



## Strategies for healthy seed cane production and fast spread of newly released varieties in U.P.

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### Abstract

Sugarcane being a vegetatively propagated crop, tends to accumulate disease and pests during the course of cultivation. Therefore, production and supply of quality planting materials assumes greater importance. The use of healthy and vigorous seed plays a vital role in the cane development programme. Seed borne disease are responsible for considerable crop losses, this problem is a serious concern with vegetatively propagated crops like sugarcane, in which there may be either a progressive decline in production along with sugar recovery with increasing trends of diseases. Heat therapy among various agro – techniques has provided an effective method for the management of seed borne diseases like smut, grassy shoot, ratoon stunting, mosaic etc. The goal of heat therapy is killing of the pathogen at a specific temperature that is lethal. Integration of the seed production chain (nucleus, breeder, foundation and certified seeds) is of utmost importance in the case of sugarcane crop. Proper planning and monitoring. There is urgent need to revise the seed programme both quantitatively and qualitatively. Duplication should be avoided. There should be a drive to popularize new varieties and crash programmes for their production, and distribution should be developed on priority so that fast replacement of old varieties by newer one may possible.

In U.P., sugarcane is subjected to biotic stresses such as red rot, smut, wilt, grassy shoot, ratoon stunting and leaf scalded 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.

### Strategies :

**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 (Mishra, 2003). **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 per cent 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.

**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.

**Crop geometry and seed 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 m<sup>2</sup> area for one hectare transplanting with low availability of breeder seed cane. Increased seed rate maintain higher tiller per hectare.

**Adequate nutrition/ 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.

**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.

**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.

**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 determining quality of seed :**

**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 (Sundara, 1998, Nagarjan, 2000).

**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 ingemination (Gahlot, 1956). Clements (1980) 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.

**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.

**Major interventions and researches :** To raise healthy and quality seed cane it is essential to identify the thrust areas and concentrate efforts in that direction. These are given below.

- Adoption of suitable varieties.
- Healthy seed cane supply.
- Crop diversification
- Integrated nutrient management
- Water management
- Integrated pest and disease management
- Integrated weeds management
- Sound seed nursery programme.



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