ALL INDIA CO-ORDINATED RESEARCH PROJECT ON SUGARCANE

CROP IMPROVEMENT

Technical Programme for the year 2021-22
North Central & East Zones

B. II - Zonal Varietal Trial

Centres (5): Bethuadahari, Buralikson, Motipur, Pusa and Seorahi

1. Initial varietal Trial (Early)

Entries (5)	:	CoP18436,CoP18437,CoP18438,CoSe18451, CoSe18452
Standards (3)	:	CoLk94184,CoSe95422,CoSe01421
Experimental Design	:	Randomized Block Design
Replications	:	Three
Plot Size	:	Gross : 6m x 6r x 0.90m Net : 5m x 4r x 0.90m
Seed rate	:	12 buds/meter
Date of planting	:	February-March
Crop duration	:	10 months
Data to be recorded	:	As per Annexure I

2. Advanced varietal Trial (Early) I plant

Entries(7)	:	CoSe16454,CoP17436,CoP17437,CoP17438, CoP17440,CoP17441,CoSe17451
Standard(3)	:	CoLk94184,CoSe95422,CoSe01421
Design	:	Randomized Block Design
Replications	:	Three
Plot Size	:	Gross : 6m x 8r x 0.90m Net : 5m x 6r x 0.90m
Seed rate	:	12 buds per meter
Date of planting	:	February-March
Crop duration	:	10 months
Data to be recorded		As per Annexure I

3. **Advanced Varietal Trial (Early) – II Plant**

Entries(5)	**:**	CoP16437,CoP16438,CoLk16466,CoLk16468, CoSe16451
Standard (3)	**:**	CoLk94184,CoSe95422,CoSe01421
Design	**:**	Randomized Block Design
Replications	**:**	Three
Plot size	**:**	Gross : 6m x 8r x 0.90m Net : 5m x 6r x 0.90m
Seed rate	**:**	12 buds per meter
Date of planting	**:**	February- March
Crop duration	**:**	10 months
Data to be recorded	**:**	As per Annexure I

4.Advanced Varietal Trial (Early) – Ratoon

Entries(5)	**:**	CoP16437,CoP16438,CoLk16466,CoLk16468, CoSe16451
Standard(3)	:	CoLk94184,CoSe95422,CoSe01421
Design	:	Randomized Block Design
Replications	:	Three
Plot size	:	Gross : 6m x 8r x 0.90m Net : 5m x 6r x 0.90m
Date of Ratooning	:	February- March
Crop duration	:	9 months
Data to be recorded	:	As per Annexure II

5. **Advanced Varietal Trial (Midlate) – I Plant**

Entries(3)	:	CoSe16455,CoP17446,CoSe17452
Standard(3)	:	BO91,CoP06436,CoP9301
Design	:	Randomized Block Design
Replications	:	Four
Plot size	:	Gross : 6m x 8r x 0.90m
		Net : 5m x 6r x 0.90m
Seed rate	:	12 buds per meter
Date of planting	:	February- March
Crop duration	:	12 months
Data to be recorded	:	As per Annexure III

6. **Advanced Varietal Trial (Midlate) – II Plant**

Entries(4)	:	CoP16439,CoLk16470,CoSe16452,CoBln16502
Standard(3)	:	BO91,CoP06436,CoP9301
Design	:	Randomized Block Design
Replications	:	Three
Plot size	:	Gross : 6m x 8r x 0.90m
		Net : 5m x 6r x 0.90m
Seed rate	:	12 buds per meter
Date of planting	:	February- March
Crop duration	:	12 months
Data to be recorded	:	As per Annexure III

7. **Advanced Varietal Trial (Midlate) Ratoon**

Entries(4)	**:**	CoP16439,CoLk16470,CoSe16452,CoBln16502
Standard(3)	**:**	BO91,CoP06436,CoP9301
Design	**:**	Randomized Block Design
Replications	**:**	Three
Plot size	**:**	Gross : 6m x 8r x 0.90m
		Net : 5m x 6r x 0.90m
Date of ratooning	**:**	February- March
Crop duration	**:**	11 months
Data to be recorded	**:**	As per Annexure IV

SEED MULTIPLICATION

(i) Multiplication of pre-zonal entries for seed lifting

The following entries accepted during the group meeting of AICRP(S) held at UAS, Dharwad in 2019are under multiplication at SRI, Pusa. On prior intimation, the coordinating centres should depute their staff to SRI, Pusa and lift the seed material for one year multiplication at their centres.

Early (1) CoBln 19501

Midlate (2) **:**CoSe 18453CoBln 19502

(ii) New entries accepted:

The following entries were accepted during the biennial workshop of AICRP(S) held at ICAR-IISR, Lucknow in 2020. The concerned breeders are requested to supply seed material of their entries for one-year multiplication at S.R.I., Pusa centre.

Early (5) **:** Co 15023, CoP 20436, CoP 20437, CoP 20438, CoLk 20466, CoLk 20467

Midlate (1) **:** CoP 20439, CoP 20440, CoLk 20468, CoLk 20469, CoBln 20501

B.III - Evaluation and identification of climate resilient ISH and IGH genetic stocks

B.III (a)- Evaluation for water logging tolerance (I Plant Crop)

Centres (3): Pantnagar, Motipur and Pusa

Entries (18)	:	ISH501,ISH502,ISH512,ISH519,ISH524,ISH534,ISH536,ISH548,ISH567,ISH584,ISH585,ISH587,ISH590,ISH594,IGH823,IGH829,IGH833,IGH834
Standards (3)	:	Three standards (At least one sensitive and one tolerant checks) may be decided by the centres.
Design	:	Alpha design (please refer layout plan annexed)
Replications	:	Two
Plot Size	:	6m X 2r X 0.90 m
Seed rate	:	12 buds per meter
Planting date	:	Kolhapur and Vuyyuru : 1st fortnight of February Motipur and Pusa : 2nd fortnight of February
Crop Duration	:	12 months
Data to be recorded	:	As detailed below:

i) Germination at 30 days for tropical region and 45 days for sub-tropical region and tillering at 90 days.

ii) Shoot count, Single cane weight, Cane length, Cane diameter, Internode length (average of three middle internodes), number of fully emerged leaves and leaf area/plant just before of water logging, 30 and 60 days after water logging

iii) Juice Brix %, Juice sucrose %, Juice purity %, Extraction %, Cane fibre %, NMC, cane diameter, cane length, single cane weight at 300 and 360 days

iv) Cane and CCS yields at 360 days

v) Arial rooting: Number of nodes with arial roots and intensity of arial roots (Rated as absent, low, medium and high)

vi) Foliage colour (green, light green, pale yellow) at 30 and 60 days after water logging

Weather data:

Rainfall (weekly rainfall)**,** Maximum and Minimum temperature, RH

Imposition of water logging treatment:

1. In case natural water logging fails due to insufficient rains, water stagnation may be ensured (minimum 15 cm) during the grand growth phase (150 – 210 days after planting) / monsoon season.
2. Control plots must be well drained to avoid stagnation of water though out the cropping period.
3. Water level (in cm) above ground level in water logged blocks at 15 days interval after initiation of monsoon.
4. Duration of water logging.

Layout plan for Evaluation and identification of climate resilient ISH and IGH genetic stocks for drought tolerance

Layout

Normal condition:

	Replication 1						
Block 1	11	9	17	6	1	20	15
Block 2	3	5	8	16	10	14	19
Block 3	18	7	13	12	4	2	21

	Replication 2						
Block 1	20	11	14	8	17	2	5
Block 2	21	12	18	3	15	6	9
Block 3	1	10	13	4	7	19	16

Drought condition:

	Replication 1						
Block 1	13	7	10	1	4	16	19
Block 2	8	17	2	20	14	5	11
Block 3	18	15	12	21	3	9	6

	Replication 2						
Block 1	12	2	7	21	13	4	18
Block 2	5	8	19	3	10	16	14
Block 3	11	20	9	17	6	1	15

Name of the clones and serial numbers:

S. No	Clone	S. No	Clone	S. No	Clone
1	ISH 501	8	ISH 548	15	IGH 823
2	ISH 502	9	ISH 567	16	IGH 829
3	ISH 512	10	ISH 584	17	IGH 833
4	ISH 519	11	ISH 585	18	IGH 834
5	ISH 524	12	ISH 587	19	**Check 1**
6	ISH 534	13	ISH 590	20	**Check 2**
7	ISH 536	14	ISH 594	21	**Check 3**

Note: In case one or two entries are missing due to unavailability of seed material, additional checks (other than Check 1, 2, 3) may be taken.

Seed Multiplication: The following ISH/IGH clones should be multiplied in the participating centres during 2021-22 for conducting trial in the year 2022-23.

Drought : Sankeshwar, Pune, Lucknow, Karnal,
Water logging: Motipur, Pantnagar and Pusa

Entries (12): ISH 513, ISH 516, ISH 526, ISH 528, ISH 535, ISH 542, ISH 545, ISH 554, ISH 558, ISH 564, IGH 806, IGH 816

b) Seed multiplication of commercial clones: Waterlogging tolerance

Participating centre: Motipur and Pusa

The following 18 entries of commercial clones will be multiplied at three centres for conducting the trials during the year 2022-23

S.No	Clone	S.No	Clone
1	96 WL 1206	10	WL 10-18
2	WL 10-20	11	WL 10-83

3	99 WL 1028	12	WL 10-105
4	WL 09-965	13	WL 11-2263
5	WL 09-678	14	WL 11-2534
6	WL 10-24	15	WL 12-509
7	WL 10-62	16	WL 12-182
8	WL 10-3	17	WL 12-300
9	WL 10-85	18	Co 99006

Annexure-I

ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE

Characters on which data to be recorded in IVT and AVT Early (Plant crops)

1. Germination % at 30 days for tropics and 45 days for sub-tropics
2. No. of tillers (thousand/ha) at 120 days
3. No. of shoots (thousand/ha) at 240 days
4. Cane yield (t/ha) after 10 months at harvest
5. Number of millable canes (thousand/ha) after10 months at harvest
6. Stalk length (cm) after 10 months at harvest
7. Stalk diameter (cm) after 10 months at harvest
8. Single cane weight (kg) after 10 months at harvest
9. Brix % at 8 and 10 months
10. Sucrose % in juice at 8 and 10 months
11. Purity % at 8 and 10 months
12. CCS % at 8 and 10 months
13. CCS t/ha after 10 months at harvest
14. Extraction % after 10 months at harvest
15. Fibre % after 10 months at harvest
16. Pol % cane after 10 months at harvest
17. Jaggery quality after 10 months at harvest (if facility available)
18. Jaggery yield (t/ha) after 10 months at harvest (if facility available)

Morphological characters

1. Lodging : Erect, lodging, snapping, heavy lodging

2. Leaf sheath spines : Absent (A), present (P), medium (M), heavy (H)
3. Flowering : Absent (A), present (P)
4. Canopy structure and colour : Green, light green, yellowish green, dark green
5. Bud size : Big (B), small (S), medium (M)
6. Pithiness : Absent (A), present (P), less (L), heavy (H)
7. Internode splits : Absent (A), present (P), low (L), moderate (M), heavy (H)
8. Natural incidence of diseases and pests

Annexure-II

ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE

Characters on which data to be recorded in AVT (Early – Ratoon)

Note : 1. No gap filling should be done.

2. Ratooning operation should be completed within 15 days after harvesting plant crop.

1. Number of tillers (thousand/ha) before giving full earthing up (90 days)
2. Number of cane formed tillers (thousand/ha) after 180 days
3. Number of millable canes (thousand/ha) after 270 days at harvest
4. Cane yield (t/ha) after 270 days at harvest
5. Stalk length (cm) after 270 days at harvest
6. Stalk diameter (cm) after 270 days at harvest
7. Single cane weight (kg) after 270 days at harvest
8. Brix % after 270 days at harvest
9. Sucrose % in juice after 270 days at harvest
10. Purity % after 270 days at harvest
11. CCS % after 270 days at harvest
12. CCS t/ha after 270 days at harvest
13. Extraction % after 270 days at harvest
14. Fibre % after 270 days at harvest
15. Pol % cane after 270 days at harvest
16. Jaggery quality after 270 days at harvest (if facility available)
17. Jaggery yield (t/ha) after 270 days at harvest (if facility available)

Annexure-III

ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE

Characters on which data to be recorded in IVT and AVT (Midlate –Plant crops)

1. Germination % at 30 days for tropics and 45 days for sub-tropics
2. No. of tillers (thousand/ha) at 120 days
3. No. of shoots (thousand/ha) at 240 days
4. Cane yield (t/ha) after 12 months at harvest
5. Number of millable canes (thousand/ha) after 12 months at harvest
6. Stalk length (cm) after 12 months at harvest
7. Stalk diameter (cm) after 12 months at harvest
8. Single cane weight (kg) after 12 months at harvest
9. Brix % at 10 and 12 months
10. Sucrose % in juice at 10 and 12 months
11. Purity % at 10 and 12 months
12. CCS % at 10 and 12 months
13. CCS t/ha after 12 months at harvest
14. Extraction % after 12 months at harvest
15. Fibre % after 12 months at harvest
16. Pol % cane after 12 months at harvest
17. Jaggery quality after 12 months at harvest (if facility available)
18. Jaggery yield (t/ha) after 12 months at harvest (if facility available)

Morphological characters

1. Lodging : Erect, lodging, snapping, heavy lodging
2. Leaf sheath spines : Absent (A), present (P), medium (M), heavy (H)
3. Flowering : Absent (A), present (P)
4. Canopy structure and colour : Green, light green, yellowish green, dark green
5. Bud size : Big (B), small (S), medium (M)
6. Pithiness : Absent (A), present (P), less (L), heavy (H)
7. Internode splits : Absent (A), present (P), low (L), moderate (M), heavy (H)
8. Natural incidence of diseases and pests

Annexure-IV

ALL INDIA COORDINATED RESEARCH PROJECT ON SUGARCANE

Characters on which data to be recorded in AVT (Midlate – Ratoon)

Note : 1. No gap filling should be done.

2. Ratooning operation should be completed within 15 days after harvesting plant crop.

1. Number of tillers (thousand/ha) before giving full earthing up (90 days)
2. Number of cane formed tillers (thousand/ha) after 180 days
3. Number of millable canes (thousand/ha) after 330 days at harvest
4. Cane yield (t/ha) after 330 days at harvest
5. Stalk length (cm) after 330 days at harvest
6. Stalk diameter (cm) after 330 days at harvest
7. Single cane weight (kg) after 330 days at harvest
8. Brix % after 330 days at harvest
9. Sucrose % in juice after 330 days at harvest
10. Purity % after 330 days at harvest
11. CCS % after 330 days at harvest
12. CCS (t/ha) after 330 days at harvest
13. Extraction % after 330 days at harvest
14. Fibre % after 330 days at harvest
15. Pol % cane after 330 days at harvest
16. Jaggery quality after 330 days at harvest (if facility available)
17. Jaggery yield (t/ha) after 330 days at harvest (if facility available)