.05	2.11	0.84	16.4	13.74	83.78	9.25	109.8	42
4	CoH 12263	2.00	2.15	0.62	17.1	14.46	84.56	9.78	114.2	38
5	CoLk 12205	2.15	2.31	0.73	15.9	13.23	83.21	8.88	121.4	43
6	CoLk 12206	2.17	2.38	0.64	15.8	13.12	83.04	8.79	120.3	45
7	CoPant 12223	2.05	2.17	0.83	14.7	11.99	81.56	7.96	113.8	42
8	CoPant 12224	2.11	2.20	0.86	18.3	15.70	85.79	10.70	115.6	40
9	CoPant 12225	2.30	2.10	0.68	14.5	11.78	81.24	7.81	118.4	39
10	CoPant 12226	2.26	1.95	0.83	15.6	12.92	82.82	8.65	110.8	42
11	CoPb 12181	2.20	1.90	0.69	16.2	13.54	83.58	9.11	119.6	45
12	CoPb 12182	2.40	2.10	0.78	16.5	13.85	83.94	9.34	120.4	46
13	CoPb 12211	2.35	2.15	0.81	14.6	11.89	81.44	7.89	107.9	34
14	CoPb 12212	2.10	2.30	0.83	13.9	11.16	80.29	7.35	109.8	37
15	CoS 12232	2.01	2.16	0.79	16.5	13.85	83.94	9.34	113.4	35
	Standards									
1	CoS 767	2.16	2.40	0.85	17.6	14.98	82.82	10.17	114.5	45
2	CoS 8436	2.25	2.20	0.81	15.9	13.23	85.28	8.87	117.4	39
3	CoPant 97222	2.20	2.25	0.83	16.5	13.85	83.94	9.34	119.1	41

