

Raising of Sugarcane Nursery through Tray Culture and Polythene Bag

Komal Verma¹, Anshika Manral¹ and Nitendra Singh¹

¹*The School of Agriculture, Galgotias University Greater Noida, GautamBuddh Nagar - 201310

Uttar Pradesh, India

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Abstract

The study is concentrated on Raising of sugarcane nursery. As we know India is an agricultural country and sugarcane is one of the most primary profit making crops (Kharif crop). Sugarcane (*Saccharum officinarum*) belongs to family Grasses. Brazil has been largest sugarcane producer but in 2018-2019 it come 2nd largest producer after India. In India, Uttar Pradesh is the top notch state regarding sugarcane production having area 22.77 lakh ha along yielding of 135.64 million ton cane. There are 2 most common varieties i.e., *Saccharum officinarum* and *Saccharum barberi* having good sugar content, thicker stem and poor sugar content, thinner stem respectively.

Keywords- commercial crop, kharif crop, variety

Introduction

Sugarcane is primal matter for white sugar and sugar is most important ingredient of kitchen especially in India. So nursery is good option for successful production of sugarcane. Elegant area for raising sugarcane Nursery: Monitoring of soil physical properties like moisture, aeration, alkalinity etc., Sufficient spraying of water, Excess distribution of seed plot should be avoided, Transportation should be easy, the planter should be operative. If it is Primary nurseries than it should be placed near factory farm/research institution farm/Government organization.

In India, Uttar Pradesh is the top notch state regarding sugarcane production having area 22.77 lakh ha along yielding of 135.64 million ton cane i.e. 50% of cane produced alone in the country by this state. Followed by Uttar Pradesh sugarcane producing state are Maharashtra (82,984 tons), Karnataka (31,135 tons), Tamil Nadu (17,153 tons), Bihar (13,824 tons), Gujarat (12,072 tons), Haryana (9,632 tons), Punjab (8,023 tons), Andhra Pradesh

(7,789 tons), Uttarakhand (6,271 tons). In India's agro industry after textile, sugarcane industry is the second largest industry.

In world, Brazil is the top notch state regarding sugarcane production having area 10.226 acre ha along yielding of 75.167kg/ha sugarcane. Followed by Brazil sugarcane producing countries are India (348.448 tons), China (123.059tons), Thailand (87.468 tons), Pakistan (65.450 tons), Mexico (56.446 tons), Colombia(36.951 tons), Australia (34.403 tons), Guatemala (33.533 tons), USA (29.926 tons), Indonesia (27.158 tons).

Diversity of Uttar Pradesh

Flora of Uttar Pradesh

Tropical Moist Deciduous Forests are the utmost common forest of Uttar Pradesh. the most common plants are silver fir, spruce, hododendrons, betula, deodar, gigantic haldu, dhak, chir, oak, sal, teak, mahua, sisso, chironjisalai, and tendu. Also medicinal herbs like Podophyllum, hexandrum, RauwolfiaSarpagandha, Vialaserpens and aephecragerardiana.

Fauna of Uttar Pradesh

The animals found are Nilgai or Dharrose , Wild pig , Jackal , Fox , Hare , Black buk, tiger, leopard, wild bear, sloth bear, elephant, gond, para, chinkara, sand grouse, musk deer, brown bear, chital, sambhar, jackal, porcupine, jungle cat, hare, squirrel, monitor, lizard and Wolf .

Birds of Uttar Pradesh

The utmost common birds which found are crow, pigeon, dove, jungle fowl, black partridge, house sparrow, peafowl, blue jay, parakeet, kite, myna, quail, bulbul, snipe, comb duck, grey duck, whistling teal, kingfisher and woodpecker.

Reptiles of Uttar Pradesh

The utmost reptiles found are Lizard, Bamania, , Krait, Cobra, Pit-viper, Crocodile, Goh, Dhaman and Tortoise.

Fishes of Uttar Pradesh

The utmost common are Parthan, Vittal ,Mahaser, Saul, Mirgal, Cuchia, Labi, Einghi, Hilsa, Trout, Tengan, Rohu, Rasela, Mangur, Kata, Mirror Carp and Eel.

Local name of sugarcane

English - Cultivated Sugarcane, Noble Sugarcane, Sugar Cane, Noble Cane.

Hindi – Ikh, Sakhara, Ganna.

Tamil: karumbu.

Scientific classification of sugarcane

Kingdom: Plantae

Division : Magnoliophyta

Class: Liliopsida

Order: Poales

Family: Poaceae

Genus: *Saccharum*

Botanic Depictio N

a. Root

- Sugarcane root is fibrous root system
- Sugarcane has 2 type of root sett root and shoot root
- Sett root are temporary root which come forth in a period of 24 hrs.
- Shoot root are permanent root which come forth in a period of 5-6 days later planting.
- Sugarcane roots are broad, husky and fewer branches.

b. Stem

- Stem of sugarcane is cylindrical, node and internode present.
- Lateral bud, growth ring and root primordia present at node part.
- Upper part of stem consists of less amount of sucrose so this part is not required to sugar industry.
- Sugarcane is produced asexually i.e. vegetative propagated by stem cutting.

c. Leaf

- Alternate arrangement of leaf present in sugarcane.
- The leave are present at node
- Leaf has two part blade and sheath parted by leaf joint.
- The leaf blades are in tubular shape.
- The leaf sheaths are in linear shape.
- In leaf scar type extension are seen called auricles.

d. Inflorescence

- Inflorescence of sugarcane is arrow type.
- Arrow is silky appearance with 20-30 cm long.
- The spikelet is in racemose arrangement.
- Each Inflorescence content number of seed which have reproduction capacity.

Climatic requirement

a. Latitude and altitude

- Sugarcane successfully grown from altitude 36.7° N and 31.0° S and altitude of 1000m from sea level.

b. Rainfall

For cultivation of sugarcane 1100 and 1500mm rainfall required. As sugarcane is vegetative propagated plant so it also cultivated with low rainfall up to 500mm. In rainfall below 500mm plant get wilted have to suffer from water stress and rainfall above 1500 lead to water logging.

c. Temperature

- Sugarcane can grown in wide temp. Range from 38⁰C.
- Required temp for germination is 27⁰ c -30⁰ c.
- Temp less than 27⁰ c is injruis to health and aboe 38⁰c affect the sprouting stage.
- Optimum temp –

Carbon Metabolism	30°c
Sugar fusion	30°c
Sugar carrier	30-35°c
Tillering	33.3-34.4°c
Root Rise	36°
Shoot Rise	33°c

d. Sunshine

- Sugarcane is day plant
- More solar radiation lead to higher yield
- Approx. 7-8hrs sunshine required for healthy growth of sugarcane

e. Frost

- As sugarcane is dayPlant chill weather affect the sprouting
- Even in chill temp meristem tissue gets damaged.

f. Wind

- Relative wind velocity is 30-40km/hr
- Wind velocity more than 60m/hr cane lodging and breakage

g. Planting Season

i) Subtropical region

- Sept to Oct (autumn)
- Feb to march (spring)
- Tropical season

ii) June to August (Adsali)

- January to February (Eksali).
- October to November (Eksali).

Major Disease in Sugarcane Nursery

Bacterial diseases

a. Red stripe

- Causal agent - *Xanthomonas rubrilineans*.

Symptoms

- Red and brown strip on the leaf
- Necrosis and rotting of leaf occur
- Spindle leaf get damaged

b. Gummy disease

- Causal agent - *Xanthomonas axonopodis* pv. *vasculorum*.

Symptoms

- Red brownish streak on leaf
- Chlorosis occur in apical meristem

- Plant growth get stunned
- Vascular bundle get reddened

Fungal diseases

a. Red rot

- Causal agent - *Colletotrichum falcatum*

Symptoms

- Drying of spindle leaf
- Stalk get colorless and hollow
- Black fruiting bodies develop on node
- Sour smell emerges from stalk
- Reddening on internal tissue

b. Eyespot

- Causal agent - *Bipolaris sacchari*.

Symptoms

- Spot occur on leaves and stalk
- Spot run parallel to vein
- Reddish and yellow hole occur on leaves
- Yellow brownish streak get extended to leave

Viral diseases

a. Mosaic disease

- Causal agent - *Sugarcane mosaic virus*

Symptoms

- Molting occur on laminar part of plant
- Plant leaves discoloured
- Plant growth get stunned

b. Yellow leaf

- Causal agent - *Sugarcane yellow leaf virus*

Symptoms

- Plant growth stunned
- Leaf get discolored
- On the lower side of leaf yellowing of the mid rib occur

Nematodes disease

a. Lesion

- Causal agent - *Pratylenchus* spp

Symptoms

- Root get affected
- Moisture and nutrient content decrease in plant
- Stalk growth stunned

b. Root-knot

- Causal agent - *Meloidogyne* spp.
- **Symptoms**
- Poor plant growth
- Yellowing of foliage
- Wilt appearance in plant
- Uptake of water capacity get reduced

Phytoplasma diseases

a. Grassy Shoot

- Causal agent - *Sugarcane grassy shoot disease*

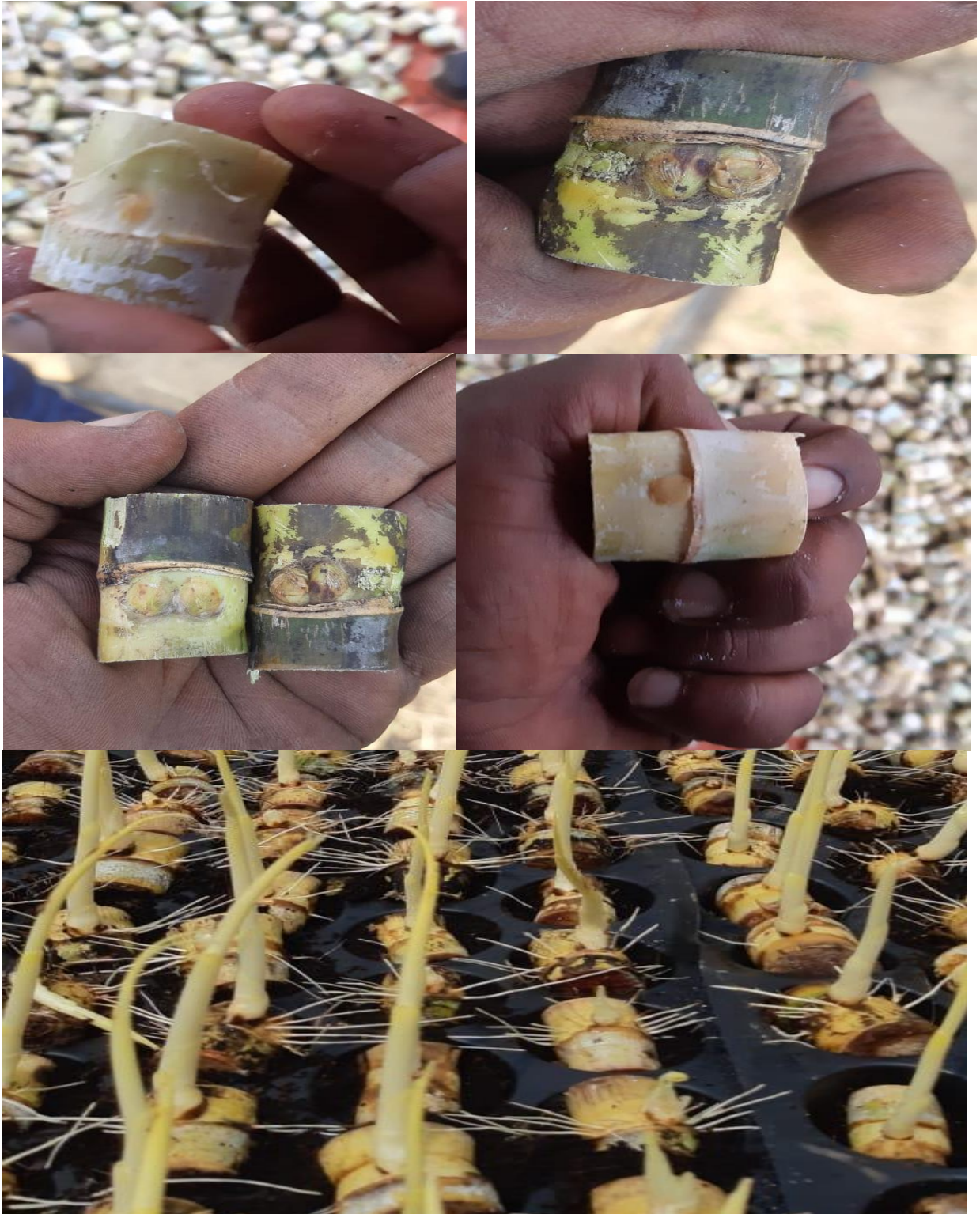
Symptoms

- Yellowing and whiteing of leaf
- Internode growth get stunned
- Size of leaf reduced
- Shoot get proliferated
- Apical meristem get affected

Study Area

a. Budchoice

- ❖ Prefer vigorous canes of 7 to 9 months old with 10-12 buds per cane.
- ❖ Bud should be removed using bud chipper tool.
- ❖ The chipped buds have to be used along organic or chemical solutions.
- ❖ 450-500 canes per acre are desired.



b. Settregrimen

- ❖ **Sett medication with Azospirillum:** Make its slurry along 10 packets (2000 g/ha) with adequate water and immerse the setts in the slurry for 15 minutes before planting.
- ❖ **Sett medication with fungicide:** soak set in Carbendazim (1 gram per liter)
- ❖ **Aerated steam medication:** make setts Aerated steam at 50 o C for 1 hour to manage initial disease of grassy shoot disease i.e. mainly related to near shoot part.

c. SOIL MIXTURE FOR POLYBAG

- ❖ As tray culture uses coco pit instead of soil, soil is not an important factor in tray culture.
- ❖ Soil should be used from the area of transplanting site.
- ❖ Soil mixture should contain field soil, manure (compost), and sand in equal amount.
- ❖ Mixture should be mixed simultaneously there should be no lumps.
- ❖ After mixing of mixture it should be treated with pesticide, herbicide, insecticide or bio control measures can also be used.
- ❖ Soil treatment reduces the chance of soil born disease.

d. SITE PREPARATION

- ❖ Tray culture area can be done either open or in room but in a proper confined room it will be more suitable and there will be less chance of nursery failure.
- ❖ Room should have sunlight source or artificial light arrangements.
- ❖ Room should have complete ventilation, germ free surface (sanitized room/surface) and water facility.
- ❖ Humidity of room should also be maintained as coco pit moisture depends upon room humidity too.
- ❖ In Polybag culture, it can be done both open area or in room.
- ❖ The polythene bag should be sanitized before use.
- ❖ Soil mixture should be made in proper care.
- ❖ Soil moisture, aeration level should be checked before seeding process.

Methodology

a. Nurserypreparation in Tray

- ❖ Stuff half of the tray with well decomposed coco pit.
- ❖ Set the buds horizontal or in a lightly tilt pointin the cones of a tray.
- ❖ Now enclose the tray fully by coco pit.
- ❖ Room should have proper sunlight, aeration, temp or artificial condition also be done.
- ❖ If favorable temperature (warm) maintained white root will come within 3 – 5 days and shoot willshow in next 2-3 days.
- ❖ As per the moisturerequirement of coco-pith, spraying to the trays in the evenings for the next 15 days, water logging should be avoided.At six leaf stage grading of the plants has to be initiated



b. Polybagnursery

- ❖ Polythene bags are being used of 10x15cm filled with soil along compost mixture (in 1:1) ratio with an open space, close to water source.
- ❖ Bags partially filled with soil to the node level.
- ❖ Buds are put at 1-2 cm depth in bags.
- ❖ Spraying of water in these bags twice a week.
- ❖ Nursery will be wise up fortransplanting in next 60days

**Result and Discussion**

Why nursery is important?

It helps in prevent from soil born disease, seed born disease and pest. Like smut, sett rot, red rot, wilt and grassy shoot disease etc. All these disease are because of fungus and cause serious damage to crop due which affect the production very badly and farmers suffer huge loss due to it. As from bud selection should be done carefully, during bud selection bud should be present on root primordial region of sugarcane. If bud was damaged or absent nursery will not grow successfully and directly lead to loss to the farmer. Assugarcane is cultivated by sowing the seeds setts straight into the field but growing its nursery is also cheaper farmer can look into this instead of direct planting of sets in field with proper management. So that farmer can have good sugarcane yield.

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