PACKAGE OF PRACTICES BY SBI COIMBATORE

Varieties and their suitability specific area

Variety	Co 0403	Co 06022
Maturity Group	Early	Early
Year of Release	2012	2012 (identified)
Area of adaptability	Peninsular Zone	Peninsular Zone

The variety Co 0403 was released by the CVRC for commercial cultivation in the states of Tamil Nadu, Karnataka, Andhra Pradesh, Kerala, Maharashtra, Gujarat and Madhya Pradesh of the peninsular zone

Field selection and land preparation

- A green manure crop (Daincha or Sesbania) has to be raised prior to sugarcane and incorporated at flowering stage by a disc plough or a rotavator.
- After about two weeks, further deep ploughing once or twice needs to be done followed by harrowing to bring the soil to good tilth.
- In the absence of green manuring, farm yard manure or compost (25 t/ha) need to be applied before last ploughing or in the furrows

Plot size

- For experimental purpose, the minimum plot size per variety should be 8 rows x 6 m long rows x 0.90m /1.2m spacing between rows.
- The number of replication per variety shall be three in randomized block design. For large scale demonstration, it is advisable to increase the number of rows (as many as possible) per variety.

Planting Time

Best time to plant sugarcane in the tropical states is from January to March. The adsali crop is planted from July to September

Spacing

Ridges and furrows are formed at 90 cm. Wider spacing of 120 cm may be followed in fertile soils, and where irrigation water is plenty. The furrows should be 30 cm deep.

Seed Rate

- At 90 cm row to row spacing and @ 12 setts /meter long row, seed requirement per acre would be 35-45 quintals.
- Two bud setts or single bud setts may be used for planting. If single bud setts is used spread the setts at uniform distance @ 12 single setts in one meter long

row. About 53,000-53,500 single bud setts /acre would be required. If two bud setts are used, the seed rate would be 27,000 two bud setts/acre.

Sett treatment

- Always use disease free quality setts for planting.
- Treat the setts either in 0.1% Carbendazim (100 g in 100 litre of water) for 10 minutes or dip the setts in 100 litres of water dissolved with 50g Carbendazim, 200 ml Malathion or Chloryriphos and 1 kg urea for 10 minutes.
- If we want to raise seed crop, treat the unsized cane (whole stalk) in moist hot aerated therapy unit (MHAT) at 54^0C for 2 hr.

Fertilizer doses with time of application

- **Basal manuring:** 10 % of the total recommended nitrogen (30 kg N per ha) and the entire dosage of phosphorus (63 kg P_2O_5per ha) are applied in the furrows and mixed with the soil.
- **Top dressing:** 45% of the nitrogen doses (125 kg N per ha) and 50% of potassium (60 kg K_2O per ha) are applied at 45 days after planting by band placement and partial earthing up is done.
- second top dressing is done at 90 days after planting with remaining 45% of nitrogen (125 kg N per ha) and 50% of potassium (60 kg K_2O per ha) and full earthing up is given
- Soil application of *Azospirillum* or *Glucanoacetobactor* @ 4 kg/acre + *Phosphobacteria* @ 4 kg/acre in two split doses at 30 and 60 days after planting.

Weed management

On 3rd or 4th day after planting Atrazine is sprayed @2.0 kg a.i./ha using a knapsack sprayer. This is followed by hand hoeing and weeding around 40-45 days (before first top dressing).

If broad leaved weeds are present, a post-emergence spray of 2,4-D @ 1.0 kg a.i./ha may be given after one month of planting. Before second top dressing, hand weeding may be done.

Irrigation

Irrigation schedule with 60 mm of water per irrigation is optimum for sugarcane grown in a loamy type of soil.

Stage of the crop	**Interval between irrigations**
Germination (up to 35th day)	7 days
Tillering (36th to 100th day)	10 days
Grand growth (101st to 270th day)	7 days
Maturity (271st day onwards)	15 days

This schedule is for medium type soils. In heavy soils, 10-15 days interval up to grand growth stage, and 15-30 days thereafter.

Earthing up

- Light/partial earthing up at 45 days after planting.
- Final earthing up at 90 days after planting.

Detrashing

should be done once the cane formation takes place, dry and senescent leaves are stripped at 5th and 7th month and may be applied as mulch in alternate furrows.

Disease and pest control

Integrated management of sugarcane disease is best achieved by using disease free seed setts, suitable cultural practices and heat therapy with the Three Tier Seed Nursery programme. To control early shoot borer, spraying of endosulfan and chlorpyriphos 2ml/lit with 450lit of water. Plant protection measure should be need based only.

Harvest

Harvesting should be done at 10 months age.

Observations to be recorded

1. Germination % at 30 days after planting under tropical condition
2. No. of tillers per plot (or ha) at 120 days
3. Number of millable canes per plot (or ha) at 240 days or at harvest
4. Stalk length in cm (ground level to top of stalk-excluding tops) at harvest
5. Stalk diameter (cm) after at harvest
6. Single cane weight (kg) at harvest
7. Brix% at 8 and 10 months for early varieties
8. Sucrose% in juice at 8 and 10 months
9. Purity % at juice at 8 and 10 months
10. CCS % at juice at 8 and 10 months
11. Juice Extraction % at 10^{th} month
12. Fibre % and Pol % cane at harvest
13. Cane yield per plot (or ha) at harvest
14. CCS yield per plot (or ha) at harvest

Guidelines for ratoon management

- **Harvest the crop close to the ground level**. **After harvest irrigate** the field immediately.
- Most of the farmers burn the trashes in field itself. This practice may be avoided. **Trashes add nutrients to the soil.** Remove the trashes and keep it near bunds till stubble shaving and off-barring operations are over and then spread it on the field. Trash mulching conserves soil moisture. Mulched trash can be incorporated into the soil at the time of earthing up.
- **Stubble shaving** is an indispensable operation to raise good ratoon crop. The stubbles protruding above ground level are cut close to the ground using a spade. It will induce underground buds to sprout and establish deeper root system. Apply Chloropyriphos (2 litre/acre in 350-400 litre water) after stubble shaving.

- Cutting sides of the ridges, loosening soils between ridges are the other important operations in ratoon crop. This operation is called **off-baring** or root pruning. It will reduce soil compaction. It can be done manually or using plough or tractor mounted ratoon management device (RMD).
- Ratoons are susceptible to water stress and water logging due to their shallow root. **Give timely irrigation**, avoid excess irrigation and provide proper drainage.
- If there is no cane clump in a distance of 2 feet along a row, it is considered as **gap and should be filled with pre-germinated single bud setts**. A small nursery may be raised in one corner of the field, just a month before harvest of plant crop. The seedling may be used for gap filling. Alternatively, single bud setts can be germinated in polybags and used for gap filling.
- If iron and zinc chlorosis are noticed, give foliar spray of FeSO4 @ 0.25% along with 1% urea + ZnSO4 (0.5%) twice.
- Other cultural practices are same as given for plant crop.

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PACKAGE OF PRACTICES

Varieties and its suitability

Variety	**Co 06030**
Maturity Group	Midlate
Year of Release	2013
Area of adaptability	East coast Zone

The variety Co 06030 was notified by the CVRC for commercial cultivation in the Coastal regions of Tamil Nadu, Andhra Pradesh, and Odisha

Field selection and land preparation

- A green manure crop (Daincha or Sesbania) has to be raised prior to sugarcane and incorporated at flowering stage by a disc plough or a rotavator.
- After about two weeks, further deep ploughing once or twice needs to be done followed by harrowing to bring the soil to good tilth.
- In the absence of green manuring, farm yard manure or compost (25 t/ha) need to be applied before last ploughing or in the furrows

Plot size

- For experimental purpose, the minimum plot size per variety should be 8 rows x 6 m long rows x 0.90m /1.2m spacing between rows.

- The number of replication per variety shall be three. For large scale demonstration, it is advisable to increase the number of rows (as many as possible) per variety.

Planting Time

Best time to plant sugarcane in the tropical states is from January to March

Spacing

Ridges and furrows are formed at 90 cm. Wider spacing of 120 cm may be followed in fertile soils, and where irrigation water is plenty. The furrows should be 30 cm deep.

Seed Rate

- At 90 cm row to row spacing and @ 12 setts /meter long row, seed requirement per acre would be 35-45 quintals.
- Two bud setts or single bud setts may be used for planting. If single bud setts is used spread the setts at uniform distance @ 12 single setts in one meter long row. About 53,000-53,500 single bud setts /acre would be required. If two bud setts are used, the seed rate would be 27,000 two bud setts/acre.

Sett treatment

- Always use disease free quality setts for planting.
- Treat the setts either in 0.1% Carbendazim (100 g in 100 litre of water) for 10 minutes or dip the setts in 100 litres of water dissolved with 50g Carbendazim, 200 ml Malathion or Chloryriphos and 1 kg urea for 10 minutes.
- If we want to raise seed crop, treat the unsized cane (whole stalk) in moist hot aerated therapy unit (MHAT) at 54^0C for 2 hr.

Fertilizer doses with time of application

Basal manuring:

For Tamilnadu**,** 10 % of the total recommended nitrogen (30 kg N per ha) and the entire dosage of phosphorus (63 kg P_2O_5per ha) are applied in the furrows and mixed with the soil.

- **Top dressing:** 45% of the nitrogen doses (125 kg N per ha) and 50% of potassium (60 kg K_2O per ha) are applied at 45 days after planting by band placement and partial earthing up is done.
- second top dressing is done at 90 days after planting with remaining 45% of nitrogen (125 kg N per ha) and 50% of potassium (60 kg K_2O per ha) and full earthing up is given.
- For Andhra Pradesh, Entire dose of phosphorus (100 kg P_2O_5per ha) and Potash (120 kg/ha) should be applied in the furrows.
- Nitrogen (167kg/ha) should be applied in two split doses @ 45 and 90DAP. Trash twist propping 2-3 times depending on the growth of the crop to prevent lodging

- Soil application of *Azospirillum* or *Glucanoacetobactor* @ 4 kg/acre + *Phosphobacteria* @ 4 kg/acre in two split doses at 30 and 60 days after planting.

Weed management
On 3rd or 4th day after planting Atrazine is sparyed @2.0 kg a.i./ha using a knapsack sprayer. This is followed by hand hoeing and weeding around 40-45 days (before first top dressing).

If broad leaved weeds are present, a post-emergence spray of 2,4-D @ 1.0 kg a.i./ha may be given after one month of planting. Before second top dressing, hand weeding may be done.

Irrigation
Irrigation schedule with 60 mm of water per irrigation is optimum for sugarcane grown in a loamy type of soil.
Irrigation should be given once in a week during summer and 15-21 days during rainy season till harvest. If rains are more proper drainage should be provided.

Earthing up

- Light/partial earthing up at 45 days after planting.
- Final earthing up at 90 days after planting.

Detrashing
Detrashing should be done once the cane formation takes place, dry and senescent leaves are stripped at 5th and 7th month and may be applied as mulch in alternate furrows.

Propping:
It is the operation of tying the canes together using the dry leaves and bottom green leaves. It checks lodging of cane. Propping is extensively followed practices in the coastal areas, where sugarcane is more prone to lodging during the northeast monsoon season

Disease and pest control
Integrated management of sugarcane disease is best achieved by using disease free seed setts, suitable cultural practices and heat therapy with the Three Tier Seed Nursery programme. To control early shoot borer, spraying of endosulfan and chlorpyriphos 2ml/lit with 450lit of water. Plant protection measure should be need based only.

Harvest
Harvesting should be done at 12 months age.

Observations to be recorded
1. Germination % at 30 days after planting under tropical condition
2. No. of tillers per plot (or ha) at 120 days
3. Number of millable canes per plot (or ha) at 240 days and at harvest
4. Stalk length in cm (ground level to top of stalk-excluding tops) at harvest
5. Stalk diameter (cm) after at harvest

6. Single cane weight (kg) at harvest
7. Brix% at 10 and 12 months
8. Sucrose% in juice at 10 and 12 months
9. Purity % at juice at 10 and 12 months
10. CCS % at juice at 10 and 12 months
11. Juice Extraction % at 12th month
12. Fibre % and Pol % cane at harvest
13. Cane yield per plot (or ha) at harvest
14. CCS yield per plot (or ha) at harvest

Guidelines for ratoon management

- **Harvest the crop close to the ground level**. **After harvest irrigate** the field immediately.
- Most of the farmers burn the trashes in field itself. This practice may be avoided. **Trashes add nutrients to the soil.** Remove the trashes and keep it near bunds till stubble shaving and off-barring operations are over and then spread it on the field. Trash mulching conserves soil moisture. Mulched trash can be incorporated into the soil at the time of earthing up.
- **Stubble shaving** is an indispensable operation to raise good ratoon crop. The stubbles protruding above ground level are cut close to the ground using a spade. It will induce underground buds to sprout and establish deeper root system. Apply Chloropyriphos (2 litre/acre in 350-400 litre water) after stubble shaving.
- Cutting sides of the ridges, loosening soils between ridges are the other important operations in ratoon crop. This operation is called **off-baring** or root pruning. It will reduce soil compaction. It can be done manually or using plough or tractor mounted ratoon management device (RMD).
- Ratoons are susceptible to water stress and water logging due to their shallow root. **Give timely irrigation**, avoid excess irrigation and provide proper drainage.
- If there is no cane clump in a distance of 2 feet along a row, it is considered as **gap and should be filled with pre-germinated single bud setts**. A small nursery may be raised in one corner of the field, just a month before harvest of plant crop. The seedling may be used for gap filling. Alternatively, single bud setts can be germinated in polybags and used for gap filling.
- If iron and zinc chlorosis are noticed, give foliar spray of FeSO4 @ 0.25% along with 1% urea + ZnSO4 (0.5%) twice.
- Other cultural practices are same as given for plant crop.

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PACKAGE OF PRACTICES

Varieties and its suitability

Variety	Co 0118	Co 0237	Co 0238	Co 0124	Co 05011	Co 06034
Maturity Group	Early	Early	Early	Midlate	Midlate	Midlate
Year of Release	2009	2012	2009	2010	2012	2014 (identified)
Area of adaptability*	NWZ	Water logged area of NWZ	NWZ	Fertile soils in NWZ	NWZ	NWZ

The above varieties were released by the CVRC for commercial cultivation in North Western Zone of India comprising the State of Rajasthan, Haryana, Punjab, Uttarakhand, Western and Central Uttar Pradesh.

Field selection and land preparation

- These varieties can be grown in soil where other varieties of sugarcane are grown. However,

(i) avoid problem soils like saline, alkaline soil, water-logging area (except Co 0237 which can be grown under water logging condition),
(ii) the land should have provision for irrigation,
(iii) give two preparatory ploughing with disc plough or MB plough followed by cultivators twice,
(iv) give one time operation with rotovator to pulverize the soil and to get fine tilth, free of weeds and stubbles and
(v) level the land using laser leveler.

Plot size

- For experimental purpose, the minimum plot size per variety should be 8 Rows x 6 m long rows x 0.75 or 0.90 cm spacing between rows.
- The number of replication per variety shall be 3. For large scale demonstration, it is advisable to increase the number of rows (as many as possible) per variety.

Planting Time

These varieties are suitable for both autumn and spring planting. The ideal planting time is:

- For Autumn season: Last fortnight of September to first fortnight of October.
- For Spring season Mid February to end of March.

Spacing

- 75 cm in less fertile soil.
- 90 cm in fertile soil and under spring season.

Seed Rate

- At 90 cm row to row spacing and @ 12 setts /meter long row, seed requirement per acre would be 35-45 quintals.
- Two bud setts or single bud setts may be used for planting. If single bud setts is used spread the setts at uniform distance @ 12 single setts in one meter long row. About 53,000-53,500 single bud setts /acre would be required. If two bud setts are used, the seed rate would be 27,000 two bud setts/acre.

Sett treatment

- Always use disease free quality setts for planting.
- Treat the setts either in 0.1% Carbendazim (100 g in 100 litre of water) for 10 minutes or dip the setts in 100 litres of water dissolved with 50g Carbendazim, 200 ml Malathion or Chloryriphos and 1 kg urea for 10 minutes.
- If we want to raise seed crop, treat the unsized cane (whole stalk) in moist hot aerated therapy unit (MHAT) at 54^0C for 2 hr.

Manures

- Apply well decomposed FYM or Compost @ 4-5 tonnes /acre before last ploughing and incorporate in the field. Grow green manure crop like Sesbnaia, Daincha (13 kg seed /acre) or green gram (6 kg seed/ acre) before taking sugarcane and incorporate *in situ* using tractor drawn disc harrow.
- Soil application of *Azospirillum* or *Glucanoacetobactor* @ 4 kg/acre + *Phosphobacteria* @ 4 kg/acre in two split doses at 30 and 60 days after planting.

Fertilizers

- Apply as per soil test report and as per the recommendation of the State. In the absence of soil test report follows the blanket recommendation of 60:20:20 kg NPK /acre for plant crop and 90: 20: 20 kg NPK/acre for ratoon.
- Apply 50 kg DAP and 33 kg MOP /acre before planting in furrows. Apply 50 kg urea/acre at 45 days after planting. Apply 50 kg urea/acre at 90 DAP and give earthing up.

Weed management

- Immediately after planting apply pre-emergence herbicide Atrazine @ 2 kg/acre in 350-400 litre water. Atrazine should be applied only if the field is moist. If vegetables, pulses and oilseeds are intercropped with sugarcane, do not use Atrazine. In such case, spray either Metribuzin (Sencor) @ 0.3 kg /acre or Alachlor or Oxyfluorfen (Goal) @ 0.5 litre/acre. In wheat + sugarcane cropping system use Isoproturon (Garaminon) @ 0.4 kg a.i./acre.
- Hand weeding at 45 DAP followed by two time interculture at 60 and 90 days will control weeds.
- Post emergence application of 2,4-D @ 0.4 kg/acre may be resorted if the problems of dicot weeds (broad leaved weed) do persist.

Irrigation

- At 10-15 days interval during pre-monsoon season.
- As per the need during monsoon season.
- At 20-25 days interval during post-monsoon season.

Earthing up

- Light/partial earthing up at 90 days after planting.
- Final earthing up during June end or before the onset of monsoon.

Propping

- First propping during July end or August depending on growth of crop.
- Second propping during August end or before 2nd fortnight of September.

Insect-Pest Management

- At the time planting: Using a Rosecan apply 2 litre Chlorpyriphos per acre in 350-400 litre water over the setts placed on furrows to control termite and early shoot borer.
- During April to July: During April-May give root drenching of Rynayxypyr 20SC @ 150 ml/acre with 400 litre water to control top borer or apply Furadon @ 13 kg/acre during last week June or first week of July.
- During August: If root borer problem is noticed apply Chlorpyriphos @ 2 litre/acre with 400 litre of water.
- Follow integrated pest management (IPM)

Disease Management

Use of resistant varieties, healthy seeds and adoption of integrated pest and disease management would minimize the incidence of major diseases.

Harvest

- Early maturing variety will be ready for harvest from 10th month.
- Midlate varieties will be ready for harvest from 11th month onwards.

Observations to be recorded

1. Germination % at 45 days after planting under sub-tropical condition
2. No. of tillers per plot (or ha) at 120 days
3. Number of millable canes per plot (or ha) at 240 days or at harvest
4. Stalk length in cm (ground level to top of stalk-excluding tops) at harvest
5. Stalk diameter (cm) after at harvest
6. Single cane weight (kg) at harvest
7. Brix% at 8 and 10 months for early varieties and 10, 12th month for midlate varieties
8. Sucrose% in juice at 8 and 10 months for early varieties and 10, 12th month for midlate varieties
9. Purity % at juice at 8 and 10 months for early varieties and 10, 12th month for midlate varieties
10. CCS % at juice at 8 and 10 months for early varieties and 10, 12th month for midlate varieties
11. Juice Extraction % at 10th month for early and 12th month for midlate varieties
12. Fibre % and Pol % cane at harvest (Optional)
13. Cane yield per plot (or ha) at harvest
14. CCS yield per plot (or ha) at harvest

Guidelines for ratoon management

- Harvest plant crop when weather condition is ideal for stubble sprouting. Autumn planted cane when harvested early in the crushing season gives better sprouting. **Harvest the crop close to the ground level**. **After harvest irrigate** the field immediately.
- Most of the farmers burn the trashes in field itself. This practice may be avoided. **Trashes add nutrients to the soil.** Remove the trashes and keep it near bunds till stubble shaving and off-barring operations are over and then spread it on the field. Trash mulching conserves soil moisture. Mulched trash can be incorporated into the soil at the time of earthing up.
- **Stubble shaving** is an indispensable operation to raise good ratoon crop. The stubbles protruding above ground level are cut close to the ground using a spade. It will induce underground buds to sprout and establish deeper root system. Apply Chloropyriphos (2 litre/acre in 350-400 litre water) after stubble shaving.
- Cutting sides of the ridges, loosening soils between ridges are the other important operations in ratoon crop. This operation is called **off-baring** or root pruning. It will reduce soil compaction. It can be done manually or using plough or tractor mounted ratoon management device (RMD).
- Ratoons are susceptible to water stress and water logging due to their shallow root. **Give timely irrigation**, avoid excess irrigation and provide proper drainage.
- If there is no cane clump in a distance of 2 feet along a row, it is considered as **gap and should be filled with pre-germinated single bud setts**. A small nursery may be raised in one corner of the field, just a month before harvest of plant crop. The seedling may be used for gap filling. Alternatively, single bud setts can be germinated in polybags and used for gap filling.
- If the incidence of black bug noticed during April-May, spray Dichlorvos @1ml/lit of water or Monocrotophos @1.5-2 ml/lit of water during early morning. Direct the spray fluid inside the whorls so that the spray fluid will reach nearer to the hiding nymphs and adults.
- **Apply 90:20:20 kg NPK/acre**. Apply full dose of P, K and 1/3 N at basal. Apply the remaining N in two split doses at 45 and 90 days after ratooning. If iron and zinc chlorosis are noticed, give foliar spray of FeSO4 @ 0.25% along with 1% urea + ZnSO4 (0.5%) twice.
- Other cultural practices are same as given for plant crop.

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PACKAGE OF PRACTICES BY PAU FARIDKOT

Package of Practice (Punjab) for Sugarcane Variety – CoPb 91

CoPb 91 (2014): The canes of this variety are tall, thick and yellow green in colour. The average cane yield is 410 quintals per acre. Its juice contains 17% sucrose in the month of January. It is tolerant to the prevalent pathotypes of red rot disease. It is a good ratooner.

Agronomic Practices

Land Preparation:

Give four to six ploughings to produce good tilth. Each ploughing should be followed by planking. Use a furrow turning plough for the first ploughing.

Sub Soiling:

Cross sub soiling at 1.0m spacing should be done once in three to four years before preparing the field. This is done by tractor drawn sub-soiler to the depth of 45-50 cm. Do planking to break the clods and then prepare seed bed. This will help in breaking the hard pan, help in increasing water infiltration rate and better penetration of sugarcane roots.

Seed Selection:

Use 20 thousand three –budded sets or 15 thousand four-budded sets or 12 thousand five-budded sets per acre. Longer sets are particularly good for rain-fed conditions. In other words, 30-35 qtls of seed depending upon the variety is required for sowing one acre sugarcane crop.

Seed Treatment:

To improve germination, dip the cane sets in 0.25% or Emisan 6 or Bagalol 6 or 0.25 per cent solution of Tilt 25 EC or water soaking for 24 hours before planting i.e. 250g of Emisan 6 or Bagalol 6 or 250ml of Tilt 25 EC in 100 litres of water to treat cane seed for one acre. Take out the seed sets immediately after dipping them in the solution.

Soil Application of pesticides:

Sprinkle 2 litres of Lindane/Kanodane/Markdane/Gammax 20 EC (gamma BHC) diluted in 500 litres of water per acre with a sprinkling can or apply 7.5 kg granules of Sevidol 4:4G (gamma BHC+Carbary) or apply 10 kg Regent/Mortel 0.3G (fipronil) per acre over seed sets in furrows before covering them with soil for the control of termites. Application of Regent/Mortel 0.3G (fipronil) also protects the crop from attack of early shoot borer. Or apply 10 kg Regent/Mortel 0.3G (fipronil) or Padan/Caldan/Kritap 4G (Cartap hydrochloride) mixed in 20kg moist soil/sand or 150 ml Coragen 18.5 SL (chlorantraniliprole)* (adhoc) or 45 ml Imidagold 17.8 SL (imidacloprid) or 2 litres of Durmet/ Classic/Dursban/Markpyriphos 20 EC (chlorpyriphos) in 400 litres of water/acre with sprinkling can along the rows at post germination stage (about 45 days after planting).Earth up slightly and follow with light irrigation. This treatment will protect the germinating crop against the attack of termites and shoot borer and also increase the efficiency of nitrogen.

Time of Planting:
Mid-February to the end of March is the optimum time for planting sugarcane in the Punjab.

Spacing and Method of Planting:
Plant in rows 75cm apart and give planking. The tractor drawn sugarcane planter can also be used for planting. Use two-row tractor operated sugarcane cutter planter. The complete sugarcane which is fed by the labour sitting on the machine is cut automatically into pieces before dropping into the furrows. Fertilizers and chemicals are also applied simultaneously. The seed rate varies from 32 to 35q/acre. The labour requirement is 33 man-h/2.5 acre. Length of sets varies from 23 to 42 cm. The speed of operation is 1.20 to 1.90 kg/h. The capacity of machine varies from 2-3 acres/day. The machine can save about 25% cost of operation in comparison to traditional method. Use this machine on custom hiring basis.

Adopt paired row trench planting for saving irrigation water. Plant two rows of sugarcane in 30 cm broad and 20-25 cm deep trenches. Place the cane sets at the bottom of the trenches and cover with the soil left in between two rows. Distance between two trenches should be 90 cm. Trenches can be drawn using newly developed tractor operated PAU designed trencher. In addition to water saving, this method gives comparatively higher can yield, easy propping up operation and reduces lodging.

Adopt trench planting to save the crop from lodging. Make 20-25 cm deep trenches with a tractor-drawn ridger. Place the cane sets at the bottom of the trench and cover with a 5 cm of soil layer. Apply irrigation immediately and again 4 or 5 days afterwards.

Sugarcane can also be planted in standing wheat crop sown by furrow irrigated raised bed (FIRB) planter. The furrow should be reshaped in, January to loosen the soil. Apply irrigation in reshaped furrows preferably in the evening before planting. Plant sugarcane sets the next day by pressing into the soil manually. Sugarcane is planted in pre-opened furrows between the beds, using treated 3 budded sets, during the second fortnight of February to March.

Fertilizer Application:
These recommendations are valid for medium fertility soils

***Nutrients (kg/acre)**			**Fertilizers (kg/acre)**	
Crop	**N	Urea	Urea	Single superphosphate
Plant Crop	60	as per soil test	130	as per soil test
Ratoon Crop	90	as per soil test	195	as per soil test

*These nutrients can also be supplied from other fertilizers available in the market. If the soil test is low apply 12 kg Phosphorus/acre.
**Reduce the Nitrogen dose from 60 to 45 kg if sugarcane is grown after potato crop.
Note: Sugarcane dose not respond to potash in Punjab

Method of Application:
(i) Plant Crop: Apply one half dose of nitrogen as top dressed/drilled alongside the cane rows with first irrigation after germination. Top dress or drill the

remaining half dose of nitrogen alongside the cane rows in May or June. Apply full dose of phosphorus (based on soil test) in furrows below the cane sets at the time of planting.

(ii) Ratoon Crop: Top-dress one third of nitrogen in February with the first hoeing, one-third in April and the remaining one-third in May. Phosphorus (on the soil-test basis) should be drilled along the cane rows at the time of first cultivation in February.

Weed Control:
Two or three hoeing are necessary to keep down the weeds. Hoeing can be economically done with a bullock-drawn horse-hoe/plough/triphali or with a tractor-drawn tiller. The spreading of trash-blanket between the cane rows after the emergence of the shoots helps to suppress weeds. This practice has the added advantage of conserving soil moisture particularly in rainfed areas.

Chemical Weed Control:
It is economicalto control weeds with herbicides. A pre-emergence application of Sencor 70 WP (Metribuzin/Tafazine (simazine)/Atrataf 50 WP/Solaro 50 WP/Masstaf 50 WP/Markazine 50 WP (Atrazine)/Karmex 80 WP/Klass 80 WP (Diuron) @ 800 per acre in 225 litres of water within two or three days of planting effectively controls the broadleaf weeds and annual grasses. For control of hardy weeds *BansPatta (Brachiariareptans)* use only Sencor 70 WP (Metribuzin)/ Karmax 80 WP/Klass 80 WP (Diuron). For fields infested with dila*(Cyprus rotundus),* one post-emergence application of 2,4 D (sodium salt 80%) @ 800 g per acre in 225 litres of water is recommended. In fields infested with *Ipomoea*sp (climbing vel) and other broad leaf weeds, apply 2, 4 D (sodium salt 80%) @ 800 g/acre of 2,4 D (amine salt 58%) @ 400 ml/acre by dissolving in 225 litres of water when these weeds are in 3 to 5 leaf stage.

Irrigation and Drainage:
Because of dry and not season, April to June is the most critical period for the growth of sugarcane. During this period, irrigate the crop at 7 to 12 days interval. During the rainy-season, adjust the frequency of irrigation according to rainfall. Drain away excess water from the sugarcane fields if these get flooded during the rainy season.

During winter (November to January), irrigate the crop at monthly intervals. To save the crop from frost, apply one irrigation around mid-December and another in the first week of January.

Straw Mulching:
After germination is complete by mid-April, spread uniformly paddy straw or rice husk or sugarcane trash or tree leaves at the rate of 20-25 quintals per acre between the rows of canes. Mulching reduces soil temperature and conserves soil moisture. It also suppresses weeds and reduces the incidence of shoot-borer. Straw mulching increases the yield of sugarcane both under rainfed and irrigated conditions.

Plant-Protection Measures

1. Insects-Pests

Pyrilla:

Pyrilla reduces cane yield and sugar recovery heavily. When the attack is severe it becomes difficult to make *gur*. This pest appears in April-May and again August-September. The leaves of the damaged crop turn yellow. Later on owing to the development of a fungus, the crop turns black and the tops become unfit for feeding to cattle. The incidence of this pest is particularly high in a luxuriant crop and in the interior of field.

Whitefly:

The damaged crop looks pale during August-October. The leaves turn black owing to the development of a fungus. The underside of the leaves is full or nymphs and pupae which suck the sap from the leaves. Spray the crop with 40 ml Confidor 200 SL (imidacloprid) or 600 ml Hostathion 40 EC (triazophos) in 150 litres of waterper acre with a manually operated sprayer.

Black bug:

The attacked crop looks pale. The black adults and pink young nymphs suck the sap from the leaf-sheaths. This pest is active during April to June. Spray the crop with 350 ml of Dusban/Lethal/Massban 20 EC (chlorpyriphos) in 400 litres of water per acre with manually operated sprayer. Direct the spray material into the leaf-whorl.

Sugarcane mite:

The mite appears from April to June and feeds on the lower side of the leaves under a fine web. The leaves turn red and later appear to be burnt. The growth of the affected crop is retarded during the pre-monsoon period. Baru*(Sorghum halepens*) is the alternative host plant from which this mite spreads to the sugarcane crop. So destroy the weed, if growing near the sugarcane fields.

Sugarcane thrips:

The thrips damage the crop from April to June, This pest suck the sap from the partly opened leaf and tips of the younger leaves, resulting in withering and drying of leaftip, which get rolled inwardly. The thrips prefer plant crop than ratoon crop.

Termite:

The termite appears during April to June and again in October. It destroys the germinating buds and causes the drying up of shoots after germination. To avoid its attack, apply only well-rotten farmyard manure and remove the stubbles and debris of previous crop from the field. For the control of termites sprinkle 2 litres of Lindane / Kanodane / Markdane / Gammax 20 EC (gamma BHC) diluted in 500 litres of water per acre with a sprinkling can or apply 10 kg Regent 0.3 G (fipronil) per acre or apply 7.5 kg granules of Sevidol 4:4 G (gamma BHC+carbaryl) or 15 kg Kanodane1.3 DP mixing in 20 kg moist sand/soil before the sets are covered with soil by planking. At post germination stage (about 45 days after planting) the chemical control measures against termite are the same as given under the shoot-borer.

Early shoot-borer:

This pest appears from April to June and causes dry dead-hearts which can be easily pulled out. To control it,

1 Plant the crop early, i.e. before the middle of March.

2 Apply 10 kg granules of Regent/Mortel 0.3 G (fipronil) before the sets are covered with soil by planking.

OR

Apply 10 kg of granules of Padan/Caldan/Kritp 4 G (cartap hydrochloride) or 10 kg Regent/Mortel 0.3 G (fipronil) mixed in 20 kg moist sand/soil or 150 ml Coragen 18.5 SC (chlorantraniliprole)* (adhoc) or 45 ml Imidagold 17.8 SL (imidcloprid) or 2 litres of Durmet/Classic/Dursban/Markpyriphos 20 EC (chlorpyriphos) in 400 litres of water/acre with sprinkling can along the rows at post-germination stage (about 45 days after planting).Earth up slightly and follow with light irrigation.

OR

Use Tricho-card having 20,000 eggs of *Corcyra cephalonica* parasitized (seven days old) by *Trichogrammachilonis* per acre at 10 days interval from mid-April to end June. These eggs are fixed on cards of 10X15 cm size. Cut the cards into 40 pieces/strips, each having approximately 500 parasitized eggs. Staple these pieces, strips on the lower surface of the leaves uniformely at 40 spots per acre during evening hours. Normally 8 releases are required. The tricho-cards should not be stapled on rainy days.

Top-borer:

This pest appears from March to October and causes severe damage during July-August. The central leaf of the cane top dries up and turns dark. The other typical symptoms are the shot-holes in the leaf, white or red streaks on the upper side of the leaf midrib and bunchy tops from July onwards. To control it, 1. Collect and destroy its moths and egg-clusters. 2. Cut the attacked shoots at the ground level from April to June. 3. Use Tricho-card having 20,000 eggs of *Corcyra cephalonica* parasitized (seven days old) by *Tricogrammajapopnicum* per acre at 10 days old interval from mid- April to end-June. The method to use these cards is given under early shoot borer.

Apply10kg granules of Ferterra 0.4GR* or 12kg furadan / Diafuran / Furacarb / Carbocil / Furyencapsulated 3G (carbofuran) or Thimet / Foratox / Granutox / Phoril / Volphor / Umet encapsulated 10 G (phorate) at the base of the shoots in the last week of June or in the first week of July only if the top borer damage exceeds 5% level. Earth up slightly to check the granules from flowing with the irrigation water and irrigate the crop immediately. This operation will control the third brood of the top-borer which does the maximum damage. Take the following precautions in using carbofuran and phorate:

i) Use rubber gloves while applying carbofuran / phorate granules. Never handle these granules with bare hands.

ii) Mix it with the moist soil to reduce the chances of its falling into the eyes of the person applying it.

iii) The person applying these granules should not eat or drink anything without washing his hands thoroughly with soap

iv) Carbofuran / phorate treated sugarcane grasses and weeds should not be fed to cattle for about one month after the treatment.

* Chemicals belong to green chemistry category

Gurdaspur borer:
This borer appears from June to October and causes the withering of the central leaves (notably the 5th leaf) followed by the total drying up of the tops. The affected canes break at the point of attach with a slight jerk. Rogue out canes showing withered tops in the afternoon every week from June to September. The tops should be cut off well below the point of attack. The timely rogueing of affected plants is very important for controlling the pest. Bury the regued-out plants. Do not ratoon a heavily affected crop. Plough up the fields not meant for ratooning and destroy the stubbles before June.

Stalk borer or Tarai borer:
This pest is active throughout the year. The larvae overwinter in the stubble and water-shoots. The attack remains low during April-June and increases in July. Its incidence is highest during October-November. There are no outward symptoms of the attack of this pest. Entrance or exit holes on the attacked canes can be seen only after stripping. A larva sometimes damages upto 3 nodes and the cane may be attacked at several places. The cane yield and sugar recovery are adversely affected in the case of serious attack. The control measures against the pest are as under:

1. Do not use the cane-seed from the infested field.
2. Staple 40 Tricho-cards (5 cm x 2.5 cm) hard paper piece glued with 7 days old eggs of laboratory bost. *Corcyra cephalonica* parasitized by *Trichogrammachilonis* to the under-sides of sugarcane leaves from July to October at 10 days interval. Each card should have approximately 500 parasitized eggs and be spread uniformally at 40 spots per acre. Normally 10-12 releases are required.
3. At harvest, do not leave the water-shoots in the field.
4. Do not ratoon a heavily infested crop. Plough the affected fields, collect the stumps and destroy.

Rats:
Being a long duration crop, sugarcane provides an excellent shelter to rats and suffers heavy damage. The rat, *Bendicotabengalensis*, which digs extensive burrows with characteristic soil heaps, is often abundant in sugarcane. A lodged crop gets highly damaged. For effective rat control in sugarcane, see New Chapter; Control of Rats and Mice'.

2. Diseases
Red rot:
Red rot is caused by the fungus *Colletotrichumfalcatum*. The disease appears from July till the crop is harvested. The third or fourth leaf of cane top shows yellowing at first while rest of the leaves also loose colour afterwards and dry up. Later, the whole clump dries up. On splitting open the cane, the tissue is found to be reddened but the discoloration is not uniform and is interspersed with white patches running across

the width of the split cane. The pith of affected cane emits alcoholic smell. The control measures against this disease are as under:

(i) For planting use seed from absolutely disease free seed plot.
(ii) Do not plant sugarcane in the disease affected fields for one year.
(iii) Grow varieties fairly resistant to red rot.
(iv) Crush the affected crop early and plough up the fields soon after harvesting the crop. Collect and burn the stubbles.
(v) Rogue out and bury or burn the diseased canes. Uproot the entire clumps and not merely the affected stalks.
(vi) Do not ratoon the diseased crop.

Wilt:
This disease is caused by *Cephalosporiumsacchari* or *Fusariummoniliforme*. It appears from July till the crop is harvested. The leaves of the affected cane at first turn yellow and finally the top dries up. On splitting open a diseased cane, the pith shows a dirty red discoloration. Near the nodes, the discoloration is invariably darker than that in the remaining portion of the internodes. The affected stalks become light and hollow. The control measures against this disease are the same as those of red rot. As the causal fungus persists in the soil over long period, the affected field should not be put under sugarcane for 3 years.

Smut:
Smut is caused by *Ustilagoscitaminea*. This disease is prevalent throughout the year but is severe from May to July and again in October-November. Its incidence increases in the ratoon crop. It is easily recognized by the appearance of long whip-like shoots covered with dusty black mass of spores. These whips may arise from the top of the canes as well as from the lateral sprouted buds. Adopt the following control measures:

(i) Use only smut free canes for seed. Reject even the healthy looking canes in the diseased stools or those growing in the vicinity of the smutted clumps.
(ii) Remove the smutted whips gently (without shaking) after putting them inside a closely woven drill bag. Then uproot the entire diseased clumps and burn or bury them deep. Immerse the bag used for collecting the smutted whips in boiling water for 5 minutes after every rogueing of the crop.
(iii) Do not ratoon the smutted crop.
(iv) For surface disinfestations of seed cane (See Seed treatment).

Ratoon Stunting:
A coryniform bacterium (*Clavibacterxyli*) has been found to be associated with the disease. The affected crop remains stunted with thin canes. The leaves are comparatively pale and the roots are poorly developed. The disease can be identified by slicing mature canes longitudinally a little below the rind with a sharp knife. In the lower part of the node, parallel to the zone of the whitish waxy band, the pith shows discolored dots, commas and straight or bent streaks upto 2 to 3 mm in length. They may be yellow, orange, pink, red or reddish brown. Do not use the diseased crop for planting. Select the cane-seed from a vigorously growing and

healthy crop. The moist hot air treatment of seed canes at 54^0C for 4 hours is effective in destroying the causal organism. Do not ratoon the diseased crop.

Grassy Shoot Disease:
The disease is caused by mycoplasma like bodies. The affected plants give rise to numerous thin tillers, the leaves become reduced in size, thin and narrow and usually turn chlorotic. If the attack is light, one or two weak canes may be formed. Uproot and destroy the affected clumps immediately after appearance. The moist hot air treatment of the seed-canes at 54^0C for 4 hours inactivates the causal organisms of this disease. Its incidence increases in the ratoon crop, therefore, do not ratoon the diseased crop.

Red Stripe:
Red stripe is a bacterial disease caused by *Pseudomonas rubrilineans*. It appears during June-August. The affected leaves show bright red streaks which are long, narrow and run longitudinally on the leaf-blade, causing the rotting of tops in severe cases. Rogue out the affected canes and burn or bury them.

Top Rot (Pokkah Boeng):
This disease is caused by *Fusariummoniliforme*. It appears during the rainy season from July to September. The young leaves in the top portion of the plant become chlorotic at the base and get distorted and shortened. They turn dark red and fall off gradually. In severe cases, the rotting of the top portion of the cane occurs. Remove the affected clumps and bury them.

Stinking Rot:
This rot is caused by *Pseudomonas aeruginosa*. The disease appears during the rainy season from July to September. The cane tops dry with the rotting of upper portion or the whole of the stalk. A diseased cane emits a foul smell. Rogue out and burn the severely attacked canes.

Leaf Scald:
The disease is caused by the bacterium *Xanthomonasalbilineans*. Whitish or cream coloured one or two narrow stripes are observed on the leaf extending sometimes down to leaf sheath. The affected plants produce side-shoots starting first from lower nodes with similar stripes on young leaves. The stripes become reddish and later the leaves start withering from top downwards giving scalded appearance. On splitting open the affected canes, reddish brown vascular streaks are observed in the internodes. Sometimes affected plants suddenly wilt and die without any obvious internal symptoms. As the disease is set-borne, healthy and disease free seed should be planted. Treatment of seed-cane with moist hot air at 54^0C for 4 hours inactivates the bacterium. Sterilization of cutting knives by flaming or by dipping in 2% Lysol solution during seed preparation should be practiced to minimize spread of the disease. Rogue out the diseased clumps.

PACKAGE OF PRACTICES BY UPCSR SHAJAHANPUR

A. **Recommended Agronomy for the varieties i.e** CoSe 01434, CoS 08272, CoS 08279, CoS 08276, CoS 03251.

1. **Planting time in different zone of Uttar Pradesh**

Zone	Autumn Planting	Spring Planting
Eastern Zone	Mid Sep to Oct	Mid Jan to Feb
Central Zone	Mid Sep to Oct	Mid Jan to Mar
Western Zone	Mid Sep to Oct	Mid Feb to Mid Apr

2. **Seed rate** – 60 q/hac or 10 -12 buds/meter
3. **Sett size** – 2 budded
4. **Spacing** – 90 cm
5. **Fertilizer** – 200 kg N/hac + 80 kg P_2O_5 /hac + 60 kg K_2O and 25 kg Zinc sulphate/hac
6. **Irrigation** – 6 to 7 irrigation
7. **Control major for insect pests**
    a) Application of Chloropyriphose 20% EC @ 5lt/hac dissolved in 1875 lt of water over cane setts at planting or Phorate 10G @ 25 kg /hac or Regent @ 20 kg/hac at planting against shoot borer and termite.
    b) Drenching of Coragen 18.5% SC @ 375 ml/hac dissolved in 1000 lt of water in the first week of May against shoot borer, top borer (2^{nd} and 3^{rd} brood)
    c) Application of Carbofuran 3G @ 33 kg/hac during last week of June against 3^{rd} brood of top borer, if coragen is not applied.
    d) Foliar application of Chlorpyriphos 20% EC @ 800 ml/hac dissolved in 625 lt of water against Pyrilla population, if parasites of pyrilla are not appeared in the field.
    e) Release of Trichocards @ 50000 adults/hac (2.5 cards) at fortnightly intervals from July to September against Stalk borer, Root borer, Gurdaspur borer and Top borer
    f) Application of Beauveria bassiana and Metarrhizium anisopliae @ 5 kg/hac mixed with FYM or decomposed pressmud (2.5 quintals) containing 20% moisture at the time of planting and in the first week of June against White grub and termite respectively.

PACKAGE OF PRACTICES BY CCSHAU HISAR

Package and practices of varieties CoH 160 (early maturing) and CoH 167 (Mid maturing) identified by CCSHAU, HIsar

CoH 160

Fertilizers:

- 25 % higher than recommended NPK i.e. 187.5+62.5+62.5 N+P2O5+K2O/ha (**Plant crop)**
- Apply full dose of P and K and 1/3rd N at the time of planting in furrows and remaining N in two equal splits in May and June.
- 281+62.5+62.5 N+P2O5+K2O/ha **(Ratoon crop)**

Spacing

- 90 cm Row to row for autumn season
- 75 cm for spring season
- 60 cm for summer season (after wheat harvesting)

Seed rate

- 35 q/acre or 7 , two budded setts /running metre

Irrigations

First irrigation at 30-40 Days after planting. 8-10 days interval during pre- monsoon period and 15-20 days during post monsoon period

Planting method

Opening of furrows in dry condition followed by application of fertilizers in furrows then placing of sugarcane setts in dry furrows, covering of setts with dry soil upto 1 inch with spade and irrigating the furrows upto the half of the ridge and followed by planking after 3-4 days for better germination.

CoH 167

Fertilizers

- Recommended dose of fertilizers i.e 150+50+50 N+P2O5+K2O/ha
- (**Plant crop)** Apply full dose of P and K and 1/3rd N at the time of planting in furrows and remaining N in two equal splits in May and June.
- 225+50+50 N+P2O5+K2O/ha **(Ratoon crop)**

Spacing

- 90 cm Row to row for autumn season
- 75 cm for spring season
- 60 cm for summer season (After wheat harvesting)

Seed rate

- 35 q/acre or 7, two budded setts /running metre

Irrigations
First irrigation at 30-40 Days after planting. 8-10 days interval during pre- monsoon period and 15-20 days during post monsoon period

Planting method
Opening of furrows in dry condition followed by application of fertilizers in furrows then placing of sugarcane setts in dry furrows, covering of setts with dry soil upto 1 inch with spade and irrigating the furrows upto the half of the ridge and followed by planking after 3-4 days for better germination.

PACKAGE OF PRACTICES BY VSI PUNE

Package of Practices of recently released varieties

Variety - VSI 434

Released status
Released 2012

Percentage
Somaclone of CoC 671

Planting season
Preseasonal (15th Oct – 15th Dec) and Seasonal (15th Dec to 15th Feb)

Climate requirement
Arid to semiarid climate with medium rainfall

Brief information
High sugared, good for early crushing to increase sugar recovery, extra early vigor, drought tolerant, more cane population, good ratooner, medium thick cane, greenish yellow to light pruple canes, slightly tight leaf sheath and profuse spines on the leaf sheath, moderately resistant to smut.

Soil requirement
Medium black with good drainage

Planting method
Row distance 3.5 to 4 feet wider row or 2.5 – 5 feet paired row for drip irrigation. 6 cm two eye bud set spacing.

Seed requirement
25000 two eye bud set spacing.

Seed treatment
0.01% Carbendazin + 0.03% Melathion followed by Acetobactor dizotrophicus 1 lt in 100 lt water.

Fertilizer management
25 tonnes FYM/Hac, Preseasonal – 340:170:170 kg NPK/Hac. Seasonal/Ratoon 250:115:115 kg NPK/hac. Micronutrients as per soil status.

Intercultivation
Weed free crop up to 4 month with 2-3 hand weeding or spraying of weedicide, Atrazine @5kg/hac Pre emergence or Metribuzine @ 1kg/hac in 1000 lt water. Small earthing up at 45 DAP. Final earthing up – at 120 DAP.

Irrigation management
Preseasonal 300 – 325 ha.cm, seasonal 250 -275 ha.cm, Ratoon crop – 225 – 250 ha.cm, as per the climate & soil type (12 to 18 days interval).

Ratooning ability
Good ratooner

Ratoon management
Harvesting at ground level, trash mulching, stubble shaving, spraying of 0.01% carbendazim on stubbles, Gap filing if necessary with one eye bud seedlings fertilizer application with crow bar technique in two splits i.e 15 DARI and immediate irrigation & 120 DARI. Application of micronutrients as per the soil status.

Plant protection disease and insect pest reaction
MR to Smut, GSD, Pokkah boeing & red rot. Less susceptible to IB, Scale insect, ealy bug, MR ESB.

Harvesting
10 to 11 month after planting

Cane yield
128 ton/hac

CCS % (12 month)
16.1% to 17.3%

Variety Co VSI 03102

Released status
Pre released 2012

Percentage
80 R 41 GC

Planting season
Pre seasonal (15th Oct – 15th Dec) and seasonal (15th dec to 15th Feb)

Climatic requirement
Suitable for medium to high rainfall zone

Brief information
High yielding and high sugared genotype, erect type, thick cane, greenish yellow to purple cane, green leaf sheath, dark green and medium broad leaves, suitable for drip irrigation, mechanical planting and harvesting, sparse flowering, moderately resistant to smut.

Soil requirement
Medium black with good drainage.

Planting method
Row distance 4 – 4.5 feet for furrow irrigation, 4.5 – 5 feet wider row or 3 – 6 feet paired row for drip irrigation. 6 cm two eye bud set spacing.

Seed treatment
25000 two eye bus setts/hac

Seed treatment
0.01% Carbendazin + 0.03% Melathion followed by Acetobactor dizotrophicus 1 lt in 100 lt water.

Fertilizer management
25 tonnes FYM/Hac, Preseasonal – 340:170:170 kg NPK/Hac. Seasonal/Ratoon 250:115:115 kg NPK/hac. Micronutrients as per soil status.

Intercultivation
Weed free crop up to 4 month with 2-3 hand weeding or spraying of weedicide, Atrazine @5kg/hac Pre emergence or Metribuzine @ 1kg/hac in 1000 lt water. Small earthing up at 45 DAP. Final earthing up – at 120 DAP.

Irrigation management –
Preseasonal 300 – 325 ha.cm, seasonal 250 -275 ha.cm, Ratoon crop – 225 – 250 ha.cm, as per the climate & soil type (12 to 18 days interval)

Ratooning ability –
Good ratooner

Ratoon management – Harvesting at ground level, trash mulching, stubble shaving, spraying of 0.01% carbendazim on stubbles, Gap filing if necessary with one eye bud seedlings fertilizer application with crow bar technique in two splits i.e 15 DARI and immediate irrigation & 120 DARI. Application of micronutrients as per the soil status.

Plant protection disease and insect pest reaction
Resistant to smut,MR to GSD, rust & red rot (Nodal method) MR to ESB, LS to IB, MB, Scale insect.

Harvesting
14 to 15 months after planting

Cane yield
157 ton/hac

CCS %
15.55

PACKAGE OF PRACTICES BY GBPUA&T

Co Pant 03220

1. **Selection of field/land preparation**

   Deep ploughing, sandy loam to clay loam
2. **Suitability of the variety for the area** – Uttrakhand

3. **Seed treatment (recommended chemical with dosage)**

Name of disease	Fungicide	Doses per hac	
		a.i(g)	Formulation %
Whip smut/Smut	Triadimephon	25 WP	0.1%
	Carbendazim	50 WP	0.1%
	Propiconazole	25 EC	0.1%
	Hexaconazole	5 EC	0.2%
Red rot	Carbendazim	50 WP	0.1%
	Benomyl	50 WP	0.1%
	Thiophenate Methyl	70 WP	0.25%

4. **Sowing time**
   Autumn planting – October
   Spring planting – 15 Feb to 15 Mar
   Summer planting – After wheat

5. **Seed rate/ Sowing method**
   Line sowing with row to row and plant to plant disease
   Autumn 40 -50 q/hac (90 cm)
   Spring 45 – 55 q/hac (75 cm)
   Summer 55 – 60 q/hac (60 cm) Furrow flat method

6. **Fertilizer dosage & time of fertilizer application**
   NPK - 120:60:40
   Y2M + full post K20 – Basal Y2M up to 90 days

7. **Weed control**
   Atrazin, Sinagin = @ 2kg/hac PE
   Leudi Uttalin @1kg/hac PE

Three full 30, 60, 90 day

8. Major Disease and pest control

Name of disease	Fungicide	Doses per hac	
		a.i(g)	Formulation %
Wilt	Carbendazim	50 WP	0.1%
Rust	Mancozeb	75 WP	0.25%
	Copper Oxychloride	50 WP	0.25%
	Chlorothenil	75 WP	0.2%
Eye Spot	Mancozeb	75 WP	0.25%
	Copper oxychloride	50 WP	0.2%
Leaf Scald	Streptocyclin + Tetrecycline		0.01%
	Plantomycin		0.05%
	Copper Oxychloride	50 WP	0.25%
Sugarcane Top Borer : Scripophaga novella	Chlorantraniliprole 0.4 G	75	18750
	Chlorantraniliprole 18.5 SC	75	375
	Carbofuran 3CG	1000	333000
	Phorate 10CG	3000	30000
Early shoot borer : Chilo Infuscatellus	Chlorantraniliprole 20 SC	75	375
	Chlorantraniliprole 0.4G	75	18750
	Fipronil 0.3 GR	75 – 100	25000- 333000
	Fipronil 5 SC	75 – 100	1500 – 2000
	Monocrotophos 36 SL	600 – 800	1500 – 2250
	Chloropyrifos 20 EC	250 – 300	1250 – 1500
	Quinalphos 25 EC	500	2000
Sugarcane stalk borer : Chillo auricillus	Monocrotophos 36 SL	750	1875
	Chloropyrifos 20 EC	250 – 300	1250 – 1300
Sugarcane Root borer: Emmalocera depressela	Fipronil 0.3 GR	75 – 100	25000 – 333000
	Fipronil 5 EC	75 – 100	1500 – 2000
Pyrilla = Sugarcane Leaf hopper : Pyrilla Perpusilla	Monocrotophos 36 SL	200	500
	Quinalphos 25 EC	300	1200
	Chloropyriphos 20 EC	300	1500
	Dichlorvous 76 SC	300	376
	Carbaryl 50 WP	750	1500
Sugarcane Black Bug: Cavelerius excavates	Chloropyrifos 20 EC	150	750
	Quinalphos 25 EC	500	2000
White Grub	Phorate 10 CG	2500	25000
Termite : Microtermes obesi and odontotermes obesus	Imidacloprid 70 WS (Seed treatment/100kgSeed)	70 – 105	100 – 150
	Imidacloprid 17.8 SL	70	350
	Chlorantranilprole 18.5 SC	100 – 125	500 – 625
	Bifenthin 10 EC	100	1000

	Fipronil 0.3 GR	75	25000
Sugarcane Mealy bug: Saccharicoccus Sacchari	Monocrotophos 36 SL	600	1500

9. **Irrigation Schedule** (Critical stage for irrigation and method of irrigation)
   3 – 4 irrigation before monsoon
   1 – 2 irrigation after monsoon
   Critical stage – germination till ring phase

10. **Harvetsing** (Approximate days of harvesting maturity) 300 days

11. **Quality characteristics of variety, If any (Prominent characteristics of variety)**
    Sucrose % = 16.5 – 18.5

12. **Expected yield (per acre**) = 320 to 380 qtl/acre (yield subject to use under area of adaption and the recommended climate condition and adoption of package of practices.

Co Pant – 99214

1. **Selection of field/land preparation**

   Deep ploughing, sandy loam to clay loam
2. **Suitability of the variety for the area** – Uttrakhand & Uttar Pradesh

3. **Seed treatment (recommended chemical with dosage)**

Name of disease	**Fungicide**	**Doses per hac**	
		a.i(g)	**Formulation %**
Whip smut/Smut	Triadimephon	25 WP	0.1%
	Carbendazim	50 WP	0.1%
	Propiconazole	25 EC	0.1%
	Hexaconazole	5 EC	0.2%
Red rot	Carbendazim	50 WP	0.1%
	Benomyl	50 WP	0.1%
	Thiophenate Methyl	70 WP	0.25%

4. **Sowing time**
   Autumn planting – October
   Spring planting – 15 Feb to 15 Mar
   Summer planting – After wheat

5. **Seed rate/ Sowing method**
   Line sowing with row to row and plant to plant disease

Autumn 40 -50 q/hac (90 cm)
Spring 45 – 55 q/hac (75 cm)
Summer 55 – 60 q/hac (60 cm) Furrow flat method

6. **Fertilizer dosage & time of fertilizer application**
   NPK - 120:60:40
   Y2M + full post K20 – Basal Y2M up to 90 days

7. **Weed control**
   Atrazin, Sinagin = @ 2kg/hac PE
   Leudi Uttalin @1kg/hac PE
   Three full 30, 60, 90 days

8. **Major Disease and pest control**

Name of disease	**Fungicide**	**Doses per hac**	
		a.i(g)	**Formulation %**
Wilt	Carbendazim	50 WP	0.1%
Rust	Mancozeb	75 WP	0.25%
	Copper Oxychloride	50 WP	0.25%
	Chlorothenil	75 WP	0.2%
Eye Spot	Mancozeb	75 WP	0.25%
	Copper oxychloride	50 WP	0.2%
Leaf Scald	Streptocyclin + Tetrecycline		0.01%
	Plantomycin		0.05%
	Copper Oxychloride	50 WP	0.25%
Sugarcane Top Borer : Scripophaga novella	Chlorantraniliprole 0.4 G	75	18750
	Chlorantraniliprole 18.5 SC	75	375
	Carbofuran 3CG	1000	333000
	Phorate 10CG	3000	30000
Early shoot borer : Chilo Infuscatellus	Chlorantraniliprole 20 SC	75	375
	Chlorantraniliprole 0.4G	75	18750
	Fipronil 0.3 GR	75 – 100	25000- 333000
	Fipronil 5 SC	75 – 100	1500 – 2000
	Monocrotophos 36 SL	600 – 800	1500 – 2250
	Chloropyrifos 20 EC	250 – 300	1250 – 1500
	Quinalphos 25 EC	500	2000
Sugarcane stalk borer : Chillo auricillus	Monocrotophos 36 SL	750	1875
	Chloropyrifos 20 EC	250 – 300	1250 – 1300
Sugarcane Root borer: Emmalocera depressela	Fipronil 0.3 GR	75 – 100	25000 – 333000
	Fipronil 5 EC	75 – 100	1500 – 2000
Pyrilla = Sugarcane Leaf hopper : Pyrilla Perpusilla	Monocrotophos 36 SL	200	500
	Quinalphos 25 EC	300	1200
	Chloropyriphos 20 EC	300	1500
	Dichlorvous 76 SC	300	376
	Carbaryl 50 WP	750	1500
Sugarcane Black Bug: Cavelerius excavates	Chloropyrifos 20 EC	150	750
	Quinalphos 25 EC	500	2000

White Grub	Phorate 10 CG	2500	25000
Termite : Microtermes obesi and odontotermes obesus	Imidacloprid 70 WS (Seed treatment/100kgSeed)	70 – 105	100 – 150
	Imidacloprid 17.8 SL	70	350
	Chlorantranilprole 18.5 SC	100 – 125	500 – 625
	Bifenthin 10 EC	100	1000
	Fipronil 0.3 GR	75	25000
Sugarcane Mealy bug: Saccharicoccus Sacchari	Monocrotophos 36 SL	600	1500

9. **Irrigation Schedule** (Critical stage for irrigation and method of irrigation)
   3 – 4 irrigation before monsoon
   1 – 2 irrigation after monsoon
   Critical stage – germination till ring phase

10. **Harvesting** (Approximate days of harvesting maturity) 360 days

11. **Quality characteristics of variety,** If any (Prominent characteristics of variety)
    Sucrose % = 17.0 – 19.0

12. **Expected yield (per acre)** = 320 to 340 qtl/acre (yield subject to use under area of adaption and the recommended climate condition and adoption of package of practices.