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Course name :

**Crop Production Technology-II
(ASAG 2204)**

Course credit :

(2-1-0)

Lecture 13

Topic: Sugarcane



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1.17 Planting Material:

1.17.1) Sett :

Propagated by **vegetative methods** by planting the stem of immature cane, known as setts. Buds on sett germinate to give plants. **Top setts** are taken from a crop ready for harvest For planting, setts should be free from pests and disease

1.17.2) Rayungans :

Setts with shoots produced by cutting of the tops of standing Canes.



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1.17.3 Seblang :

Tiller separation is also an ideal method. Clump with its sett intact is transplanted. Survival is better and growth quicker. If labor is not scarce this method is appropriate.

1.17.4 Space transplanting [STP] :

Nursery beds of 10x5 m ,30 days old seedling for transplanting .600-800 single bud setts are planted in bed @ 2 tons /ha seed material is sufficient against 6-7 tons/ha .

Single budded setts from top half of cane is planted vertically.

Normal watering & other management aspects are followed



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- Less seed rate
- Uniform crop stand
- Reduction in late shoot production
- Low pest and disease attack
- 25 % increase in yield.

1.17.5 Tissue culture technique :

This technology is mostly used in reviving degenerated varieties.

Meristem tips are grown in artificial laboratory conditions Multiplication is faster.

Used to develop seed material from limited number of buds



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1.18 PLANTING METHODS :

1.18.1 Planting in flat beds

It is very popular method in **Northern India and in parts of Maharashtra**. Shallow furrows of **8-10 cm deep** are made. Distance between two rows should be kept **75-90 cm**. Generally 3 budded setts are used to plant in the end to end planting system. The furrow is covered by 5-7 cm of soil and field is leveled by planking.

1.18.2 Ridge and Furrow Method:

The method is adopted in areas with moderate rainfall but have drainage problem.

Deep furrows are opened in 'v' shape, **10-15 cm** deep in N. India, **20 cm** in S.I. It is also practiced in Eastern UP, & in Peninsular India particular in heavy soils.



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1.18.3 Trench Method or Java method

In some **coastal areas** as well as in other areas where the crop **grows very tall** and the strong winds during rainy season cause **lodging of cane**, trench method is adopted to save the crop from lodging.

Trenches at a distance of 75-90 centimeters are dug with the help of ridger or by manual labour.

Trenches should be about **20-25 centimeters deep**.

The setts are planted end to end in trenches.



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1.18.4 Rayungan method

It is Indonesian term meaning a developed cane shoot with single sprouted bud.

A portion of field is selected for Rayungan production is left at harvesting time.

The top of the cane is cut off which results auxiliary buds begin to sprout.

For quick and effective sprouting, fertilizer especially nitrogen in heavy dose is applied and field is irrigated.

After 3-4 weeks sprouted buds are separated in single bud setts & transplanted on ridges.

It is costly hence is not commonly adopted in India however is usually used for filling gap.



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1.18.5 Distant Planting Method

It was developed at Indian Institute of Sugarcane Research (IISR) Lucknow.

Single budded setts are planted in nursery @ 20 q/ha or 18000 setts/ha.

After 45-60 days single budded setts are planted in main field at **90cm×50cm**.

1.18.6 Pit Planting

Method is very popular in **Assam** and also in **Kerala hilly tracts**.

Pits are made at interspacing of **20-30cm in rows** along the contours with **row to row spacing of 75 cm**.

Organic manure is placed at bottom of pits.

Cane setts are placed in the triangle in pits and covered with soil. System can be used in rain fed agriculture.



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1.18.7 Skip Furrow Planting

It is common in Orissa.

It is hybrid of flat and trench method.

Trenches are dug 45 cm apart & gap of 90 cm is left after each two rows.

1.18.8 Sabling or Sprouting Method:

Plants are sown in fertile soil with wide spacing, shallow planting, frequent irrigations and adequate fertilization.

Tillers soon after they develop their own roots are separated from the mother plant and planted separately. It is very successful in Java and Cuba.

1.18.9 Bud transplanting

Sugarcane buds with half of its stalk can be planted in small polythene bags filled with organic manure and soil

After sprouting they can be transplanted in the main field.



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1.19 MANURES & FERTILIZERS

Recommended rate of N P K fertilizers for AP

- a) Srikakulam, Vizianagaram, Visakhapatnam, Medak : **112+100+100 kg/ha**
 - b) Nellore, W. godavari, Krishna, Guntur : **168+100+120 kg/ha**
 - c) Kurnool, Cuddapah, Anantapur, Chittoor : **224+100+120 kg/ha**
 - d) Nizamabad : **250+100+120 kg/ha**
- N :P:K = 120-150: 80:60 NI and 250-350:100:80 SI**

1.19.1 Nitrogen

Deficiency of Nitrogen: shows paleness of foliage, early leaf senescence thinner and shorter stalks longer but thinner roots.

Excess Nitrogen, prolongs vegetative growth, delays maturity and ripening, lowers juice quality, susceptible to lodging and pests and diseases incidence.



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1.19.2 Phosphorus

“P” requirement is less than N and K.

Required for adequate tillering.

Interacts with N and thus enhance ripening.

P deficiency leads to reduced tillering, delays in canopy development, Affects stalk elongation, Less production of secondary and tillering stalks and leaf color appear violet green.

1.19.3 Potassium

Essential for carbon assimilation, photosynthesis translocation of carbohydrates.

Involved in various enzymatic activities.

Important for sugar synthesis, maintains cell turgidity, moist stress.

Develop resistance to pests and diseases and lodging.
Balances the effect of N & P.



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1.20 Time & Method of application.

- Nitrogen requirement is maximum at tillering, early grand growth period from 1-6 months.
- Late application of N beyond 120 days, reduces the juice quality and formation of water shoots.
- Application should be given at 30 , 60 and 90 DAP.
- Phosphorous applied basally in furrow bottom.
- Potassium application normally done along with N application because of better utilization of N, in the presence of K , therefore K is applied at 45, 90 DAS.
- Late application of K, at 6 months under drought situations improve sugar recovery
- Nitrogen and potassium fertilizers are given in split doses applied in bands on either side of row
- Foliar Nutrition of urea @ 1- 2.5% & potassium @ 2.5% under moisture stress is useful to improve yield and quality