



Information Sheet

11. GENERAL

11.5 Flowering and pithing in sugarcane

Flowering

Flowering in sugarcane can affect crop yield and quality. Several varieties will flower if the ideal weather conditions occur in February (SADC countries closer to the equator e.g. Malawi and Zambia) and March (South Africa).

Flowering acts as a natural ripener because it prevents stalk growth and can improve cane quality in the short-term. Research has shown that flowering increases the yield of sucrose if the cane is harvested well before September and may reduce sucrose yield if harvested later than this.

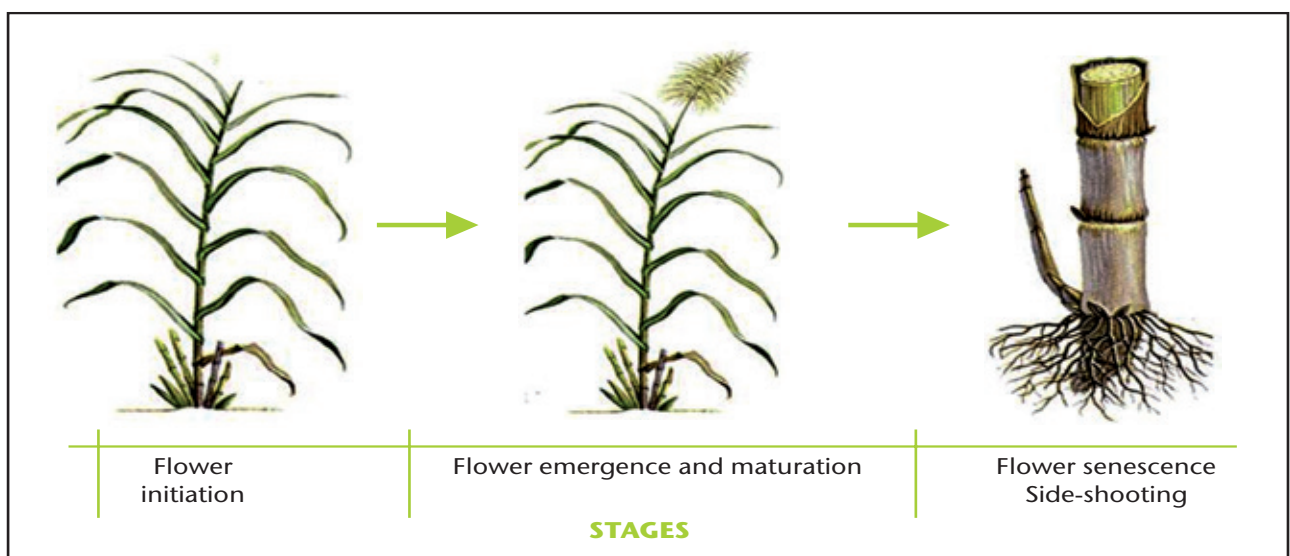
In sugarcane, there are three flowering stages (see the diagram below). Flower initiation is the period in which the sugarcane plant is actively growing, has mature internodes and when weather and daylength conditions are ideal for flower induction. The flower initiation period is typically 3 weeks long during February or March in the southern hemisphere. Approximately 8 - 12 weeks after flower initiation, growth is terminated at the apical meristem of the plant and flowers will begin to emerge. Flowers continue to mature over the next 12 weeks and when flower senescence begins, side-shooting will also occur. Harvesting of profusely flowered cane should be performed before side-shoots occur.

Pithing

Pithiness (or pithing) is a condition that occurs in sugarcane stalks that causes dry cavities with no sugarcane juice. Pithiness is of an economic concern because it can result in reduced sucrose extraction during milling. There is little information on pithiness in sugarcane, although it has been shown to be well correlated with flowering.

If flowering in sugarcane occurs, this ensures a very high chance that pithing will occur (because pithing is caused by flowering), and therefore managing flowering cane may also manage pithing.

A research project at SASRI showed that flowering and pithing were not correlated with yield loss in Malawi and Zambia (consistently high flowering each season) because the farms had a well-controlled harvesting programme. The cane was harvested before yield losses could occur and there was strict management of flowered cane.



Factors affecting flowering (and pithing)

Daylength	<ul style="list-style-type: none"> • The initiation of flowering occurs when daylength is approx 12.5 hrs or less. • South African flower initiation period: last 3 weeks of March.
Temperature	<ul style="list-style-type: none"> • Favourable temperatures during the initiation period of flowering are approx 28°C during the day and greater than 20°C at night. • Temperatures during the initiation period that are higher than 32°C during the day and less than 18°C at night, prevent flowering. • High minimum temperatures appear to be more important during floral initiation.
Management Factors	<ul style="list-style-type: none"> • Soil moisture: unstressed cane with sufficient rainfall or irrigation is prone to more profuse flowering. • Nutrient status: research suggests that sufficient to excess nitrogen in the soil during floral initiation is likely to make flowering more profuse.

Flowering Propensity in different varieties

Some varieties flower more profusely than others because the propensity of a variety to flower is genetically determined. The propensity to flower in sugarcane varieties is shown in the table. Planting shy-flowering varieties in the fields to be harvested from September to the end of the season is recommended in South Africa. In SADC countries closer to the equator (e.g. Malawi and Zambia), most varieties will flower every year because the climatic conditions are favourable every year to induce flowering. Varieties N14 and N23 are particularly high flowering every year and should not be planted if harvesting is to be scheduled after August/September.

RARE	LOW	MEDIUM	HIGH
N24	N16	N12	N11
N37	N19	N13	N14
N41	N21	N30	N17
N46	N22	N31	N18
N47	N25	N32	N20
N48	N26	N36	N23
N49	N28	N39	N27
N50	N33	N40	N29
	N35	NCo376	N42
	N43		N52
	N44		

Tips for managing flowered cane

Harvesting guidelines

- Flowered fields will generate higher sucrose yields in June, July and August than non-flowered fields.
- Cane should be harvested before Sept/Oct if the number of flowered stalks is more than 20% per field.
- If flowering is less than 20% then it can be carried over to the next season, but stalk yield will be lower than non-flowered cane.
- If the cane has an eldana infestation, do not carry over the cane. Harvesting of those fields is a priority.
- Be careful not to overestimate the stalk yield of flowered cane.

Chemical guidelines

- Ethephon (Ethrel) is not registered to be sprayed on cane with a high propensity for flowering in South Africa because flowering is too erratic across seasons under local conditions.
- Profuse flowering crops (more than 20%) will not respond favourably to chemical ripeners.

A new flowering index has been developed for predicting sugarcane flowering. This information assists growers and minimises the negative impacts of flowering by allowing them to adjust harvesting schedules in advance if heavy flowering is predicted.

Information from this index is included in a flowering report, which is available for individual weather stations, from the SASRI WeatherWeb. The WeatherWeb can be accessed by visiting www.sugar.org.za/sasri and selecting WeatherWeb from the menu.

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