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KERALA AGRICULTURAL UNIVERSITY
Sugarcane Research Station, Kallungal .P.O., Thiruvalla 689 102

No. SRS II/287/07

Dated:14.06.2012

From,

Professor and Head

To,

Dr. O.K.Sinha,
Project Coordinator,
AICRP on Sugarcane,
Indian Institute of Sugarcane Research,
LUCKNOW- 226 002, U.P.

Sir,

Sub:- KAU-SRS- Thiruvalla- AICRP on Sugarcane – Annual report 2012-13-reg

I am forwarding herewith the Annual Report of the AICRP (S) (Crop Improvement, Crop Production and Plant Pathology) experiments conducted at this station for the year 2012 -13 for necessary action. The reports of Crop Improvement, Crop Production and Plant Pathology have been already sent to the respective PIs. This is for favour of your kind information.

Yours faithfully

Sd/-

Professor and Head

KERALA AGRICULTURAL UNIVERSITY



AICRP ON SUGARCANE

Annual Report
2012 – 2013

Sugarcane Research Station, Kallungal
Thiruvalla, Kerala – 689102

Staff Position

Discipline	Post/ Designation	Number of sanctioned post	Name of the incumbent	Remarks
Plant Breeding	Assistant Professor	1	Dr. Beena Thomas	Up to 31-1- 2013
	Associate Professor		Dr. Shajan, V.R.	Up to 01-02- 2013
Plant Pathology	Assistant Professor	1	Dr. Sajeena	-
Agronomy	Assistant Professor		Smt.Bindhu.J.S.	-
	1. Farm Officer. Gr.II	1	Vacant	Vacant
	2. Lab. Assistant	1	Vacant	Vacant
	3. Technical Officer Gr.II	1	Vacant	Vacant

Crop Improvement

KERALA AGRICULTURAL UNIVERSITY
Sugarcane Research Station
All India Coordinated Research Project on Sugarcane

Annual Report 2012-2013

- 1. Title** : Initial Varietal Trial – Early
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)
- 4. Technical Programme** :
- Entries (8) : Co 09002, Co 09003, Co 09004, Co 09005, Co 09006,
Co 09007, CoN 09071 and CoN 09072
 - Standards (3) : CoC 671, Co 94008 and Co 85004
 - Design : Randomised Block Design
 - Replications : Three
 - Plot size : Gross: 6m x 6r x 0.9m
: Net: 5m x 4r x 0.9m
 - Seed rate : 12 buds per metre
 - Crop duration : 10 months

5. Results:

- CCS t/ha: Clone Co 09002 recorded highest CCS of 12.17 t/ha followed by CoN 09071(11.18 t/ha) and CoN 09072 (11.15 t/ha) and significantly superior to all other entries and standards
- Yield t/ha: Clone Co 09002 recorded highest yield of 94.07 t/ha followed by CoN 09071(89.38 t/ha) and CoN 09072 (87.04 t/ha) and significantly superior to all other entries and standards
- Brix % : Standard CoC 671 recorded highest Brix of 21.13 % followed by Co 09002 (20.33 %) and significantly superior to all other entries and other standards
- Sucrose %: Standard CoC 671 recorded highest sucrose of 19.29 % and significantly superior to all the entries and other standards
- CCS %: Standard CoC 671 recorded highest CCS of 13.55 % and significantly superior to all the entries and other standards

Sd/-

Signature of the Principal Investigator

1. Initial Varietal Trial (Early)

2.

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	Pol % cane (10 m)	Extraction % (10 m)	Fibre % (10 m)	NMC at 10 m ('000/ha)
1	Co 09002	12.17	94.07	20.33	18.47	90.06	12.94		62.06		99.63
2	Co 09003	9.35	74.94	19.60	17.80	90.02	12.47		59.10		84.81
3	Co 09004	8.41	70.24	18.57	16.99	90.60	11.94		61.60		74.57
4	Co 09005	8.35	73.33	17.83	16.23	90.14	11.38		64.35		61.48
5	Co 09006	7.69	59.75	20.10	18.33	90.39	12.86		58.18		87.78
6	Co 09007	8.72	76.67	17.87	16.24	89.99	11.38		58.42		66.42
7	CoN 09071	11.18	89.38	19.50	17.81	90.50	12.51		62.38		105.93
8	CoN 09072	11.15	87.04	20.03	18.26	90.32	12.81		57.90		86.30
Stds											
1	CoC 671	10.69	78.89	21.13	19.29	90.53	13.55		60.24		85.18
2	Co 94008	9.44	84.57	17.50	15.92	90.08	11.16		59.34		63.58
3	Co 85004	9.06	72.72	19.53	17.73	89.91	12.41		53.13		82.35
	CD (0.05 %)	0.111	7.078	0.809	0.703	NS	0.496		5.398		8.842
	CV	7.02	5.5100	2.56	2.44	0.74	2.46		5.51		6.60

Initial Varietal Trial (Early) (Cont.....)

Sl. 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 shoots ('000/ha) 240 days	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 09002	2.26	2.94	1.500	15.80	13.90	87.00	9.60	100.25	102.22	56.44
2	Co 09003	2.18	2.89	1.456	15.60	13.75	87.17	9.50	81.23	83.58	56.45
3	Co 09004	2.41	2.98	1.572	14.60	12.91	87.34	8.93	75.68	78.40	50.89
4	Co 09005	1.80	2.83	1.205	14.73	13.06	87.60	9.05	47.29	49.88	35.19
5	Co 09006	2.15	3.15	1.556	15.87	13.91	86.69	9.58	84.07	86.17	57.63
6	Co 09007	2.33	3.16	1.750	13.83	12.21	87.13	8.44	64.69	66.79	42.15
7	CoN 09071	2.31	2.74	1.378	14.97	13.13	86.70	9.05	94.69	98.39	49.26
8	CoN 09072	2.25	2.54	1.289	16.70	14.68	86.98	10.13	82.84	86.29	54.15
Stds											
1	CoC 671	2.19	3.10	1.561	18.10	15.97	87.37	11.04	76.54	79.88	43.26
2	Co 94008	2.42	2.86	1.455	15.17	13.37	87.11	9.24	62.59	65.68	44.67
3	Co 85004	1.95	2.75	1.389	16.80	14.75	86.90	10.17	88.15	90.25	53.55
	CD (0.05 %)	0.212	0.166	0.097	0.718	0.619	NS	0.443	6.675	6.901	6.812
	CV	5.86	3.49	4.05	2.80	2.74	0.91	2.83	5.21	5.210	8.40

KERALA AGRICULTURAL UNIVERSITY
Sugarcane Research Station
All India Coordinated Research Project on Sugarcane

Annual Report 2012-2013

- 1. Title** : Advanced Varietal Trial (Early) – I Plant
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)

4. Technical Programme :

- Entries (2) : Co 08001 and VSI 08121
- Standards (3) : CoC 671, Co 94008 and Co 85004
- Design : Randomised Block Design
- Replications : Four
- Plot size : Gross: 6m x 8r x 0.9m
: Net: 5m x 6r x 0.9m
- Seed rate : 12 buds per metre
- Crop duration : 10 months

5. Results:

- CCS t/ha: Standard Co 85004 recorded highest CCS of 11.44 t/ha and significantly superior to all the entries and other standards
- Yield t/ha: Standard Co 85004 recorded highest yield of 85.28 t/ha and significantly superior to all the entries and other standards
- Brix % : Standard CoC 671 recorded highest Brix of 21.80 % followed by VSI 08121 (21.25 %) and significantly superior to all other entries and other standards
- Sucrose %: Standard CoC 671 recorded highest sucrose of 19.82 % followed by VSI 08121 (19.32 %) and significantly superior to all other entries and other standards
- CCS %: Standard CoC 671 recorded highest CCS of 13.89 % followed by VSI 08121 (13.54 %) and significantly superior to all the entries and other standards

Sd/-

Signature of the Principal Investigator

2. Advanced Varietal Trial (Early I Plant)

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	Pol % cane (10 m)	Extraction % (10 m)	Fibre % (10m)	NMC at 10 m ('000/ha)
1	Co 08001	8.15	66.80	19.05	17.38	90.36	12.20		61.83		61.32
2	VSI 08121	7.95	58.68	21.25	19.32	90.14	13.54		59.01		66.74
Std											
1	CoC 671	9.76	70.28	21.80	19.82	90.16	13.89		63.48		80.97
2	Co 94008	8.81	75.21	18.35	16.70	90.13	11.71		58.96		66.94
3	Co 85004	11.44	85.28	20.95	19.11	90.44	13.41		60.72		92.01
	CD (0.05 %)	0.993	6.768	0.715	0.598	NS	0.415		NS		8.247
	CV	7.58	6.68	2.48	2.28	0.63	2.25		4.76		7.88

Sl. 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 shoots ('000/ha) 240 days	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 08001	2.31	3.11	1.504	13.98	12.30	86.89	8.49	64.93	68.40	57.67
2	VSI 08121	2.21	2.91	1.266	15.70	13.82	87.02	9.54	74.86	83.06	56.46
Std											
1	CoC 671	2.35	3.01	1.596	16.70	14.68	86.98	10.13	83.68	85.14	57.08
2	Co 94008	2.54	2.77	1.350	13.73	12.01	86.34	8.26	68.20	70.63	55.88
3	Co 85004	2.27	2.90	1.184	14.70	12.95	86.99	8.94	93.33	94.79	56.46
	CD (0.05 %)	0.134	0.126	0.104	0.921	0.777	NS	0.527	9.230	8.688	NS
	CV	4.04	3.01	5.31	4.33	4.16	0.49	4.09	8.43	7.60	6.18

KERALA AGRICULTURAL UNIVERSITY
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All India Coordinated Research Project on Sugarcane

Annual Report 2012-2013

- 1. Title** : Advanced Varietal Trial (Early) - II Plant
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)
- 4. Technical Programme** :
- Entries (4) : Co 07012, Co 07015, CoN 07071 and PI 07131
 - Standards (3) : CoC 671, Co 94008 and Co 85004
 - Design : Randomised Block Design
 - Replications : Three
 - Plot size : Gross: 6m x 8r x 0.9m
: Net: 5m x 6r x 0.9m
 - Seed rate : 12 buds per metre
 - Crop duration : 10 months

5. Results:

CCS t/ha: Both the Standards CoC 671 and Co 85004 recorded highest CCS of 11.35 t/ha followed by clone PI 07131 (10.99 t/ha) and significantly superior to other entries and Co 94008

Yield t/ha: Standard Co 94008 recorded highest yield of 93.98 t/ha and followed by Co 85004 (89.45 t/ha) and significantly superior to all the entries and CoC 671

Brix % : Clone Co 07071 recorded highest Brix of 21.30 % followed by standard CoC 671 (21.07 %) and clone PI 07131 (20.53) and significantly superior to all other entries and other standards

Sucrose %: Clone Co 07071 recorded highest sucrose of 19.36 % followed by standard CoC 671 (19.14 %) and significantly superior to all other entries and other standards

CCS %: Clone Co 07071 recorded highest CCS of 13.55 % followed by standard CoC 671 (14.33 %) and Co 07015 (13.33 %) and significantly superior to all other entries and other standards

Sd/-
Signature of the Principal Investigator

3. Advanced Varietal Trial (Early II Plant)

Sl. No.	Clone	CCS t/ha	Cane Yield t/ha	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	Pol % cane (10 m)	Extraction % (10 m)	Fibre % (10 m)	NMC at 10 m ('000/ha)
1	Co 07012	8.90	70.27	20.00	18.10	89.68	12.65		62.35		93.98
2	Co 07015	9.05	67.87	20.50	18.70	90.43	13.33		61.36		72.69
3	CoN 07071	9.96	73.52	21.30	19.36	90.15	13.55		60.79		96.67
4	PI 07131	10.99	85.09	20.53	18.70	90.27	12.91		64.13		80.37
Stds											
1	CoC 671	11.35	84.54	21.07	19.14	90.07	13.43		60.69		105.47
2	Co 94008	10.41	93.98	17.87	16.14	89.44	11.08		60.50		102.96
3	Co 85004	11.35	89.45	20.10	18.25	90.00	12.69		61.48		103.89
	CD (0.05 %)	0.722	4.923	0.773	0.625	NS	0.336		NS		6.667
	CV	4.28	3.72	2.33	2.08	0.66	1.60		3.37		4.34

Sl. 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 shoots ('000/ha) 240 days	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 07012	2.27	2.73	1.283	16.13	14.22	87.15	9.82	105.46	109.44	52.00
2	Co 07015	2.55	2.83	1.367	16.20	14.21	86.76	9.79	71.67	74.17	46.00
3	CoN 07071	1.89	2.99	1.036	17.53	15.44	87.14	10.66	94.91	97.59	55.33
4	PI 07131	2.32	3.21	1.811	18.07	15.73	86.21	10.80	80.74	82.13	41.22
Stds											
1	CoC 671	2.41	2.95	1.422	14.57	12.83	87.01	8.86	93.43	96.39	44.78
2	Co 94008	2.28	3.00	1.289	13.90	12.20	86.65	8.41	102.59	103.98	58.72
3	Co 85004	2.22	2.89	1.217	17.03	14.90	86.53	10.25	101.94	104.91	62.22
	CD (0.05 %)	0.247	0.180	0.085	0.897	0.788	NS	0.548	11.097	11.388	5.181
	CV	6.62	3.72	3.83	3.37	3.38	0.48	3.41	7.27	7.27	6.13

KERALA AGRICULTURAL UNIVERSITY
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All India Coordinated Research Project on Sugarcane

Annual Report 2012-2013

- 1. Title** : Advanced Varietal Trial – Early (Ratoon)
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)
- 4. Technical Programme** :
- Entries (4) : Co 07012, Co 07015, CoN 07071 and PI 07131
 - Standards (3) : CoC 671, Co 94008 and Co 85004
 - Design : Randomised Block Design
 - Replications : Three
 - Plot size : Gross: 6m x 8r x 0.9m
: Net 5m x 6r x 0.9m
 - Crop duration : 9: months

5. Results:

CCS t/ha: Standard Co 94008 recorded highest CCS of 11.43 t/ha followed by standard CoC 671 and clone Co 07012 (both 10.77 t/ha) and significantly superior to all the entries and Co 85004

Yield t/ha: Standard Co 94008 recorded highest yield of 88.24 t/ha followed by clone Co 07012 (82.50 t/ha) and significantly superior to other the entries and other standards

Brix % : Standard CoC 671 recorded highest Brix of 21.13 % followed by clone Co 07015 (21.00 %), clone PI 07131 (20.67 %) and standard Co 94008 (20.33 %) and significantly superior to all the entries and other standards

Sucrose %: Standard CoC 671 recorded highest sucrose of 19.14 % followed by clone Co 07015 (18.98 %), clone PI 07131 (18.69%) and standard Co 94008 (18.47%) and significantly superior to other entries and standard Co 85004

CCS %: Standard CoC 671 recorded highest CCS of 13.39 % followed by clone Co 07015 (13.27 %), clone PI 07131 (13.06 %) and standard Co 94008 (12.94 %) and significantly superior to other entries and standard Co 85004

Sd/-

Signature of the Principal Investigator

4. Advanced Varietal Trial (Early Ratoon)

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (9 m)	Sucrose % (9 m)	Purity % (9 m)	CCS % (9 m)	Pol % cane (9 m)	Extraction % (9 m)	Fibre % (9 m)	NMC at 11 m ('000/ha)
1	Co 07012	10.27	82.50	19.67	17.80	89.70	12.45		57.78		92.41
2	Co 07015	8.21	61.94	21.00	18.98	89.63	13.27		61.92		75.46
3	CoN 07071	5.58	48.43	18.13	16.45	89.85	11.52		54.16		58.61
4	PI 07131	7.66	58.70	20.67	18.69	89.63	13.06		61.00		73.80
Stds											
1	CoC 671	10.77	80.56	21.13	19.14	89.78	13.39		63.09		80.74
2	Co 94008	11.43	88.24	20.33	18.47	90.03	12.94		57.08		95.18
3	Co 85004	9.17	77.78	18.73	16.90	89.36	11.80		60.35		74.35
	CD (0.05 %)	1.067	7.377	1.026	0.932	NS	0.668		5.390		8.156
	CV	7.21	6.32	3.13	3.16	0.65	3.22		5.54		6.32

Sl. No.	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	No. of tillers ('000/ha) 120 days	No. of tillers ('000/ha) 90 days
1	Co 07012	2.12	2.77	1.261	101.11	105.83
2	Co 07015	2.08	3.02	1.400	84.26	89.07
3	CoN 07071	1.48	2.88	1.017	65.56	69.17
4	PI 07131	2.21	2.97	1.578	92.59	95.83
Stds						
1	CoC 671	1.89	2.64	1.117	85.83	89.26
2	Co 94008	1.92	2.84	1.294	98.05	104.26
3	Co 85004	1.98	2.89	1.350	81.76	84.63
	CD (0.05 %)	0.172	0.207	0.146	7.852	7.062
	CV	5.37	4.40	6.89	5.50	4.72

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Annual Report 2012-2013

- 1. Title** : Initial Varietal Trial - Midlate
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)
- 4. Technical Programme** :
- Entries (10)** : Co 09009, Co 09010, Co 09012, Co 09013, Co 09014,
Co 02040, CoN 09073, CoN 09074, CoSnk 05102 and
CoVSI 09121
- Standards (2)** : Co 86032 and Co 99004
- Design** : Randomised Block Design
- Replications** : Three
- Plot size** : Gross: 6m x 6r x 0.9m
: Net: 5m x 4r x 0.9m
- Seed rate** : 12 buds per metre
- Crop duration** : 12 months

5. Results:

CCS t/ha: Standard Co 99004 recorded highest CCS of 14.07 t/ha and significantly superior to all the entries and standard Co 86032

Yield t/ha: Standard Co 99004 recorded highest yield of 107.28 t/ha and significantly superior to all the entries and standard Co 86032

Brix % : Standard Co 86032 recorded highest Brix of 21.87 % followed by clone Co 09009 (21.13%) and significantly superior to all other entries and standard Co 99004

Sucrose %: Clone Co 09009 recorded highest sucrose of 19.21 % and significantly superior to all other entries and both the standards

CCS %: Standard Co 86032 recorded highest CCS of 13.92 % followed by clone Co 09009 (13.46 %) and significantly superior to all other entries and standard Co 99004

Sd/-

Signature of the Principal Investigator

5. Initial Varietal Trial (Midlate)

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (12 m)	Sucrose % (12 m)	Purity % (12 m)	CCS % (12 m)	Pol % cane (12 m)	Extraction % (12 m)	Fibre % (12 m)	NMC at 12 m ('000/ha)
1	Co 09009	12.32	91.48	21.13	19.21	90.15	13.46		58.94		93.71
2	Co 09010	11.59	91.48	19.73	18.03	90.55	12.67		64.02		95.68
3	Co 09012	11.06	89.51	19.33	17.58	90.09	12.32		63.82		97.28
4	Co 09013	10.84	86.17	19.57	17.89	90.57	12.57		62.14		94.94
5	Co 09014	7.73	60.62	19.97	18.18	90.25	12.75		61.26		61.48
6	Co 02040	10.08	79.26	20.10	18.17	89.58	12.69		62.50		84.32
7	CoN 09073	10.56	83.58	19.80	18.03	90.25	12.65		62.96		84.94
8	CoN 09074	9.72	78.15	19.40	17.73	90.57	12.46		64.54		82.10
9	CoSnk 05102	6.49	58.15	17.53	15.92	89.90	11.15		64.70		62.34
10	CoVSI 09121	7.45	57.90	20.10	18.33	90.39	12.86		62.38		60.12
Stds											
1	Co 86032	12.47	89.63	21.87	19.87	90.11	13.92		62.45		91.73
2	Co 99004	14.07	107.28	20.53	18.70	90.29	13.11		62.67		109.88
	CD (0.05 %)	1.518	10.165	0.878	0.802	NS	0.614		NS		7.826
	CV	8.92	7.64	2.68	2.72	0.67	2.94		4.23		5.62

Initial Varietal Trial (Midlate) (Cont.....)

Sl. No.	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	No. of shoots ('000/ha) 240 days	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 09009	2.26	2.96	1.233	16.63	14.59	86.78	10.05	96.17	98.76	55.41
2	Co 09010	2.42	3.09	1.378	15.00	13.21	86.99	9.12	97.04	98.40	50.00
3	Co 09012	2.34	3.54	1.750	16.83	14.84	87.21	10.25	102.71	105.93	30.89
4	Co 09013	2.28	3.20	1.405	15.47	13.61	86.97	9.39	97.78	100.50	66.67
5	Co 09014	2.27	3.04	1.261	14.53	12.83	87.17	8.87	76.91	79.13	37.33
6	Co 02040	2.42	3.17	1.489	15.20	13.36	86.87	9.22	86.91	89.51	37.33
7	CoN 09073	2.28	3.04	1.372	16.73	14.67	86.73	10.10	85.19	86.05	40.81
8	CoN 09074	2.29	3.13	1.344	16.13	14.13	86.63	9.73	84.69	87.41	36.96
9	CoSnk 05102	2.48	3.24	1.639	14.17	12.43	86.65	8.57	67.65	72.47	53.04
10	CoVSI 09121	2.32	3.10	1.583	17.00	14.98	87.20	10.35	63.33	66.54	37.48
Stds											
1	Co 86032	2.41	3.33	1.539	16.53	14.60	87.33	10.09	97.16	102.71	52.89
2	Co 99004	2.41	3.17	1.378	15.07	13.30	87.21	9.19	112.22	114.57	61.71
	CD (0.05 %)	NS	0.215	0.158	0.968	0.866	NS	0.611	12.865	13.0589	6.058
	CV	6.05	4.14	6.63	3.74	3.80	0.60	3.89	8.81	8.67	7.90

KERALA AGRICULTURAL UNIVERSITY
Sugarcane Research Station
All India Coordinated Research Project on Sugarcane

Annual Report 2012-2013

- 1. Title** : Advanced Varietal Trial (Midlate) – I Plant
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)
- 4. Technical Programme** :
- Entries (5) : Co 08008, Co 08009, Co 08016, Co 08020 and CoSnk 08101
- Standards (2) : Co 86032 and Co 99004
- Design : Randomised Block Design
- Replications : Three
- Plot size : Gross: 6m x 8r x 0.9m
: Net: 5m x 6r x 0.9m
- Seed rate : 12 buds per metre
- Crop duration : 12 months

5. Results:

CCS t/ha: There was no significant difference between the entries for CCS t/ha. However, clone CoSnk 08101 showed numerical superiority among the treatments with a CCS of 13.20 t/ha

Yield: Clone CoSnk 08101 recorded highest yield of 107.97 t/ha followed by standard Co 99004 (103.89 t/ha) and significantly superior to all the entries and standard Co 86032

Brix % : Standard Co 86032 recorded highest Brix of 21.27 % followed by clone Co 08009 (21.23%), Co 08008 and Co 08016 (both 21.00 %) and significantly superior to other entries and standard Co 99004

Sucrose %: Standard Co 86032 recorded highest sucrose of 19.44 % followed by clone Co 08009 (19.29 %), Co 08008 (19.06 %) and Co 08016 (18.98 %) and significantly superior to other entries and standard Co 99004

CCS %: Standard Co 86032 recorded highest CCS of 13.66 % followed by clone Co 08009 (13.51 %), Co 08008 (13.35 %) and Co 08016 (13.27 %) and significantly superior to other entries and standard Co 99004

Sd/-

Signature of the Principal Investigator

6. Advanced Varietal Trial (Midlate I Plant)

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (12 m)	Sucrose % (12 m)	Purity % (12 m)	CCS % (12 m)	Pol % Cane (12 m)	Extraction % (12 m)	Fibre % (12 m)	NMC at 12 m ('000/ha)
1	Co 08008	10.95	82.04	21.00	19.06	90.00	13.35		62.32		106.58
2	Co 08009	12.28	90.93	21.23	19.29	90.07	13.51		60.77		96.85
3	Co 08016	12.05	90.83	21.00	18.98	89.64	13.27		61.77		83.70
4	Co 08020	11.61	91.20	20.00	18.18	90.09	12.74		61.97		98.70
5	CoSnk 08101	13.20	107.97	18.93	17.37	90.86	12.22		64.41		107.59
Stds											
1	Co 86032	11.10	81.39	21.27	19.44	90.65	13.66		58.65		92.50
2	Co 99004	11.49	103.89	17.57	15.84	89.27	11.06		63.58		103.80
	CD (0.05 %)	NS	12.319	0.718	0.663	NS	0.481		NS		9.450
	CV	8.00	8.11	2.17	2.21	0.62	2.28		4.420		5.84

Sl. No.	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	No. of shoots ('000/ha) 240 days	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 08008	2.46	2.83	1.256	15.97	14.06	87.10	9.71	114.07	118.15	57.78
2	Co 08009	2.57	3.01	1.428	15.47	13.69	87.48	9.47	105.37	109.45	36.67
3	Co 08016	2.14	2.92	1.189	16.30	14.38	87.24	9.93	94.72	98.52	31.61
4	Co 08020	2.29	3.02	1.339	14.33	12.59	86.73	8.68	109.26	111.67	51.61
5	CoSnk 08101	2.19	2.99	1.211	14.13	12.44	86.88	8.58	107.04	109.35	49.44
Stds											
1	Co 86032	2.32	3.29	1.545	15.60	13.76	87.17	9.50	98.80	102.78	48.00
2	Co 99004	2.19	3.04	1.361	12.37	12.59	86.57	8.67	109.91	114.35	62.22
	CD (0.05 %)	0.223	0.179	0.157	1.016	0.899	NS	0.628	8.917	8.679	5.020
	CV	5.89	3.62	7.16	4.16	4.10	0.74	4.15	5.15	4.84	6.35

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Annual Report 2012-2013

- 1. Title** : Advanced Varietal Trial (Midlate) - II Plant
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)
- 4. Technical Programme** :
- Entries (6)** : Co 07006, Co 07007, Co 07008, Co 07009, Co 07010 and
 CoSnk 07103
- Standards (2)** : Co 86032 and Co 99004
- Design** : Randomised Block Design
- Replications** : Three
- Plot size** : Gross: 6m x 8r x 0.9m
 : Net: 5m x 6r x 0.9m
- Seed rate** : 12 buds per metre
- Crop duration** : 12 months

5. Results:

CCS t/ha: Clone Co 07009 recorded highest CCS of 13.77 followed by standard Co 86032 (12.82 t/ha), clone Co 07008 (12.52 t/ha) and significantly superior to other entries and standard Co 99004

Yield: Clone Co 07009 recorded highest yield of 108.52 t/ha followed by standard Co 99004 (101.94 t/ha) and significantly superior to other entries and standard Co 86032

Brix % : Standard Co 86032 recorded highest Brix of 21.07 % followed by clone Co 07008 (20.47 %) and significantly superior to all other entries and standard Co 99004

Sucrose %: Standard Co 86032 recorded highest sucrose of 19.06 % followed by clone Co 07008 (18.62 %) and significantly superior to all other entries and standard Co 99004

CCS %: Standard Co 86032 recorded highest CCS of 13.32 % followed by clone Co 07008 (13.06 %) and significantly superior to other entries and standard Co 99004

Sd/-

Signature of the Principal Investigator

7. Advanced Varietal Trial (Midlate II Plant)

Sl. No.	Clone	CCS t/ha	Cane yield t/ha	Brix % (12 m)	Sucrose % (12 m)	Purity % (12 m)	CCS % (12 m)	Pol % Cane (12m)	Extraction % (12 m)	Fibre % (12 m)	NMC at 12 m ('000/ha)
1	Co 07006	11.32	95.83	18.50	16.83	90.12	11.80		60.54		103.61
2	Co 07007	11.75	95.56	19.17	17.51	90.51	12.30		62.57		102.31
3	Co 07008	12.52	95.93	20.47	18.62	90.21	13.06		59.47		102.41
4	Co 07009	13.77	108.52	19.73	18.03	90.55	12.67		62.46		115.19
5	Co 07010	10.86	94.07	18.10	16.45	89.99	11.53		59.50		100.00
6	CoSnk 07103	9.81	77.22	19.83	18.11	90.48	12.72		63.18		88.80
Stds											
1	Co 86032	12.82	96.30	21.07	19.06	89.69	13.32		62.38		99.26
2	Co 99004	12.05	101.94	18.50	16.83	90.11	11.80		62.32		106.94
	CD (0.05 %)	1.487	9.581	0.820	0.788	NS	0.573		NS		7.026
	CV	7.64	6.1023	2.57	2.71	0.56	2.82		3.53		4.18

Advanced Varietal Trial (Midlate II Plant) (Cont.....)

Sl. No.	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	Brix % (10 m)	Sucrose % (10 m)	Purity % (10 m)	CCS % (10 m)	No. of shoots ('000/ha) 240 days	No. of tillers ('000/ha) 120 days	Germination % (30 days)
1	Co 07006	1.97	2.70	1.161	14.33	12.59	86.76	8.68	103.61	106.39	52.33
2	Co 07007	2.17	2.88	1.344	15.07	13.29	87.19	9.19	101.20	104.63	40.72
3	Co 07008	2.25	2.73	1.078	15.83	13.82	86.33	9.50	102.41	105.46	35.66
4	Co 07009	2.07	2.77	1.067	15.87	13.98	87.15	9.66	114.26	117.41	49.89
5	Co 07010	2.25	2.48	1.206	14.93	13.22	87.46	9.15	99.07	103.15	43.11
6	CoSnk 07103	1.93	3.08	1.394	15.10	13.29	86.98	9.17	86.30	88.52	33.44
Stds											
1	Co 86032	2.26	2.92	1.500	15.73	13.92	87.45	9.63	99.63	103.33	47.22
2	Co 99004	2.20	3.00	1.639	14.87	13.14	87.28	9.08	108.33	110.65	62.78
	CD (0.05 %)	NS	0.238	0.156	0.899	0.771	NS	0.530	9.963	8.883	6.291
	CV	6.96	5.14	7.34	3.60	3.50	0.56	3.49	5.96	5.16	8.40

KERALA AGRICULTURAL UNIVERSITY
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Annual Report 2012-2013

- 1. Title** : Advanced Varietal Trial – Midlate (Ratoon)
- 2. Principal Investigator** : Dr. Shajan, V.R., Associate Professor (Plant Breeding)
- 3. Associates** : Smt. Bindhu.J.S., Assistant Professor (Agronomy)
: Dr. Sajeena.A., Assistant Professor (Plant Pathology)
- 4. Technical Programme** :
- Entries (6) : Co 07006, Co 07007, Co 07008, Co 07009, Co 07010 and CoSnk 07103
 - Standards (2) : Co 86032 and Co 99004
 - Design : Randomised Block Design
 - Replications : Three
 - Plot size : Gross: 6m x 8r x 0.9m
: Net: 5m x 6r x 0.9m
 - Crop duration : 11 months

5. Results:

CCS t/ha: Standard Co 86032 recorded highest CCS of 12.79 t/ha followed by clone Co 07010 (11.86 t/ha) and significantly superior to all other entries and standard Co 99004

Yield: There was no significant difference between the entries for yield. However, standard Co 86032 showed numerical superiority (94.35 t/ha) among the treatments

Brix %: Standard Co 86032 recorded highest Brix of 21.33 % and significantly superior to all the entries and standard Co 99004

Sucrose %: Standard Co 86032 recorded highest sucrose of 19.36 % and significantly superior to all the entries and standard Co 99004

CCS %: Standard Co 86032 recorded highest CCS of 13.56 % and significantly superior to all the entries and standard Co 99004

Sd/-

Signature of the Principal Investigator

8. Advanced Varietal Trial (Midlate - Ratoon)

Sl. No.	Clone	CCS t/ha	Cane Yield t/ha	Brix % (11 m)	Sucrose % (11 m)	Purity % (11 m)	CCS % (11 m)	Pol % Cane (11m)	Extraction % (11 m)	Fibre % (11 m)	NMC at 11 months ('000/ha)
1	Co 07006	10.92	87.78	19.50	17.73	90.11	12.43		56.02		93.52
2	Co 07007	10.69	82.68	20.17	18.41	90.47	12.92		65.95		88.15
3	Co 07008	10.86	85.09	20.17	18.24	89.66	12.76		62.69		91.30
4	Co 07009	9.81	75.74	20.50	18.54	89.65	12.96		59.89		82.78
5	Co 07010	11.86	92.50	20.00	18.26	90.47	12.82		54.92		97.13
6	CoSnk 07103	11.29	86.29	20.63	18.69	89.80	13.08		57.64		92.87
Stds											
1	Co 86032	12.79	94.35	21.33	19.36	90.00	13.56		57.13		101.20
2	Co 7219	10.83	87.78	19.33	17.58	90.12	12.32		61.02		94.63
	CD (0.05 %)	1.435	NS	0.593	0.479	NS	0.327		NS		7.641
	CV	7.85	7.18	1.790	1.59	0.52	1.55		7.12		5.02

Sl. No.	Clone	Stalk Length (m)	Stalk Diameter (cm)	Single cane weight (kg)	No. of shoots ('000/ha) 180 days	No. of tillers ('000/ha) 90 days
1	Co 07006	1.72	2.77	1.138	95.19	97.32
2	Co 07007	1.92	2.85	1.133	92.41	93.98
3	Co 07008	1.98	2.74	1.367	93.70	94.91
4	Co 07009	1.84	2.93	1.133	84.08	86.20
5	Co 07010	2.12	2.37	0.995	101.58	103.89
6	CoSnk 07103	1.93	2.80	1.233	91.48	95.18
Stds						
1	Co 86032	2.06	3.02	1.461	103.24	105.93
2	Co 7219	2.14	2.79	1.539	97.59	100.55
	CD (0.05 %)	0.158	0.229	0.162	8.914	8.747
	CV	4.90	5.01	7.89	5.72	5.48

Fluff 2012

Date of receipt: 07/02/2013

Date of sowing: 18/03/2013

No. of Zonal Crosses:13

No. of Station Crosses:19

No. of PCs:11

No. of GCs:20

Sl. No	Cross	Fluff wt	No of seedling	seedlings/ gm
1	Co 98008XCo 62198	16.5	46	2.79
2	Co 98010 XCoN 98133	9.5	36	3.79
3	Co 0238 XCoS 93278	15.0	0	0
4	ISH 100XBo 32	16.0	14	0.88
5	Co 8371X CoC 8001	36.0	987	27.42
6	Co 0238 XCoN 98133	11.5	7	0.61
7	Co 92006 XCoC 8001	26.0	246	9.46
8	Co 9091 X Bo 91	17.0	4	0.24
9	Co86010 X Co 1148	8.0	5	0.63
10	Co 2000-10 X CoT 8201	10.0	78	7.8
11	Co 98010 Xco 86249	5.0	0	0
12	CoC 671 X ISH 229	13.0	0	0
13	Co 88028 X CoA 7602	6.0	0	0
14	Co 93020 XCoT 8201	18.5	100	5.41
15	CoTI 85119 XCoA7602	17.5	0	0
16	Co 94007 X CoT8201	26.5	71	2.68
17	MS 6847 XCoA 7602	18.5	421	22.76
18	Co 86032 X Co 62198	15.5	0	0
19	Co 86032 X CoA 7602	34.0	172	5.06
	Total	303.5	2187	7.21
	Zonal cross			
1	Co 86002 X Co1148	10.5	3	0.29
2	Co 8213 X Co 86011	13.0	0	0
3	Co 8213 X CoT 8201	20.5	785	38.29
4	Co 85002 X Co 62174	11.0	4	0.36
5	Co 8371 X Co 86011	8.0	18	2.25
6	Co 8371X CoT 8201	20.5	2	0.1
7	Co 7201 XCoC 671	2.5	0	0
8	CoC 671 X Co 94008	19.0	0	0
9	CoV 94101 X Co 97015	9.5	0	0
10	CoC 671 X CoT 8201	9.5	45	4.74
11	Co 740 X Co 775	2.5	2	0.8
12	CoM 0265 X Co 99006	3.5	0	0
13	CoM 0265 X Co 775	8.5	35	4.12
	Total	115.0	894	

	Poly cross			
1	CoM 0265	6.5	0	0
2	ISH 100	7.0	47	6.71
3	Co 94012	3.5	0	0
4	Co 85002	12.5	120	9.6
5	CoA 7602	11.0	130	11.82
6	CoC 671	9.5	0	0
7	81V 48	11.0	40	3.64
8	CP 52-68	1.0	0	0
9	Co 2000-10	27.5	20	0.73
10	Co 7201	5.0	278	55.6
11	Co 8371	13.5	1	0.07
	Total	95.5	636	
	General Collection			
1	C 79218	40.50	100	2.47
2	Co 1148	2.50	0	0
3	Co 8213	18.00	534	29.67
4	Co 8371	17.50	4	0.23
5	Co 200-10	32.00	300	9.38
6	Co 86002	2.50	16	6.4
7	Co 8347	3.50	3	0.86
8	Co 7717	13.00	0	0
9	CoC 671	20.50	16	0.78
10	CoT 8201	6.00	2	0.33
11	CoTl 85119	19.50	2	0.1
12	CoV 92102	48.00	27	0.56
13	ISH 100	16.00	80	5
14	ISH 139	30.50	59	1.93
15	ISH 23	12.50	118	9.44
16	Co 98008	15.00	470	31.33
17	Co8208	19.00	307	16.16
18	Co 85002	21.00	307	14.62
19	Co 98006	13.00	150	11.54
20	Co 98016	26.50	50	1.89
	Total	377.00	2545	
	Grand Total	891.00	6262	

Details of seedlings obtained from fluff exchange programme from 2008-2012							
Sl.No.	Year sown	Crosses	PC / GC	No. of seedlings obtained initially	Seedlings transplanted	C1	CII
1	2012						
2	2011	32	34	12352	8545		
3	2010	29	26	6498	4253	110	
4	2009	26	43	6529	4328	60	10
5	2008	31	30	24685	4836	158	48

Meteorological data during the crop period (January 2012-December 2012)

Month/year	Temperature (°C)		Rain fall (mm)	Rainy days
	Maximum	Minimum		
January -2012	23.90	31.49	4	2
February – 2012	22.85	33.10	Nil	0
March - 2012	26.80	32.54	27	6
April - 2012	27.41	32.81	127	13
May- 2012	28.08	31.53	150	9
June - 2012	26.23	29.80	160.5	15
July - 2012	26.21	29.66	272.5	14
August - 2012	24.70	28.60	382	20
September - 2012	25.50	27.79	126	8
October - 2012	24.40	31.50	3	1
November - 2012	21.8	31.2	29	2
December - 2012	20.41	30.90	NA	NA

Crop Production

KERALA AGRICULTURAL UNIVERSITY
SUGARCANE RESEARCH STATION, THIRUVALLA

**AICRP on Sugarcane –Crop Production
Annual Report for 2012-13**

- 1. Name of the project** : **Agronomic evaluation of promising sugarcane genotypes**
- 2. Project No** : AS 42
- 3. Year of start** : 2012-2013 (with new set of genotypes of AVT)
- 4. Objectives** : To identify the most suitable genotype and to work out the economic fertilizer dose for the given genotypes of AVT.
- 5. Technical Programme**

Treatments

A. Varieties

V₁ – CoM 06084, V₂ - Co 6027, V₃ - Co 6012

B. Fertilizer levels

F₁- 75 percent of the recommended dose of N

F₂- 100 percent of the recommended dose of N

F₃- 125 percent of the recommended dose of N

Design - Factorial RBD

Replications -Three

Plot size - 6 x 5.4 m²

6. Results of the experiment for the current year :

The experiment was conducted with three promising cultures namely, V₁ - CoM 06084, V₂ - Co 6027 and V₃ - Co 6012 with three nitrogen levels – ie., 75(F₁), 100(F₂) and 125 % (F₃) of the recommended dose of N (100% of the recommended dose of N = 165 kg/ha). The crop was planted on 25.02.2012 and harvested on 28.01.2013.

The yield attributes juice quality parameters, cane yield and sugar yield were significantly influenced by the genotypes and mineral nutrition with different doses of nitrogen. Among the varieties studied, the variety Co 6012 (V₃) recorded maximum values for cane length, cane girth, single cane weight and millable cane count resulted in highest cane yield (93.41 t/ha) and sugar yield (13.87 t/ha) and was on par with the variety Co 6027 (V₂).

The yield attributing factors, cane yield and juice parameters were significantly influenced by different levels of nitrogen. Application of N at 100% of R.D. had recorded maximum cane and sugar yield (F₂) and it was significantly superior to mineral nutrition with N at 75% and on par with 125% of R.D.

The interaction effect between variety and N levels were found significant only for CCS% and sugar yield at harvest. The variety Co 6012(V₃) with recommended dose of N had recorded the highest value for sugar yield (15.20 t/ha).

7. Summary

It can be concluded from the study that the genotype Co 6012 is found to be promising as it has recorded the highest cane and sugar yield followed by the genotype Co 6027. All the genotypes performed better at 100 % of the recommended dose of N.

Cane yield and juice quality as influenced by varieties and fertilizer levels

Treatments	Cane length (cm)	Cane girth (cm)	Single cane wt (kg)	MCC (t/ha)	SMT Brix (%)	CCS (%)	Cane yield (t/ha)	Sugar yield (t/ha)
V ₁	220.92	9.11	1.22	63.82	17.26	13.63	68.03	9.27
V ₂	226.72	9.21	1.43	90.15	19.37	15.07	90.16	13.58
V ₃	49.18	9.48	1.70	94.91	19.44	14.85	93.41	13.87
CD (0.05)	12.55*	NS	0.1*	4.90*	1.53*	0.88*	4.8*	1.03*
F ₁	220.74	9.07	1.36	80.04	18.70	14.52	76.58	11.12
F ₂	237.35	9.28	1.48	84.01	17.85	15.05	87.71	13.20
F ₃	238.74	9.44	1.51	84.85	19.51	13.99	87.31	12.21
CD (0.05)	12.55*	NS	0.1*	NS	NS	NS	4.8*	1.03*
V ₁ F ₁	206.11	8.89	1.17	63.07	16.86	13.91	61.18	8.51
V ₁ F ₂	232.78	9.19	1.25	65.22	16.67	14.30	70.23	10.04
V ₁ F ₃	223.89	9.27	1.22	63.17	18.24	12.70	72.67	9.23
V ₂ F ₁	213.33	8.99	1.27	83.95	19.64	13.62	84.31	11.48
V ₂ F ₂	228.18	9.14	1.47	95.80	18.74	15.72	92.34	14.52
V ₂ F ₃	238.65	9.49	1.57	90.72	19.73	15.87	93.84	14.89
V ₃ F ₁	242.78	9.34	1.64	93.09	19.61	16.02	84.26	13.50
V ₃ F ₂	251.11	9.51	1.72	91.00	18.14	15.12	100.55	15.20
V ₃ F ₃	253.67	9.58	1.73	100.65	20.57	13.40	95.43	12.79
VxF CD (0.05)	NS	NS	NS	NS	NS	1.53*	NS	1.78*

Sd/-

Signature of the Principal Investigator

Sd/-

Signature of the Head of Station

KERALA AGRICULTURAL UNIVERSITY
SUGARCANE RESEARCH STATION, THIRUVALLA

**AICRP on Sugarcane –Crop Production
Annual Report for 2012-13**

1. Name of the project : **Plant geometry in relation to mechanization in sugarcane**
2. Project No : AS 63
3. Duration of study : 2011-2014
4. Objectives :
 1. To find out plant geometry for use of farm machinery
 2. To study varietal response to different plant geometry

5. Technical Programme

Treatments

A: Plant Geometry

1. 120cm row distance (G_1)
2. 150cm row distance (G_2)
3. 30 x 150cm (G_3)

B: Genotypes

1. V_1 – CoVSI 5122
2. V_2 – CoSnk 05105
3. V_3 – Co 05007
4. V_4 - Madhuri

Plot size: 6 x 8 m

Design: Split plot

Replications: 4

6. Results of the experiment for the current year :

The experiment was conducted with four genotypes (Co VSI 5122, Co Snk 05105, Co 05007, Madhuri) with different row spacing of G_1 (120cm row distance), G_2 (150 cm row distance) and G_3 (30 x 150 cm). The crop was planted on 17-2-2012 and harvested on 7-2-2013.

The results revealed that the MCC, single cane weight, cane yield and sugar yield were significantly influenced by the row spacing. Row spacing of 30x150 cm (G_3) recorded highest MCC (79330/ha), cane (88.97t/ha) and sugar yield (12.01 t/ha). The treatments with row spacing of 120 cm had recorded highest single cane weight and it was on par with row spacing of 30x150 cm (G_3).

Among the genotypes evaluated, Madhuri had recorded significantly higher cane girth, MCC, single cane weight followed by the variety Co 05007 (V_3). The variety madhuri recorded the highest cane yield (88.04t/ha) and sugar yield (12.03t/ha). However in cane yield, it was statistically on par with the variety V_3 (Co 05007).

The results of the quality analysis revealed that the variety CoVSI 5122 recorded highest brix value (18.93 %) and significantly superior to other 3 varieties. The CCS% was not influenced by the treatments.

The interaction effect between varieties and row spacings were found to be non significant.

7. Summary

It can be concluded from the study that the row distance of 30 x 150 cm was found to be suitable for getting maximum cane and sugar yield. The variety Madhuri responded well to different row spacing and it has recorded the highest cane and sugar yield followed by the variety Co 05007.

Cane yield and juice quality as influenced by plant geometry and genotypes

Treat ment	Cane length (cm)	Cane girth (cm)	MCC (‘000/ha)	Single cane wt. (kg)	SMT Brix(%)	CCS (%)	Cane yield (t/ha)	Sugar yield (t/ha)
G ₁	207.69	9.57	67.02	1.37	17.03	12.39	77.44	9.6
G ₂	210.94	9.38	64.24	1.19	16.80	13.74	72.39	9.97
G ₃	218.44	9.35	79.33	1.27	17.82	13.52	88.97	12.01
CD (0.05)	NS	NS	3.47*	0.1*	NS	NS	2.66*	0.99*
V ₁	207.75	8.90	62.57	1.06	18.93	12.90	70.96	9.18
V ₂	221.92	9.31	66.57	1.18	16.16	13.30	75.54	10.08
V ₃	206.25	9.61	74.67	1.33	16.49	12.92	83.87	10.79
V ₄	13.50	9.92	76.97	1.53	17.29	13.73	88.04	12.03
CD (0.05)	9.32*	0.49*	4.27*	0.21*	1.06*	NS	4.99*	0.94*
G ₁ V ₁	201.50	9.16	60.08	1.08	19.66	12.24	69.41	8.48
G ₁ V ₂	215.25	9.21	64.80	1.13	14.76	12.32	68.98	8.50
G ₁ V ₃	193.25	9.81	72.66	1.42	17.14	11.74	85.10	10.03
G ₁ V ₄	220.75	10.13	70.55	1.86	16.59	13.25	86.28	11.37
G ₂ V ₁	214.50	8.59	58.20	1.08	18.44	12.73	61.78	7.85
G ₂ V ₂	222.50	9.44	62.29	1.18	16.19	13.81	71.61	9.90
G ₂ V ₃	205.50	9.38	68.22	1.15	15.31	13.95	75.68	10.46
G ₂ V ₄	201.25	10.13	68.25	1.37	17.29	14.49	80.50	11.65
G ₃ V ₁	207.25	8.96	69.44	1.01	18.71	13.74	81.70	11.22
G ₃ V ₂	228.00	9.28	72.64	1.24	17.54	13.78	86.03	11.84
G ₃ V ₃	220.00	9.65	83.13	1.44	17.01	13.10	90.84	11.89
G ₃ V ₄	218.50	9.50	92.11	1.37	18.01	13.47	97.34	13.07
GxV CD(0.05)	NS	NS	NS	NS	NS	NS	NS	NS

Sd/-

Signature of Principal Investigator

Sd/-

Signature of Head of Station

KERALA AGRICULTURAL UNIVERSITY
SUGARCANE RESEARCH STATION, THIRUVALLA

**AICRP on Sugarcane –Crop Production
Annual Report for 2012-13**

1. Name of the project - **Response of sugarcane crop to different plant nutrients in varied agro-ecological situations.**
2. Project No : AS 64
3. Year of start : 2011-12
4. Objective : To study differential Response of sugarcane crop to different plant nutrients
5. Technical Programme
Treatments
T₁ – control (No fertilizers)
T₂ – N
T₃ – NP
T₄ – NPK
T₅ – NPK+S
T₆ – NPK+Zn
T₇ – NPK+Fe
T₈ – NPK+Mn
T₉ – NPK+S+Zn
T₁₀ – NPK+S+Zn+Fe
T₁₁ – NPK+S+Zn+Fe+Mn
T₁₂ – Soil test based fertilizer application
T₁₃ - FYM @20 t/ha

Design - RBD,
Variety - Madhuri
Replications - Three

6. Results of the experiment for the current year:

The experiment was conducted to study the response of sugarcane crop to different plant nutrients. The crop was planted on 23-2-2012 and harvested on 27-2-2013.

The treatment variation due to different combination of plant nutrients were significant for yield parameters, cane and sugar yield. The maximum cane length was obtained from the application of NPK+Zn which was significantly superior to treatments receiving N, NP, NPK+Mn, FYM and control and was on par with all other treatments. Single cane weight, MCC, CCS were found to be statistically significant. The treatment NPK+Zn recorded the highest single cane weight of 1.53 kg. Application of soil test based recommendation recorded highest MCC of 91000/ha and maximum value for CCS (16.40%) was obtained from NPK+S+Zn.

The initial soil fertility status had shown that the soil is medium in available N, high in available P and K and the levels of S, Mn, Fe, and Zn were adequate. Soil sample analysis after the experiment revealed that the soil status of available N, P, Fe, S, and Zn were statistically influenced by the treatments.

The soil test based recommendations (T₁₂) recorded the highest cane yield and was on par with the recommended dose of NPK+Zn (T₆) while the highest sugar yield (15.2 t/ha) was recorded in treatment T₆ Which was on par with the treatment T₁₂. The control plot recorded the lowest sugar and cane yield.

7. Summary

It can be concluded that for obtaining higher cane and sugar yield ,fertilizer application as per soil test based recommendations and recommended dose of NPK+Zn (50 kg ZnSO₄/ha) were found to be the best .

Cane yield and juice quality as influenced by different plant nutrients

Treatments		Cane length (cm)	Cane girth (cm)	Cane weight (kg)	MCC ('000/ha)	CCS (%)	Cane yield (t/ha)	Sugar yield (t/ha)
T ₁	Control	186.33	9.44	1.13	53.88	15.65	55.53	8.65
T ₂	N	205.00	9.87	1.21	63.96	13.78	64.81	8.93
T ₃	NP	195.33	9.54	1.23	61.60	14.22	70.37	10.06
T ₄	NPK	207.77	10.71	1.39	75.42	14.26	69.27	9.90
T ₅	NPK+S	223	10.04	1.32	79.17	15.54	83.59	13.02
T ₆	NPK+Zn	225.77	10.74	1.53	85.92	15.4	98.63	15.20
T ₇	NPK+ Fe	211.67	10.40	1.22	70.47	14.71	78.04	11.42
T ₈	NPK+ Mn	198.2	10.59	1.29	73.52	15.68	73.48	11.54
T ₉	NPK+S+Zn	216.00	10.48	1.50	88.35	16.40	77.93	12.72
T ₁₀	NPK+S+Zn+Fe	207.33	10.05	1.21	85.00	13.53	89.17	12.07
T ₁₁	NPK+S+Zn+Fe+Mn	206.67	10.33	1.30	85.64	13.66	95.60	13.03
T ₁₂	Soil test based application	219.53	10.18	1.45	91.00	13.39	101.38	13.54
T ₁₃	FYM @20 t/ha	192.21	10.13	1.19	61.56	14.77	62.49	9.23
CD (0.05)		19.28*	NS	0.16*	10.97*	1.71*	14.96*	2.31*

INITIAL FERTILITY STATUS OF THE EXPERIMENTAL SITE

Available N (Kg/ha soil)	Available P (Kg/ha soil)	Available K (Kg/ha soil)	S (ppm)	Fe (ppm)	Zn (ppm)	Mn (ppm)
295	23.12	267.5	5.83	65.37	4.23	8.82

FINAL FERTILITY STATUS OF THE EXPERIMENTAL SITE							
Treat-ments	Available N (Kg/ha soil)	Available P (Kg/ha soil)	Available K (Kg/ha soil)	S (ppm)	Fe (ppm)	Zn (ppm)	Mn (ppm)
T ₁	186.37	16.55	197.74	6.33	218.13	1.65	28.28
T ₂	254.10	19.45	232.20	4.83	220.33	2.08	41.08
T ₃	225.72	21.4	256.25	6.5	103.20	2.24	54.15
T ₄	211.55	19.42	267.03	6.58	186.53	2.27	57.95
T ₅	240.03	21.50	221.33	5.33	104.20	2.6	43.90
T ₆	232.87	22.82	252.94	7.08	254.47	2.45	47.67
T ₇	191.40	16.01	223.17	4.33	282.33	2.22	47.40
T ₈	239.29	15.95	214.31	4.33	197.93	2.20	48.54
T ₉	219.15	21.49	245.19	8.00	92.95	2.10	41.33
T ₁₀	177.86	17.17	238.15	3.75	238.13	3.12	53.86
T ₁₁	275.89	19.54	241.32	8.08	350.47	2.01	61.95
T ₁₂	208.77	18.38	245.74	4.00	173.07	2.48	41.19
T ₁₃	200.32	25.42	196.33	6.00	161.80	2.13	47.77
CD (0.05)	47.94*	4.54*	NS	2.39*	140.09*	0.53*	NS

Sd/-
Signature of Principal Investigator

Sd/-
Signature of the Head of Station

KERALA AGRICULTURAL UNIVERSITY
SUGARCANE RESEARCH STATION, THIRUVALLA

**AICRP on Sugarcane –Crop Production
Annual Report for 2012-13**

1. Name of the project : **Priming of cane node for accelerating germination**
2. Project No. : AS 66
3. Year of start : 2012-2013
4. Objective :
 1. To find out suitable cane node priming technique.
 2. To assess the effect of cane node on acceleration of germination.

5. Technical Programme

Treatments – 6

T₁: Un-primed cane node

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

T₃: Treating cane node in hot water (50° C) urea solution (3%) for 2 hours

T₄: Priming cane node 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.)

Design - RBD,

Variety - Madhuri

Replications - Four

6. Results of the experiment for the current year :

The experiment was conducted to find out suitable cane node priming technique and to assess the effect of cane node on acceleration of germination. The crop was planted on 15-1-2012 and harvested on 25-2-2013.

The experimental results revealed that the different priming techniques significantly influenced the germination percentage and shoot population.

Highest germination percentage and maximum shoot population were recorded in 3-bud sett planting (T₅) which was on par with the treatment of priming cane node in cattle dung, cows urine and water (T₄). The lowest value for the above parameters were obtained for primed and sprouted cane node (T₆).

Highest cane length (259 cm), MCC (98400/ha), cane yield (114.58 t/ha) and sugar yield (16.83 t/ha) were recorded for the 3 bud sett planting (T₅) which was on par with the treatment T₄. But cane girth, single cane weight, CCS% were not significantly influenced by the treatments.

7. Summary

The experimental results revealed that the conventional 3-bud sett planting recorded the highest germination percentage, cane and sugar yield and it was on par with Priming cane node with cattle dung, cattle urine and water in 1:2:5 ratio.

Effect of cane node on acceleration of germination and shoot population

Treatments		Germination % At 20 DAS	Germination % At 30 DAS	Germination % At 40 DAS	Shoot population At 90 DAS (000/ha)	Shoot population At 120 DAS (000/ha)	Shoot population At 150 DAS (000/ha)
T ₁	Un primed cane node	20.30	37.45	39.7	97.78	125.75	92.32
T ₂	Cane node in hot water at 50° c for 2 hours	20.58	37.42	40.48	112.41	128.18	102.30
T ₃	Cane node in hot water (50° c) Urea solution (3%))for 2 hours	24.93	42.27	44.51	112.75	136.15	101.76
T ₄	Cane node in cattle dung, cows urine and water (1:2:5)	26.67	51.60	53.68	116.50	144.98	107.96
T ₅	3 bud sett	28.07	51.28	53.76	128.41	154.14	107.41
T ₆	Primed and sprouted cane node	17.55	31.77	34.78	98.75	126.00	79.54
CD (0.05)		2.6*	2.98*	3.35*	7.17*	11.11*	12.04*

Cane yield and juice quality as influenced by cane node priming techniques

Treatments		Cane length (cm)	Cane girth (cm)	Cane weight (kg)	MCC ('000/ha)	CCS (%)	Cane yield (t/ha)	Sugar yield (t/ha)
T ₁	Un primed cane node	231.25	9.67	1.54	75.84	13.74	81.75	11.23
T ₂	Cane node in hot water at 50° c for 2 hours	244.75	9.29	1.68	92.4	13.76	92.25	12.69
T ₃	Cane node in hot water (50° c) Urea solution (3%))for 2 hours	240.75	9.55	1.50	92.13	14.03	98.51	13.82
T ₄	Cane node in cattle dung, cows urine and water (1:2:5)	256.75	10.29	1.77	97.67	13.96	112.33	15.68
T ₅	3 bud sett	259	10.23	1.73	98.40	14.69	114.58	16.83
T ₆	Primed and sprouted cane node	225.5	9.82	1.58	72.96	14.58	77.71	11.33
CD (0.05)		20.22*	NS	NS	9.56*	NS	9.0*	1.73*

Sd/-

Signature of Principal Investigator

Sd/-

Signature of the Head of Station

Pathology

**KERALA AGRICULTURAL UNIVERSITY
SUGARCANE RESEARCH STATION
THIRUVALLA**

ANNUAL REPORT FOR 2012-13

1. Title : **Evaluation of zonal varieties for resistance to red rot**
2. Objectives : To gather information on the relative resistance to red rot of the entries in zonal varietal trials of the respective zones
3. Technical programme including observations required
 - a. Varieties/genotypes : All the centers will test all the entries of early and mid late genotypes under IVT and AVT (2008-09) of the respective zone.
 - b. Inoculum : Isolates chosen will be only from local red rot collection.
 - c. Method of inoculation : Plug and cotton swab methods of inoculation to be done in the fortnight of August to first week of September when 6 to 7 well formed internodes are formed.
 - d. Observation : One observation at the 60th day of inoculation. The canes are split opened longitudinally along the point of inoculation. This is graded on the international scale of 0-9.

4. Evaluation (result)

(a) **INITIAL VARIETAL TRIALS**

All the entries in the IVT (Early & Midlate) were inoculated by plug and cotton swab methods of inoculation with the isolates of red rot pathogen and observations were recorded 60 days after inoculation (Table 1).

(i) **Initial Varietal Trial (Early)**

Out of the 8 entries tested in the IVT (Early), five varieties viz., Co 09004, Co 09005, Co 09006, Co 09007 and Co N 09071 showed moderate resistance (MR) reaction and three varieties viz., Co 09002, Co 09003 and Co N 09072 showed moderate susceptibility (MS) reaction to plug method of inoculation.

All the varieties showed resistant reaction to cotton swab method of inoculation.

(ii) **Initial Varietal Trial (Midlate)**

Out of the 10 entries tested in the IVT (Midlate), six varieties viz., Co 09009, Co 09012, Co 09014, Co N 09073, Co N 09074 and Co Snk 05102 showed moderately resistance reaction, one variety viz., Co 09013 showed moderately susceptible reaction (MS) and three varieties viz., Co 09010, Co 02040 and Co VSI 09121 showed susceptibility reaction to plug method of inoculation.

Among the ten varieties tested by cotton swab method of inoculation, eight varieties showed resistance reaction where as two varieties viz., Co 09010 and Co VSI 09121 showed susceptible reaction.

(b) **Advanced Varietal Trials**

All the entries in the AVT (Early & Midlate) were inoculated by plug and cotton swab methods of inoculation with the isolates of red rot pathogen and observation were recorded 60 days after inoculation (Table 2).

(i) Advanced Varietal Trial (Early) I Plant

Out of the 2 entries tested in the AVT (Early I plant), one variety viz., Co 08001 showed moderate susceptibility reaction and the other variety viz., VSI 08121 showed highly susceptible reaction to plug method of inoculation.

In cotton swab method of inoculation, Co 08001 showed resistance reaction and VSI 08121 showed susceptible reaction.

(ii) Advanced Varietal Trial (Midlate) I Plant

Out of the 5 entries tested in the AVT (Midlate I Plant), three varieties, viz., Co 08008, Co 08009 and Co Snk 08101 showed moderate resistance reaction, where as the other two varieties viz., Co 08016 and Co 08020 showed susceptible reaction to plug method of inoculation.

All the varieties showed resistant reaction to cotton swab method of inoculation.

(iii) Advance Varietal Trial (Early) II Plant

Out of the seven entries tested in the AVT (Early II Plant), four varieties viz ., Co 07012, Co N 07071, PI 07131 and Co 94008 showed moderately resistant reaction, two varieties viz., Co 07015 and Co 85004 showed moderately susceptible reaction and one variety viz., CoC 671 showed highly susceptible reaction to plug method of inoculation.

All the varieties except one variety viz., CoC 671 showed resistance reaction to cotton swab method of inoculation.

(ii) Advance Varietal Trial (Midlate) II Plant

Out of the eight entries tested in the AVT (Midlate II Plant), only one variety viz., Co 07009 showed moderately resistant reaction, where as four varieties viz., Co 07006, Co 07007, Co Snk 07103 and Co 99004 showed moderately susceptible reaction and three varieties viz., Co 07008, Co 07010 and Co 86032 showed susceptible reaction to plug method of inoculation.

All the varieties showed resistant reaction to cotton swab method of inoculation.

Sd/-

Signature of Scientist

Sd/-

Signature of Head of office

Evaluation of Zonal varieties/genotypes for resistance to red rots (2012-13)

Location: Sugarcane Research Station, Thiruvalla

Table 1. Initial varietals trials (Early and Mid late)

SL.No	Genotypes	Plug Method		Cotton swab Method	
		Reaction	Score	Reaction	Score
A. IVT (Early)					
1.	Co 09002	MS	4.8	R	2.0
2.	Co 09003	MS	4.4	R	3.2
3.	Co 09004	MR	3.6	R	1.4
4.	Co 09005	MR	3.4	R	3.2
5.	Co 09006	MR	4.0	R	2.0
6.	Co 09007	MR	3.4	R	4.0
7.	CoN 09071	MR	3.4	R	1.0
8.	CoN 09072	MS	5.8	R	3.2
B. IVT (MID LATE)					
1.	Co 09009	MR	4.0	R	0
2.	Co 09010	S	7.2	S	6.4
3.	Co 09012	MR	3.6	R	1.4
4.	Co 09013	MS	4.6	R	2.0
5.	Co 09014	MR	4.0	R	4.8
6.	Co 02040	S	7.0	R	3.8
7.	Co N 09073	MR	3.8	R	1.4
8.	Co N 09074	MR	3.5	R	3.2
9.	Co Snk 05102	MR	3.2	R	2.0
10.	Co VSI 09121	S	8.0	S	6.2

Table 2. Advanced varietals trials

SL.No	Genotypes	Plug Method		Nodal Method	
		Reaction	Score	Reaction	Score
A. AVT (Early) I Plant crop					
1.	Co 08001	MS	4.4	R	1.4
2.	Co VSI 08121	HS	9.0	S	6.6
B. AVT (Midlate) I Plant crop					
1.	Co 08008	MR	3.2	R	1.4
2.	Co 08009	MR	3.4	R	4.8
3.	Co 08016	S	6.3	R	2.0
4.	Co 08020	S	5.8	R	3.8
5.	Co Snk 08101	MR	3.2	R	3.2
C. AVT (Early) II Plant					
1.	Co 07012	MR	4.0	R	1.0
2.	Co 07015	MS	4.2	R	2.0
3.	Co N 07071	MR	3.0	R	3.2
4.	PI 07131	MR	2.8	R	4.8
5.	Co 85004	MS	6.0	R	2.0
6.	Co 94008	MR	3.2	R	3.8

7.	CoC 671	HS	9.0	S	6.6
D. AVT (Midlate) II Plant					
1.	Co 07006	MS	4.5	R	1.0
2.	Co 07007	MS	5.2	R	3.2
3.	Co 07008	S	7.4	R	4.0
4.	Co 07009	MR	3.2	R	4.8
5.	Co 07010	S	7.2	S	6.3
6	Co Snk 07013	MS	5.6	R	3.2
7.	Co 86032	S	6.4	R	1.4
8.	Co 99004	MS	5.0	R	3.8

**KERALA AGRICULTURAL UNIVERSITY
SUGARCANE RESEARCH STATION
THIRUVALLA**

ANNUAL REPORT FOR 2012-2013

Project No	: PP.14
Title	: Identification of pathotypes of red rot pathogen
Objective	: To gather information on the major pathotypes of red rot pathogen from the different areas /zones.
Location	: Peninsular zone-Thiruvalla, Sugarcane Research Station, Thiruvalla.
Year of start	: 1983-84 (continuing project)
Differential varieties/genotypes	: Baragua Khakai SES 594 CoS 767 BO 91 CoC 671 Co 7717 Co 997 Co J 64 Co 1148 Co 419 Co 62399 Co 975 CoS 8436
No. of isolates	: Virulent isolates collected from redroot affected canes of commercially cultivated varieties in the zone.
Method of inoculation	: Plug method of inoculation to be done. Inoculations with each isolate to be done on all the varieties with freshly prepared spore suspension. All inoculations to be completed in 2 days by last week of August.
Observation	: One observation at the 60 th day of inoculation.
Evaluation	: The canes are to be split opened longitudinally alalong the point of inoculation. This is graded of the international scale of 0-9.

Result

:

Five new isolates viz., Cf 92012, Co 94012, Cf 95020, Co Si6 and Isolate CoTI 88322 were screened against three standard isolates viz., Cf 6, Cf 4 and Cf 3 for their reaction to red rot to find out whether there is any emergence of new pathotypes. The isolates were inoculated in each of the 14 differentials by plug method of inoculation and the observations were taken on the 60th day after inoculation. All the tested isolates were closely similar to the standard isolates. Hence we can conclude that there is no emergence of any new pathotype of red rot pathogen during the year 2012-13.

Sd/-
Signature of Scientist

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Signature of Head of office

Pathogenic behavior of isolates of red rot pathogen on a set of 14 differentials by plug method

Sl. No	Isolate	Differentials													
		Co 419	Co 975	Co 997	Co 1148	Co 7717	Co 62399	CoC 671	CoJ 64	CoS 767	CoS 8436	BO 91	Baragua	Kakhai	SES 594
1	Cf 6	S	S	S	I	I	I	S	S	R	R	R	R	S	R
2	Cf 4	S	S	S	S	S	I	S	R	R	R	R	R	S	R
3	Cf 3	R	R	S	I	R	R	S	S	R	R	R	R	S	R
4	Co Si6	S	S	S	S	R	S	S	S	R	I	I	R	S	R
5	Cf 92012	S	I	S	I	S	I	S	S	R	R	R	R	R	R
6	Cf 94012	S	I	S	S	I	I	S	S	R	I	R	R	R	R
7	Cf 95020	S	S	S	S	R	S	S	S	R	R	R	R	R	R
8	New isolate (CoTI 88322)	S	I	S	I	I	I	S	S	R	R	R	R	R	R

**KERALA AGRICULTURAL UNIVERSITY
SUGARCANE RESEARCH STATION, THIRUVALLA
ANNUAL REPORT FOR 2012-13**

1. Project No : P.P.22
2. Title: **Survey of sugarcane diseases naturally occurring in the area on important sugarcane varieties.**
3. Objective To gather information on the diseases naturally occurring in the area on varieties for compiling an all India disease status report yearly
4. Location Peninsular zone-Thiruvalla
Sugarcane Research Station, Thiruvalla
5. Year of start 1989-90
6. Technical programme Survey will be conducted in the sugarcane growing areas and to take periodic observations in June, September and December in all locations to gather information on the per cent incidence of diseases on all varieties of the area (General survey)
7. Phase to be covered during the Survey of major diseases occurring in the area on important varieties and their identification period
8. Result : (1). **Red rot:** The disease was observed only in very few pockets.
(2). **Pokkah Boeng:** This disease has been prominently observed consequently for the third year with its first appearance during May month. The leaves are found to turn yellow, become twisted, crinkled and the plant appears to be stunted. But the affected plants are found to recover from the infection by the onset of monsoon. The plants will not turn to top rot infection stage and hence are saved.
(3). **Foliar diseases**
(a). **Ring spot:** This disease is the most common and predominant foliar disease observed even from two months age up to harvest. But proper field sanitation and detrashing at regular interval for two to three times can reduce the incidence of this disease.
(b). **Rust:** Rust disease was observed during this year in a severe form in several varieties. Uredospores were observed as light orange pustules on leaf lamina during the month of August, 2011. The next stage of teliospores was observed as black pustules as raised spots during September, 2011. The severely affected leaves got dried up. But any how the disease subsided by August with the onset of North East monsoon showers.
(4) **Mosaic:** Mosaic is seen commonly in most of the crop varieties, but the disease is not in such a stage to cause any severe yield reduction.
(5) **YLD:** This disease was not so common during previous years. But the disease was appeared to be observed in some varieties this year with its prominent symptoms ending in drying up of the plants.

9. Discussion and summary : In the current year, the incidence of **rust** disease appeared to be more in several varieties. **YLD** disease was also noticed randomly in some plots and in severe stages in some varieties. The other diseases observed as usual were ring spot disease, mosaic as well as pokkah boeng. But none of the diseases were in a severe stage to cause any drastic yield decline.

Sd/-
Signature of Scientist

Sd/-
Signature of Head of office

PP 22: Survey of naturally occurring sugarcane diseases

SI. No	Disease	Name of area surveyed	% Disease incidence	Varieties affected	Crop stage observed	Any other information
1.	Red rot	Iramallikkara, Pandanadu and Thiruvanmandoor of Alleppey district, Kuttor, Nedumbram, Venpala, Niranam and Thengeli of Pathanamthitta district and Aramanoor and Kidangoor of Kottayam district	Mild (Pandanadu)	Madhuri	8 month stage	-
2.	Smut	Disease not present in any area	-	-	-	-
3.	Wilt	Disease not present in any area	-	-	-	-
4.	RSD	Disease not present in any area	-	-	-	-
5.	YLD	Disease started to be recognised	Iramallikkara , Thiruvanvan door, Vallamkulam	Madhuri, Co 6304, Co 74075	6 months	-
6.	Foliar diseases (a). Ring spot	Iramallikkara, Pandanadu and Thiruvanmandoor of Alleppey district, Kuttor, Nedumbram, Venpala, Niranam and Thengeli of Pathanamthitta district and Aramanoor and Kidangoor of Kottayam district	Moderate	Madhuri, Co 7745, Co 6304, Co 72146	2 months onwards	Ring spot is associated with almost all varieties till harvest
	(b). Banded sclerotial disease	Iramallikkara, Pandanadu and Thiruvanmandoor of Alleppey district, Kuttor, Nedumbram, Venpala, Niranam and Thengeli of Pathanamthitta district and Aramanoor and Kidangoor of Kottayam district	Mild	-	2 months onwards	
7.	Other diseases a. Pokkah Boeng	Iramallikkara, Pandanadu and Thiruvanmandoor of Alleppey district, Kuttor, Nedumbram, Venpala, Niranam and Thengeli of Pathanamthitta district and Aramanoor and Kidangoor of Kottayam district	Mild	Madhuri, Co 6304, Co 7745	4-6 months	The disease appears during May month and is found to disappear after shower during July-August
	b. Rust	Kuttor, Nedumbram, Venpala, Niranam and Thengeli of Pathanamthitta district, Aramanoor and Kidangoor of Kottayam	Mild	Madhuri, Co 7745, Co 74075, Co 72146	5-6 month stage	The disease appears during June month.

		district and Pandanadu and Thiruvammandoor of Alleppey district				Uredospores and teliospores are found to arise. The disease subsides during August with the onset of monsoon.
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