

Role of qualitative seed cane production and varietal balance: Also future needs for sugar mills and sugarcane growers in Uttar Pradesh

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ABSTRACT

Balanced varietal planning with an adequate proportion of high sugared and high yielding sugarcane crop in each factory area is required so that sugarcane with maximum sucrose content is supplied throughout the crushing period to realize optimum recovery. Since, ratoon occupies more than 50 percent area; emphasis should be laid on raising ratoon productivity by adopting proper management practices. This needs to be taken up on a priority basis because the future hopes are pinned mainly on sugarcane ratoon. Strict follow up of pre harvest maturity survey, harvesting schedule and supply management in proper sequence is needed. Scientific regulation of cane supply to factories with minimum time lag between harvesting and milling, drawl of cane from economic distance and strict regulation on the physical quantity of the cane should be followed. Cane crushing during hot summer months should be avoided. If milling is to be continued under specific circumstances, suitable varieties, agro and chemical technology, quick and efficient supply of canes should be followed. The author's experience has shown that seed cane production in sugarcane is a profitable entrepreneurship. Progressive farmers and unemployed youth can make use of the growing demand for disease free planting materials and capitalize on it. There would not be any problem in disposing-off the seed cane, if the new and improved sugarcane varieties are chosen for seed production. Role of quality planting materials have helped quick spread of improved varieties in the subtropical states.

Key words: Qualitative seed cane production, Varietal balance, Seed cane, Three tier programme.

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INTRODUCTION

In U.P., sugarcane is subjected to biotic stresses such as red rot, smut, wilt, grassy shoot, ratoon stunting and leaf scaled diseases. Of these, red rot causes colossal losses leaving no millable cane. The other diseases adversely affect the productivity and also the sucrose content. Root borer, top borer, stalk borer, pyrilla and scale insects are some of the pests which damage the crop. Abiotic stresses such as drought, winter logging, salinity and alkalinity and temperature variation such as very hot in summer and low in water are the major constraints in sugarcane seed cane production. Adequate and balanced use of input is essential to obtain the desired output from the crop. Since, sugarcane is grown under highly diverse situations, poor socio – economic conditions of a large number of farmers result in low application of fertilizers, plant protection chemicals and other crucial input like lacking of quality seed cane.

Bulkiness, non storability, post harvest deterioration and restricted users are the limitations in sugarcane marketing, which is different from that of other agricultural produce. Purchase of sugarcane by mills is channelled through co – operative societies which are supposed to safe guard the interest of farmers. In this process, for want of proper co – ordination, unusual delay occurs in cane crushing, leading to drying of cane and inversion of sucrose and the resultant heavy loss of sugar during processing.

QUALITY SEED CANE PRODUCTION

(a) **Heat treatment of seed cane:** There are four different methods of heat therapy have advocated for sugarcane, i.e., hot air treatment (HAT), aerated steam treatment (AST), hot water treatment (HWT) and moist hot air treatment (MHAT). Two routinely adopted by cane growers as well as factory person to remove seed borne diseases are HWT and MHAT. U.P. Council of Sugarcane Research, Shahjahanpur, (U.P.) also well adopted HWT for seed cane treatment before planting the breeder seed plot each and every year. HWT of seed cane before planting at 50°C for two hours effectively eliminated the infection of G.S.D., R.S.D., smut diseases. Germination and yield were also improved by using HWT. Somehow, in MHAT was found at 54°C for 4 hours in air tight sugarcane seed. Temperature was very close to sugarcane setts and buds. Hence damaged to both sugarcane set and buds. Hence, comparatively HWT is more beneficial for a heat treatment of seed cane to reduce seed borne diseases and also enhance the germination percentage. Long hot water treatment (at 52°C for two hours) is preferred over short hot water treatment of buds as well as disease control under the former [3].

(b) **Planting time:** In subtropical India, favorable temperature for tillering prevails from January to June. In initial stages tillers parasitise on mother shoot for their growth. The tiller mortality ranges from 25 to 62 percent in plant crop under different planting seasons. Temperature plays key role in the germination of cane. Temperature range of 20 to 32°C is considered to be optimal for good germination while below 10°C and higher than 40°C suppresses bud sprouting. Autumn planting (October) provides maximum time for tillering. Plant population is managed through reduction in row spacing from 90 cm to 75 cm.

(c) **Planting technique:** The manipulation in planting techniques for different conditions are subjected to germination, shoot density and reduced tillers mortality. In subtropical flat planting technique is most common in which by fast depletion of soil and sett moisture, germination of buds is usually poor. New days, trench method of planting with single bud settling planting giving better results in plant population as well as higher number of tiller formation in subtropical regions.

(d) **Crop geometry and seedcane rate:** The tillering in sugarcane is affected by spacing. There is a positive interaction between row spacing and soil fertility with result that under low level of soil fertility, closer spacing is better. Sugarcane planting in 90 – 30 – 90 cm (Paired row) system proved significantly superior to 150 – 30 – 150 cm. spaced transplanting technique (STP) consists of raising single bud settling (nursery) in 50 m² area for one hectare transplanting with low availability of breeder seed cane. Increased seed rate maintain higher tiller per hectare.

(e) **Integrated nutrients management:-** Increase in tiller population and higher vigour is achieved through balanced fertilizer schedule coinciding with first order, second order and third order of tillering from April to June. Higher use of nitrogenous fertilizers is recommended to enhance the earlier formed tillers under late planting in subtropical regions.

(f) **Inter-culture operations:** In sugarcane, late tillering results in low percentage of surviving tillers on one hand and cause unnecessary competition due to over crowding on the others. Tillering needs semi earthing up during initial tillering phase at 135 DAP. Tying of the crop (binding) should be done when it attains a height of 2 meters. Trash – twist propping (binding) is advocated as the best way of doing this where the crop is with heavy top. These binding, earthing up operations keep the seed cane erect avoiding losses such as sprouting of buds damages by rats, jackals etc. after lodging.

(g) **Trash mulching:** One distinct advantage of aligning trash in the row is the conservation of soil moisture, which is reflected in an increase in stalk number, stalk density, vigorous of the cane stalk and better germination of buds.

(h) **Water management:** In sugarcane among four stages i.e., germination (One to two months), formative (3 -4 months), grand growth phase (5 to 8 months), and maturing or sucrose synthesis phase (9 to 12 months) the formative (tillering) stage is most critical for moisture demand.

FACTORS AFFECTING QUALITY OF SEED CANE

1. **Age of crop:** In general, sugarcane planting material is derived from 10 -12 months old crop at harvesting age. If the setts are to be taken from mature crop, the top one third portion or top two third portion should be used for seed purpose. Immature cane (8 – 10 months) portion has all favourable factors for germination and a good crop. The cane top portion generally contains healthy buds, more moisture, nutrients and more reducing sugars [6, 4].

2. **Growing condition:** Growing condition under which a seed crop raised influence the quality of seed to a great extent. Cutting from well irrigated and manured crop of 6 – 8 months age have reported to be better in germination [2]. Clements [1] recommended a hardening treatment for seed crop at the age of six months by imposing a drought for about a month to activate the buds and to reduce damage to buds.

3. **Disease and pests:** One of the major objectives of sugarcane seed production has been the control of certain diseases transmitted through seed cane. The details about these have been given earlier in this text.

THREE TIER SEED CANE NURSERY PROGRAMME

Production and availability of good quality healthy seed cane of high sugared and high yielding varieties in cultivation and newly released varieties are of immense value from the point of sustaining varietal performance and management of diseases and pests. This procedure involves three stages of seed cane production viz., breeder, foundation and commercial seed cane nursery.[5]

The three tier nursery programme is a must for every sugar factory to maintain a constant flow of good quality material of newly released varieties. Factories must obtain nucleus or breeder seed from research stations periodically to produce foundation then certified seed cane. At least foundation seed nursery should be inspected and certified at proper stages of crop growth.

CONCLUSION

Balanced varietal planning with an adequate quantity of seed cane in each factory area is required. Scientific regulation of seed cane supply to factories and strict regulation on the physical quality of the seed cane should be followed.

REFERENCES

1. Clements, H.F., (1980). Sugarcane crop logging and crop control. Principles and practices. The university press., Hawaii.
2. Gahlot, N.S., (1956). Studies on germination and tillering in sugarcane. Ind. Sug. VI (8): 562 -571.
3. Mishra, S.R., (2003). Recent advances in seed production of sugarcane. Coop. Sug. 34 (10): 805-808.
4. Nagarjan, R., (2000). Seed nursery programme in sugarcane 32nd meeting of sugarcane research and development workers of Tamil Nadu. Pp. 174 – 176.
5. Singh K, (1977). Sugarcane diseases and three tier seed programme. Sugar News, 9:81-9
6. Sundara, B., (1998). Sugarcane cultivation. Vikas. Publishing house. Pvt. Ltd.