





Sugarcane Cultivation with Harvel Azud Drip Irrigation System

Essential Inter-culture Practices

- 1. Earthing up:** After 3-4 months of planting, earthing up is to be done to prevent lodging of the crop. It helps in improved root proliferation and better aeration.
- 2. Detrashing:** This operation involves removing bottom and old leaves and using the same for wrapping and propping of the cane. This helps in preventing the incidence of diseases and pest attack and keeps entire field weed free.

Harvesting: Harvesting in sugarcane is practiced in collaboration with the industry, in most of the cases, to suit the factory timings. Sucrose content in the plants will reach the desirable level on the 10th month of one year crop duration, and they will be ready for harvest within the next two months.

Pest and disease management: Following are some of the major pests and diseases and their control measures:

Name of Pathogen/ Disease	Symptoms	Control measures
Early Shoot borer (Chilo infuscatellus) 	Dead heart in 1-3 months old crop. Rotten portion of straw emits a foul odour.	Trash mulching and light earthing up at 35th day. Release of 50 fertilized Sturmiopsis parasite/acre when the crop is at the age of 45-60 days.
Internode borer (Chilo sacchariphagus indicus) 	Internodes constricted and shortened with a number of boreholes and frass in the nodal region.	Distribution of cards pasted with eggs of Trichogramma chilonis @ 10 cards/acre, at 20 meters distance when the crop is 4-11 months old. Pheromone traps (@ 10/acre at 20 meters distance) in the 5 months old crop.
Top borer (Scripophaga excerptalis) 	Parallel rows of shot holes in new leaves. Red tunnels in the midribs of the leaves.	Release of parasite, Isotima javensis Rohn against 3rd or 4th broods of the pest.
Red rot (Colletotrichum falcatum) 	Yellowing and drying of leaves from margins to midrib. Reddish discoloured patches on the internal tissue.	Selection of resistant varieties and disease free bud chips. Destruction of affected clumps.

NOTE: Apart from thickwall driplines which are widely used, thinwall "AZUDLINE" (AZUDTAPE) is also a good option for surface/ subsurface irrigation in sugarcane. It is having many advantages like savings in installation cost, easy in handling & storage and best suited for the small & marginal farmers who do not have the resources as well as time to avail subsidy.



Advantages

- Improvement in Sugar Recovery
- More millable canes produced
- Higher tillering at early stage
- Improvement in quality produce
- Excellent Germination
- Water Saving
- Manpower Saving
- Energy Saving
- Fertilizer Saving
- Uniform distribution of fertilizers and nutrients
- No Soil erosion
- Lesser chances of disease incidence
- Good aeration and controlled soil temperature

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Crop introduction: Sugarcane (*Saccharum officinarum*) belongs to the grass family (Poaceae). It is an important cash crop cultivated in about 84 countries of the world. Brazil is the largest producer of Sugarcane in the world. India is the 2nd largest producer after Brazil. Brazil tops the world in both production and area while it is second (80 tons/hectare) after Argentina (84 tons/hectare) in yield. India's average yield is quite low at 69 tons/hectare.

Total area under Sugarcane cultivation in India is 5 million hectare with maximum area in U.P. followed by Maharashtra. On the other hand, productivity is the highest in Tamil Nadu (104 tons/ha) and lowest in U.P. (58 tons/hectare) (Source: Sugarcane Research Institute, Coimbatore). The world demand for sugar is the primary driver of sugarcane agriculture.

Climate: Sugarcane is a tropical crop but can also be grown well in subtropical climate. It requires warm and humid climate for growth while, cool sunny and dry climate for ripening. The crop does not tolerate severe frost. Germination does not take place when temperature goes below 7°C.

It has wider adaptability and grows well where temperature ranges between 20°C to 40°C. Therefore in India, sugarcane is grown right from Punjab and Haryana in the North to Karnataka/ Tamil Nadu in down South. It responds well to long period of sunlight (12 to 14 hours), high humidity (above 70%) and high rainfall even upto 1500 mm. If assured irrigation water is available, it can also be grown in areas where rainfall is low up to 500 mm.

Soil: Sugarcane prefers black to medium black soils upto 90 to 160 cm deep with good drainage. Sandy loam soils along the river sides are also good for this crop. As the crop remains in the field for 12 to 18 months, hence good fertility should be maintained. Water logged soils with poor drainage are not suitable. The ideal pH range is 5.0 to 8.5 with optimum of 6.5. It is a heavy feeder crop, so, should not be grown in light soils.

Field Preparation: Plough the land 2-3 times. First ploughing should be 20-30 cm deep. After applying F.Y.M next ploughing should be carried out. Then clods should be crushed by suitable implement or machine (Rotavator). Make ridges and furrows as per the drip layout.

Nutrient management: Sugarcane is a very heavy feeder and hence it requires high doses of fertilizers compared to other perennial crops. Total quantities of N, P & K for sugarcane grown in three seasons are given below

S.No.	Planting season	Nitrogen kg/ha	Phosphorus kg/ha	Potash kg/ha
1.	Adsali (Planting: July-August)	400	175	175
2.	Pre-season (October-November)	350	175	175
3.	Suru (January)	250	150	150

These quantities are given in split doses and at critical growth stages as per the given schedule.

- These recommendations are indicative only however it can be changed as per the soil, climate and season.

For detailed fertigation chart contact HARVEL AZUD team.

Selection of seed and varieties: Per hectare yield and percent sugar recovery are the two crucial factors which are taken into consideration while selecting varieties of Sugarcane.

There are different varieties for three seasons. However, some varieties which have wider adaptability are grown in two or even in all the three seasons.

- Adsali – Co-740, Co-M-88121 (Krishna), Co-86032
- Pre-season – Co-740, Co-7219 (Sanjeevani), Co-8014, Co-M-7114, Co-M-88121 (Krishna), Co-C-671
- Suru - Co-740, Co-7219, Co-M-7125 (Sampada), Co-7527, Co-M-88121 (Krishna), Co-8014 (Mahalaxmi), Co-86032 (Nirja).



Sowing time/Seasons: There are three seasons of sugarcane planting :-

- 1. Adsali** – Planted in the months of June/July. (duration 15 to 18 months)
- 2. Pre-season** – Planted in October – November. (duration 12 to 14 months)
- 3. Suru** – Planted in January. (duration 12 to 14 months)

Staggering of sugarcane planting in three seasons ensures continuous cane supply to the sugar factories, whose crushing season is 150 to 190 days from October or November onwards.

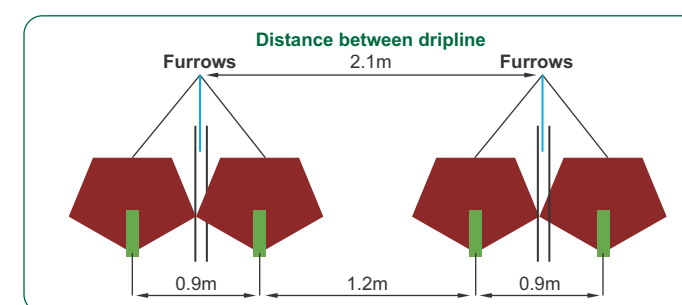
Sowing/ Planting methods

1. Paired Row Technique

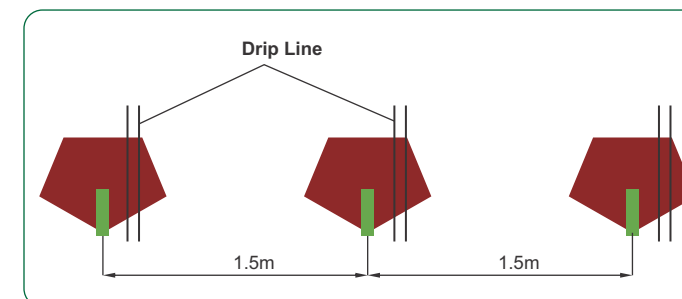
Fine Textured Soil: (0.9m + 1.5m) X 0.11m;

Medium Textured Soil: (0.9m + 1.2m) X 0.11m

Coarse Textured Soil: (0.75m + 1.05m) X 0.11m

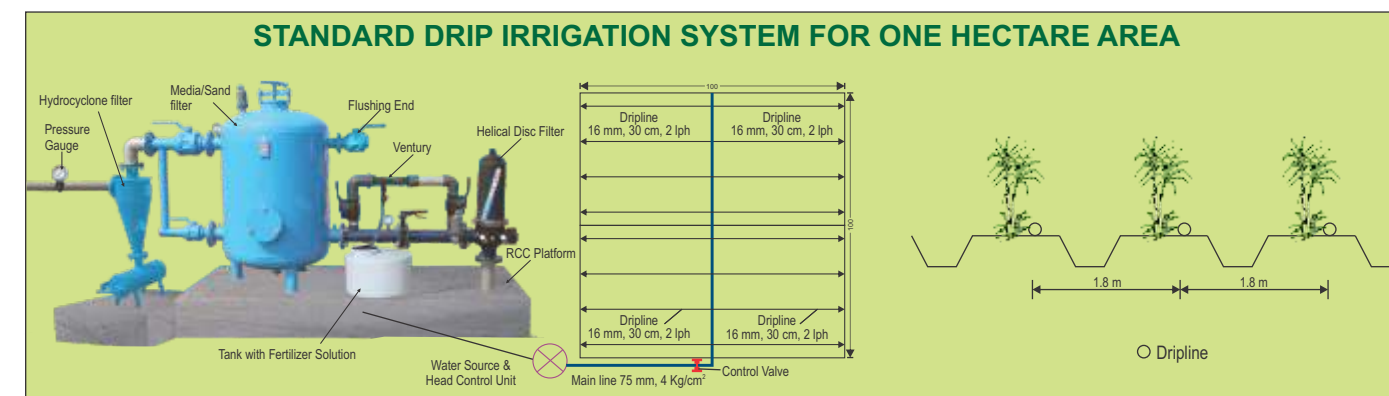


2. Single Row Technique: Row distance - 1.5 to 1.8 m



- 25,000 sets of three eyebuds per hectare when ridges are 1.2m apart.
- 30,000 sets of three eyebuds per hectare if ridges are 1 m. apart.

Seed sets should be treated with fungicide (Bavistin) before planting.



Two methods of planting of sets:

- 1. Dry method** (This method is followed in heavy soil when irrigation is undertaken after planting).
- 2. Wet method** (This method is followed in light to medium soil, where irrigation is given to the field before planting).

Growth stages

- 1. Germination-** 15 -30 days after transplanting
- 2. Tillering-** 50 -120 days
- 3. Grand growth phase-** 121 - 210 days
- 4. Maturity-** 210 – 365 days

Water management: Water requirement of sugarcane is very high. The total quantity of water to be given is different for the crop of different seasons. Irrigation management is correlated with the growth stages and duration of the sugarcane.

Season	Water requirement (mm)
Adsali	3500
Pre-season	2500
Suru	2250

For detailed irrigation schedule contact HARVEL AZUD team.

In Sugarcane, intercrops like Cowpea, Chickpea, Potato, Green Gram, Onion, Garlic, Groundnut, and many other crops can be tried, as there is a wide spacing between rows. Depending on the location specific factors, different intercrops may be tried.

Advantages of using Intercrops

- Intercrops control weeds up to 60% in the initial stage and provide extra income to farmers.
- They act as a live mulch and preserve moisture and reduce the pest attack by being alternate hosts in some cases. Green manures raised as intercrops improve the soil fertility on incorporation.

Common intercrops used in various regions are as follows

- 1. Sugarcane + Groundnut:** Maharashtra
- 2. Sugarcane + Onion/ Garlic:** Maharashtra & Eastern UP
- 3. Sugarcane + Onion:** Tamilnadu & A.P.
- 4. Sugarcane + Greengram:** Tamilnadu, Karnataka & A.P.
- 5. Sugarcane + Blackgram:** Karnataka & A.P.