

**ALL INDIA CO-ORDINATED RESEARCH PROJECT ON SUGARCANE
CROP IMPROVEMENT**

**Technical Programme for the year 2023-24
North West Zone**

B. II - Zonal Varietal Trial

Centres (10) : Faridkot, Karnal, Kota, Lucknow, Kapurthala, Muzaffarnagar, Pantnagar, Shahjahanpur, Sriganaganagar and Uchani

1. Initial Varietal Trial (Early)

Entries (6) : Co 20016, CoLk 20201, CoLk 20202, CoLk 20203, CoPb
20211, CoH 20261

Standard (3) : CoJ 64, Co 0238 and Co 05009

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 per meter

Date of planting : February- March

Time of Harvest : 2nd fortnight of January

Data to be recorded : As per Annexure I

2. Advanced Varietal Trial (Early) – I Plant

Entries (4) : CoLk 19201, CoLk 19202, CoPb 19212, CoS 19231

Standard (3) : CoJ 64, Co 0238 and Co 05009

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

Time of Harvest : 2nd fortnight of January

Data to be recorded : As per Annexure I

2.Advanced Varietal Trial (Early) – II Plant

Entries (4)	:	CoS 17231, CoS 17232, CoPb18181, CoLk 18202
Standard (3)	:	CoJ 64, Co 0238, Co 05009
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
Time of Harvest	:	2 nd fortnight of January
Data to be recorded	:	As per Annexure I

2.Advanced Varietal Trial (Early) – Ratoon

Entries (4)	:	CoS 17231, CoS 17232, CoPb18181, CoLk 18202
Standard (3)	:	CoJ 64, Co 0238, Co 05009
Design	:	Randomized Block Design
Replications	:	Three
Plot size	:	Gross : 6m x 8r x 0.90m Net : 5m x 6r x 0.90m
Date of initiating the ratoon crop	:	February- March
Time of Harvest	:	2 nd fortnight of December
Data to be recorded	:	As per Annexure I

3. Initial Varietal Trial (Midlate)

Entries (8)	:	Co 20017, Co 20018, CoPb 20181, CoLk 20204, CoLk 20205, CoPb 20212, CoS 20231, CoS 20232
Standard (3)	:	CoS 767, CoPant 97222, Co 05011
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 per meter
Date of planting : February- March
Time of Harvest : 2nd fortnight of March
Data to be recorded : As per Annexure III

3. Advanced Varietal Trial (Midlate) – I Plant

Entries (7) : Co 19017, CoPb 19182, CoLk 19204, CoPb 19213, CoPb 19214, CoS19232, CoS 19235,
Standard (3) : CoS 767, CoPant 97222, Co 05011
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
Time of Harvest : 2nd fortnight of March
Data to be recorded : As per Annexure III

4. Advanced Varietal Trial (Midlate) – II Plant

Entries (6) : Co 18022, CoPb 18213, CoPb 18214, CoS 18231, CoS 18232, CoS 18233
Standard (3) : CoS 767, CoPant 97222, Co 05011
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
Time of Harvest : 2nd fortnight of March

Data to be recorded : As per Annexure III

4. Advanced Varietal Trial (Midlate) – Ratoon

Entries (6) : Co 18022, CoPb 18213, CoPb 18214, CoS 18231, CoS 18232, CoS 18233
Standard (3) : CoS 767, CoPant 97222, Co 05011
Design : Randomized Block Design
Replications : Three
Plot size : Gross : 6m x 8r x 0.90m
Net : 5m x 6r x 0.90m
Date of initiation of ratoon crop : February- March
Time of Harvest : 2nd fortnight of February
Data to be recorded : As per Annexure IV

SEED MULTIPLICATION

(i) Multiplication of zonal entries accepted during 2018 for seed lifting

The following entries accepted during the group meeting of AICRP(S) held at ICAR-IISR, Lucknow during 2021 are under multiplication at UPCR, Shahjahanpur. On prior intimation, the participating centres should depute their staff to the Shahjahanpur centre and lift the seed material for one year multiplication at their centres.

Early (10) : Co 21012, Co 21013, Co 21014, CoPb 21181, CoPb 21182, CoLk 21201, CoLk 21202, CoLk 21203, CoPb 21211, CoH 21261

Midlate (10) : CoPb 21183, CoPb 21184, CoLk 21204, CoLk 21205, CoLk 21206, CoS 21231, CoS 21232, CoS 21233, CoH 21262, CoH 21263

(ii). Seed multiplication of new entries

The following entries were accepted during the biennial workshop of AICRP(S) held at ICAR-IISR, Lucknow during 14-15th October, 2022. The concerned breeders are requested to supply seed material of their entries for one year multiplication at UPCR, Shahjahanpur seed multiplication centre.

Early (8):CoPb 22181,CoLk 22201 (LG 17137), CoLk 22202 (LG 17224), CoLk 22203 (LG 17234), CoPb 22211 (K2017-23/3), Co 22020, CoH 22261(S 14-178) and CoH 22262 (S 15-197)

Midlate (16): CoPb 22182, CoPb 22183, CoPb 22184, CoLk 22204 (LG 17213), CoLk 22205 (LG 17214), CoLk 22206 (LG 17219), CoPb 22212 (K2017-49/92), Co 22021, Co 22023, CoS 22231 (S.27/17), CoS 22232 (S.45/17), CoS 22233 (S.161/17), **CoS 22234 (S.434/17)**, CoH 22263 (S 15-2361), CoH 22264 (S 15-19) and CoH 22265 (S 15-377)

B.III - Evaluation and identification of climate resilient ISH and IGH genetic stocks
B.III (b)- Evaluation and identification of climate resilient commercial clones
vii) Evaluation for waterlogging tolerance (II 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

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**Characters on which data to be recorded in Initial Varietal Trial (IVT)
and Advance Varietal Trial (AVT) in Early(Plant crop)**

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 %, Sucrose %, Purity % and CCS % - 2nd fortnight of November and January
10. CCS t/ha after 10 months at harvest
11. Extraction % after 10 months at harvest
12. Fibre% after 10 months at harvest
13. Pol % cane after 10 months at harvest
14. Jaggery quality after 10 months at harvest (if facility available)
15. 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 crop)

- 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 %, Sucrose %, Purity % and CCS % - 2nd fortnight of December
 9. CCS t/ha after 270 days at harvest
 10. Extraction % after 270 days at harvest
 11. Fibre % after 270 days at harvest
 12. Pol % cane after 270 days at harvest
 13. Jaggery quality after 270 days at harvest (if facility available)
 14. 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 Initial Varietal Trial (IVT)
and Advance Varietal Trial (AVT) in Midlate (Plant crop)**

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 %, Sucrose %, Purity % and CCS % - 2nd fortnight January and March
10. CCS t/ha after 12 months at harvest
11. Extraction % after 12 months at harvest
12. Fibre% after 12 months at harvest
13. Pol % cane after 12 months at harvest
14. Jaggery quality after 12 months at harvest (if facility available)
15. 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 crop)

- 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 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 %, Sucrose %, Purity % and CCS % - 2nd fortnight of February
 9. CCS (t/ha) after 330 days at harvest
 10. Extraction % after 330 days at harvest
 11. Fibre % after 330 days at harvest
 12. Pol % cane after 330 days at harvest
 13. Jaggery quality after 330 days at harvest (if facility available)
 14. Jaggery yield (t/ha) after 330 days at harvest (if facility available)