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SUGARCANE

RABI / OCTOBER-DECEMBER

TYPES OF VARIETIES

CHEMICAL FERTILIZER

PEST CONTROL

GENERAL INFORMATION

Sugarcane, *Saccharum officinarum* L. is a perennial grass. It belongs to bamboo family and it is indigenous to India. It is the main source of sugar, jaggery and khandsari. About two-thirds of the total sugarcane produced in India is consumed for making jaggery and khandsari and only one third of it goes to sugar factories. It also provides raw material for manufacturing alcohol.

Brazil is largest producer of sugarcane followed by India, China, Thailand, Pakistan and Mexico. In India, Maharashtra is largest producer of sugar and it contributes about 34% of

CLIMATE



Temperature

20-30°C



Rainfall

75-150cm



Sowing Temperature

20-25°C



Harvesting Temperature

20-30°C

SOIL

Well drained, deep, loamy soil with ground water table below 1.5-2 m from the soil surface with adequate water holding capacity is ideal for sugarcane cultivation. It can tolerate considerable degree of acidity and alkalinity so it can be grown on soil, ranging from 5 to 8.5. If soil is low in pH (less than 5) add lime in soil and for high pH (more than 9.5) do gypsum application.

POPULAR VARIETIES WITH THEIR YIELD

Coj 85: It is early season variety. It is tolerant to red rot and frost. It is prone to lodging hence do proper earthing up and propping. Gives average yield of 306quintal/acre.

Co 118: Early season variety. The canes of this variety are medium thick, greenish yellow color. It is tolerant to red rot and frost. It performs well under high fertility condition with frequent irrigation. Gives average yield of 320 qtl/acre.



CoJ 64: It is early season variety. It gives good germination, profuse tillering and good ratooner. It produces good quality of jaggery. It is highly susceptible to red rot. Gives average yield of 300 qtl/acre.

CoH 119: Mid-season variety. It has tall thick greenish canes with prominent weather. It is tolerant to red rot and frost. It is an average ratooner. Gives average yield of 340Qtl/acre.

Co 238: Mid-season variety. It has tall thick greenish canes with prominent weather. It is tolerant to red rot and top borer. It is an average ratooner. Gives average yield of 365Qtl/acre.

CoJ 88: Mid season variety. Canes are tall with medium thickness and are of greyish color. Its juice contains 17-18% of sucrose. Ratoons yield is also excellent. It is non lodging and it is tolerant to red rot. Produces jaggery of good quality. Also suitable for saline irrigation water. Gives average yield of 337 qtl/acre.

CoS 8436: It is mid-season variety. It is short red variety with thick sturdy greenish yellow canes. It is non lodging and tolerant to red rot. Gives excellent yield under high fertility soils with frequent irrigations. Gives average yield of 307 qtl/acre.

CoJ 89: It is suitable for late planting. It is resistive to red rot, easy to detrash and non-lodging. It gives average yield is 326 qtl/acre.

Co 1148: Applicable for late sowing. Good germinator with profuse tillering, excellent ratooning capacity. It produces medium quality jaggery. It is highly susceptible to red rot. It gives average yield of 375 qtl/acre.

CoH 110: It is late maturing variety.

Co 7717: Early maturing, high sugar content variety. It gives moderately resistant to red rot. Also having good juice content and maintaining this property for long period.

CoH 128: Early maturing variety of sugarcane.

CoPb 93: The variety is red rot disease and frost tolerant. This variety contains 16-17% of sucrose in November and 18% of sucrose content in December. It gives an average cane yield of 335 qtl/acre. It gives good quality of jaggery.

CoPb 94: This variety contains 16% of sucrose in November and 19% of sucrose content in December. It gives an average cane yield of 400qtl/acre.

Other States varieties:

Cos 91230: Gives average yield of 300 qtl/acre.  (/en/pn/home)

Co Pant 90223: Gives average yield of 350 qtl/acre.

CoH 92201: Early maturing variety, gives average yield of 300 qtl/acre.

Cos 95255: Early maturing variety, gives average yield of 295 qtl/acre.

CoS 94270: Gives average yield of 345 qtl/acre. [Show Less](#)

LAND PREPARATION

Give two ploughings to land. First ploughing should be given at depth of 20-25 cm. Crush clods with suitable implements or machine.

SOWING

Time of sowing

In Punjab, planting season of sugarcane is from September to October and February to March. Sugarcane takes generally one year to mature therefore called as Eksali.

Spacing

Row spacing is ranges from 60-120 cm for sub-tropical regions.

Sowing Depth

Sow the sugarcane at depth of 3-4 cm and cover it with soil.

Method of sowing

A) For sowing use improved method of planting like deep furrow, trench method, paired row method or ring pit method.

1) Dry planting in ridges and furrow: With the help of tractor drawn ridger, make ridges and furrows at distance of 90 cm. Plant sugarcane setts then cover it with soil. After then give light irrigation.

2) Paired row planting: Make Trenches at 150 cm distance using trenches opener. Plant sugarcane in paired row using 30:30-90-30:30cm spacing. It gives higher yield as compared to ridges and furrow.

3) Ring Pit method: Circular pits of 60 cm diameters are dug at depth of 30 cm with a tractor mounted digger. 60 cm gap is provided between adjacent pits. 2-3 ratoons can be taken. 25-50% higher yield can be obtained compared to ridge and furrow.

B) Single budded set planting: Select healthy setts for plantation. Make furrows at distance of 75-90 cm. Place single budded setts. If only small size setts from top portion of cane are selected then they are planted at distance of 6"-9". Place eye of sett on upward direction to ensure proper and quick germination. Cover setts with soil and apply + Show Less

SEED

Seed Rate

Various research and experiment shows that, germination percentage of 3 bud sets is higher than the setts having more or less than three buds. Germination percentage of single bud sett is very low because of moisture loss from other cut end. Also if whole cane stalk is planted without giving any cut, still germination percentage remain low as only top end will get germinate.

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FERTILIZER

Fertilizer Requirement (kg/acre)

UREA	SSP	MURIATE OF POTASH	ZINC
200	As per soil test	As per soil test	#

Nutrient Requirement (kg/acre)

NITROGEN	PHOSPHORUS	POTASH
90	As per soil test	As per soil test

Soil testing after every three year is necessary to know actual need of fertilizer. Before sowing at time of last ploughing, add well decomposed cow dung@8ton or Vermicompost+ Ralligold@8-10kg or PSB@5-10kg per Acre.

At time of sowing apply Urea@66kg per acre. At development stage, apply second dose of Urea@66kg at the time of second irrigation. Apply third dose of Urea@66kg at time of fourth irrigation.

In winter due to low temperature uptake of nutrient by crop become less and plant give yellow appearance. To recovered crop take spray of 19:19:19@100gm/15Ltr of water. In water scarcity situation spray of Urea+Potash@2.5kg/100Ltr is helpful for crop.

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WEED CONTROL



In sugarcane due to weed infestation about 12 to 72% yield loss is observed depending upon severity. Initial 60-120 days are critical for weed management. Therefore weed management practices should be adopted within 3-4 months after planting. For control of weeds, chemical is not only solution. Adopting mechanical as well as cultural practices gives effective solution.

1) Mechanical Measure: As sugarcane is widely spaced crop, weeding with hand or interculture operation can be easily carried out. Take 3-4 hoeing after every irrigation.

2) Cultural Operations: It includes change in cropping pattern, intercropping and trash mulching. Monocropping leads to heavy infestation of weed. Crop rotation with fodder or green manure crops suppress weeds. Also sugarcane is wider spaced crop so there is opportunity for weed to grow in large numbers. If sugarcane is intercropped with short duration crops then it will suppress the weed growth also give additional benefit. In trash mulching, mulch of 10-12cm thickness is provided in between cane row after emergence of cane. It will restrict the sunlight thus help to check weed growth. It also conserves soil moisture.

3) Chemical: To control weeds, carry out pre-emergence weedicide application with Simazine or Atrazine@600-800 g/acre or Metribuzine@ 800 g/acre or Diuron@1- 1.2 kg/acre. Apply pre-emergence herbicides immediately after planting. Apply 2,4-D@250-300 g/acre as post-emergence herbicide for broad-spectrum weed control in sugarcane.

IRRIGATION

The number of irrigations required will depend upon soil type, water availability etc. The hot weather associated with dry winds and drought increases the water requirement of the crop.

Apply first irrigation when 20-25% crops have germinated. In monsoon, apply irrigation depending upon rainfall intensity and frequency. In case of scanty rainfall apply irrigation with 10 days interval. Afterwards increase irrigation intervals, i.e. apply water with 20-25 days interval. To conserve moisture in soil do mulching in between cane rows. Avoid water stress from April to June. Water stress during these days will reduce yield. Avoid water logging in standing field. Tillering stage and elongation or grand growth phase are critical for irrigation.

Earthing: Soil between the furrows of canes, is taken with the help of spade and applied to the sides of the plants. It helps to mix top dressed fertilizer well within the soil, also it helps to

PLANT PROTECTION

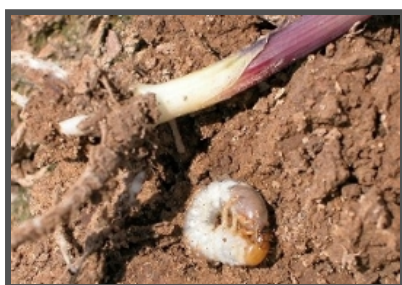
- Pest and their control:**



Shoot borer: Attacked in germination stage upto (en/pn/home) in modes formations. Larva make holes in shoot below the ground level and then enter into it thus causes dead heart. It give offensive smell. It is mostly observed in light soil and in dry weather. Pest is active from March - June.

Avoid late plantation. Apply Chlorpyrifos@1litres/acre with 100-150 litres of water over the setts placed on furrows with the help of roscan. Remove dead heart infected plants. Give light irrigation and avoid drying of field.

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White Grub: These feed on root system and thus damage to crop. Entire drying up of stalks and easily dislodging of cane are main symptoms for white grub infestation. In initial stage infestation observed in patches and afterwards it spread on entire field.

The adult beetles emerge from the soil during June-July with the first showers of rain. They congregate on the nearby trees and feed on their leaves during night. The eggs are laid in the soil and the larvae (grubs) hatching from them eat away the rootlets or root hairs of the groundnut plants. To destroy beetles spray Imidacloprid@4-6ml/10Ltr of water on plants of nearby sugarcane plants.

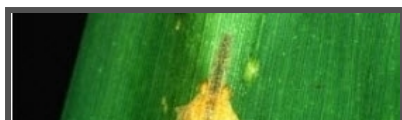
For effective management of white grub. Plough the field and exposes the beetles resting in the soil. Do not delay crop sowing. Before sowing treat cane with Chlorpyrifos. Apply Phorate@4kg or carbofuran@13kg per acre in the soil at or before sowing. In heavily infested fields, flooding is to be done for 48 hrs. Do drenching of Clothianidin@40gm/acre with 400 Ltr

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Termites: Before sowing do cane treatment. Dip setts in imidacloprid solution@4ml/10Ltr for 2min or at time planting spray Chlorpyrifos@2litre/acre on setts. If infestation occur in standing crop, drench with Imidacloprid@60ml/150litre of water or Chlorpyrifos@1ltr/200Ltr of water.

Pyrilla: Severe pest of North India. Adult suck leaf sap under the surface of leaves. It results in yellowing white spot and withering. They secretes honey like substance and attract sooty mould fungi, due to this leaves become blackish.



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At regular interval, collect and destroy white-puffy egg masses.

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Root borer: Borer enter into root zone of shoot below ground. Infestation is high from July onward. Due to infestation yellowing of leaves from leaf apex to downwards along the margin is seen.

Before sowing do cane treatment with Chlorpyrifos. In dry field infestation is low so keep field dry and clean, avoid water logging condition in field. Carry out earthing operation at 90days. If infestation is observed in field, do drenching with Chlorpyrifos 20EC@1Ltr/acre with 100-150Ltr of water near the root zone or do granular application of Quinalphos@300ml/acre. Remove infected cane and destroyed it away from field.

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Stalk Borer: It is active from July onwards with onset of monsoon. Larvae feeds on inner surface of leaf sheath, mid rib and stalk. It can attack any region of stalk. Infestation continues from cane formation to harvest.

Avoid excess use of nitrogen, keep field clean and provide proper drainage. Provide earthing up to prevent crop from lodging. Chemical control is rarely effective. Release parasitoid, *Cotesia flavipes*@800 mated females/acre at weekly interval from July to November.

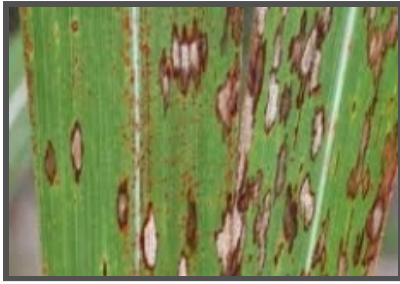
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Top Borer: It attacks crops from tillering to maturity phase. Larvae makes tunnels into midribs causes white streak which later turns brown. If infestation occurs during tillering phase, the attacked shoots dies resulting in dead heart formation. If it attacks on grown up canes, apical growth is arrested resulting in bunchy top symptoms.

To control do drenching of Rynaxypyr 20SC@60ml/acre in 100-150Ltr of water in between period of month end of April to first week of May. Maintain proper drainage in soil, as water logging increases top borer incidence.

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Red Rot: From top, third and fourth leaves show yellowing and drying. At later stage show discoloured lesion on rind. If split the diseased stalk show reddening of internal tissue. A sour and alcoholic smell emanates from the infected cane.

To control grow disease resistance varieties. Select disease free cane for sowing. Discard cane which show reddening at cut end and at the nodal region. Do crop rotation with paddy or with green manure crops. Avoid water logging field. If infestation is observed remove the crop and destroyed it away from field. Disinfect soil around the diseased clump with Carbendazim@0.1% solution.

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Wilt: Root borer, nematodes, termite, drought and water logging condition cause plant to wilt infection. Crown leaves turn yellow and loose turgor and withers. Boat shape cavities appears in pith region and crop get shrink. It reduces germination and reduces yield.

Use disease free setts for planting. Do setts treatments with Carbendazim@0.2% + Boric acid@0.2% for 10min. Intercropping with onion, garlic and coriander will reduces the wilt disease.

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Pokkah Boeng: It is air borne disease. Symptoms are observed in monsoon. Disease plant bear distorted and wrinkled leaves. Leaves show reddish patches at base of leaf blade. Newly formed leaves become shortened and sword like.

Grow pokkah boeng disease resistive varieties. If infection of disease is observed spray with Carbendazim@4gm/Ltr or Copper Oxychloride@3gm/Ltr or Mancozeb@3gm/Ltr of water.

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HARVESTING

Harvesting of cane at right time is necessary for good yield and for high sugar recovery. Harvesting at over aged or under aged cane leads to loss in cane yield. Depending upon withering of leaves and cane juice, harvesting time can be decided. To know the right harvesting time some farmer used hand sugar refractometer is used. Sickles are used for

harvesting. Stalks are cut at ground level so that the bottom sugar rich internodes are harvested which add to yield and sugar. De-topping at appropriate height. After harvesting quick disposal of the harvested cane to factory is necessary.

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POST-HARVEST

Sugarcane provides a juice, which is used for making white sugar, and jaggery (gur) and many by products like bagasse and molasses.

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