

ALL INDIA CO-ORDINATED RESEARCH PROJECT ON SUGARCANE

CROP IMPROVEMENT

Technical Programme for the year 2022-23 North Central & East Zones

B. II - Zonal Varietal Trial

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

1. Advanced varietal Trial (Early) I plant

Entries (5)	:	CoP 18436, CoP 18437, CoP 18438, CoSe 18451, CoSe 18452
Standards (3)	:	CoLk 94184, CoSe 95422, CoSe 01421
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

2. Advanced Varietal Trial (Early) – II Plant

Entries (7)	:	CoSe 16454, CoP 17436, CoP 17437, CoP 17438, CoP 17440, CoP 17441, CoSe 17451
Standard (3)	:	CoLk 94184 , CoSe 95422, CoSe 01421
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) – Ratoon

Entries (7)	:	CoSe 16454, CoP 17436, CoP 17437, CoP 17438, CoP 17440, CoP 17441, CoSe 17451
Standard (3)	:	CoLk 94184 , CoSe 95422, CoSe 01421
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

4. Advanced Varietal Trial (Midlate) – II Plant

Entries (3)	:	CoSe 16455, CoP 17446, CoSe 17452
Standard (3)	:	BO 91, CoP 06436, CoP 9301
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

5. Advanced Varietal Trial (Midlate) Ratoon

Entries (3)	:	CoSe 16455, CoP 17446, CoSe 17452
Standard (3)	:	BO 91, CoP 06436, CoP 9301
Design	:	Randomized Block Design
Replications	:	Four
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 biennial workshop of AICRP(S) held at ICAR-IISR, Lucknow in 2020 are 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 (6) :CoBln 19501*, Co 15023, CoP 20436, CoP 20437, CoP 20438, CoLk 20466, CoLk 20467

Midlate (2) :CoSe 18453*,CoBln 19502*CoP 20439, CoP 20440, CoLk 20468, CoLk 20469, CoBln 20501

* Entries accepted during the group meeting of AICRP(S) held at UAS, Dharwad in 2019

(ii) New entries accepted:

The following entries were accepted during the biennial workshop of AICRP(S) held at ICAR-IISR, Lucknow in 2021. The concerned breeders are requested to supply seed material of their entries for one-year multiplication at ICAR- IISR Research Centre, Motipur.

Early (8) : CoB 21426, CoB 21427, CoP 21436, CoP 21437, CoP 21438, CoSe 21451, CoLk 21466, CoLk 21467

Midlate (4) : CoP 21439, UP 21452, CoLk 21468, CoLk 21469

B.III (a)- Evaluation and identification of climate resilient ISH and IGH genetic stocks
i) Evaluation for waterlogging tolerance (II Plant Crop)

Centres (3):Pantnagar, Motipur and Pusa

Entries (18)	:	ISH 501, ISH 502, ISH 512, ISH 519, ISH 524, ISH 534, ISH 536, ISH 548, ISH 567, ISH 584, ISH 585, ISH 587, ISH 590, ISH 594, IGH 823, IGH 829, IGH 833, IGH 834
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	:	Pantnagar, Motipur and Pusa : 2 nd 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) Aerial rooting: Number of nodes with aerial roots and intensity of aerial 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:

- a) 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.
- b) Control plots must be well drained to avoid stagnation of water though out the cropping period.
- c) Water level (in cm) above ground level in water logged blocks at 15 days interval after initiation of monsoon.
- d) Duration of water logging.

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

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.

ii) Evaluation for waterlogging tolerance (RatoonCrop)

Centres (3):Pantnagar, Motipur and Pusa

Entries (18)	:	ISH 501, ISH 502, ISH 512, ISH 519, ISH 524, ISH 534, ISH 536, ISH 548, ISH 567, ISH 584, ISH 585, ISH 587, ISH 590, ISH 594, IGH 823, IGH 829, IGH 833, IGH 834
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
Date of ratooning	:	After harvest of Plant crop
Crop Duration	:	11 months
Data to be recorded	:	As detailed below:

- i) 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
- ii) Juice Brix %, Juice sucrose %, Juice purity %, Extraction %, Cane fibre %, NMC, cane diameter, cane length, single cane weight at 270 and 330 days
- iii) Cane and CCS yields at 330 days
- iv) Aerial rooting: Number of nodes with aerial roots and intensity of aerial roots (Rated as absent, low, medium and high)
- v) 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:

- a) 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.
- b) Control plots must be well drained to avoid stagnation of water though out the cropping period.
- c) Water level (in cm) above ground level in water logged blocks at 15 days interval after initiation of monsoon.
- d) Duration of water logging.

Seed Multiplication: The following ISH/IGH clones should be multiplied in the participating centres during 2022-23 for conducting trial in the year 2023-24.

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.III (b)- Evaluation and identification of climate resilient commercial clones

i) Evaluation for waterlogging tolerance (I Plant Crop)

Centres (3):Pantnagar, Motipur and Pusa

Entries (15)	:	96 WL 1206, WL 09-965, WL 09-678, WL 10-62, WL 10-3, WL 10-85, WL 10-18, WL 10-83, WL 10-105, WL 11-2263, WL 11-2534, WL 12-509, WL 12-182, WL 12-300, Co 99006
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	:	Pantnagar, Motipur and Pusa : 2 nd 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) Aerial rooting: Number of nodes with aerial roots and intensity of aerial 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:

- a) 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.
- b) Control plots must be well drained to avoid stagnation of water though out the cropping period.
- c) Water level (in cm) above ground level in water logged blocks at 15 days interval after initiation of monsoon.
- d) Duration of water logging.

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

Normal condition:

REPLICATION 1						
Block 1	11	14	5	2	17	8
Block 2	1	7	4	13	10	16
Block 3	12	9	15	18	3	6

REPLICATION 2						
Block 1	2	10	7	5	18	15
Block 2	8	16	6	13	11	3
Block 3	9	12	14	17	4	1

Water logging condition:

REPLICATION 1						
Block 1	4	16	1	10	13	7
Block 2	14	11	2	17	5	8
Block 3	3	6	15	9	18	12

REPLICATION 2						
Block 1	1	9	17	14	4	12
Block 2	6	13	11	3	16	8
Block 3	18	10	7	5	2	15

Name of the clones and serial numbers:

S.No	Clone	S.No	Clone	S.No	Clone
1	96 WL 1206	7	WL 10-18	13	WL 12-182
2	WL 09-965	8	WL 10-83	14	WL 12-300
3	WL 09-678	9	WL 10-105	15	Co 99006
4	WL 10-62	10	WL 11-2263	16	Check 1
5	WL 10-3	11	WL 11-2534	17	Check 2
6	WL 10-85	12	WL 12-509	18	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.

iv) Seed multiplication of commercial clones: Waterlogging tolerance

Participating centre: Motipur and Pusa

The following three entries of commercial clones will be multiplied at three centres

WL 10-20 99 WL 1028 WL 10-24

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) after 10 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

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.
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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)

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

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)