

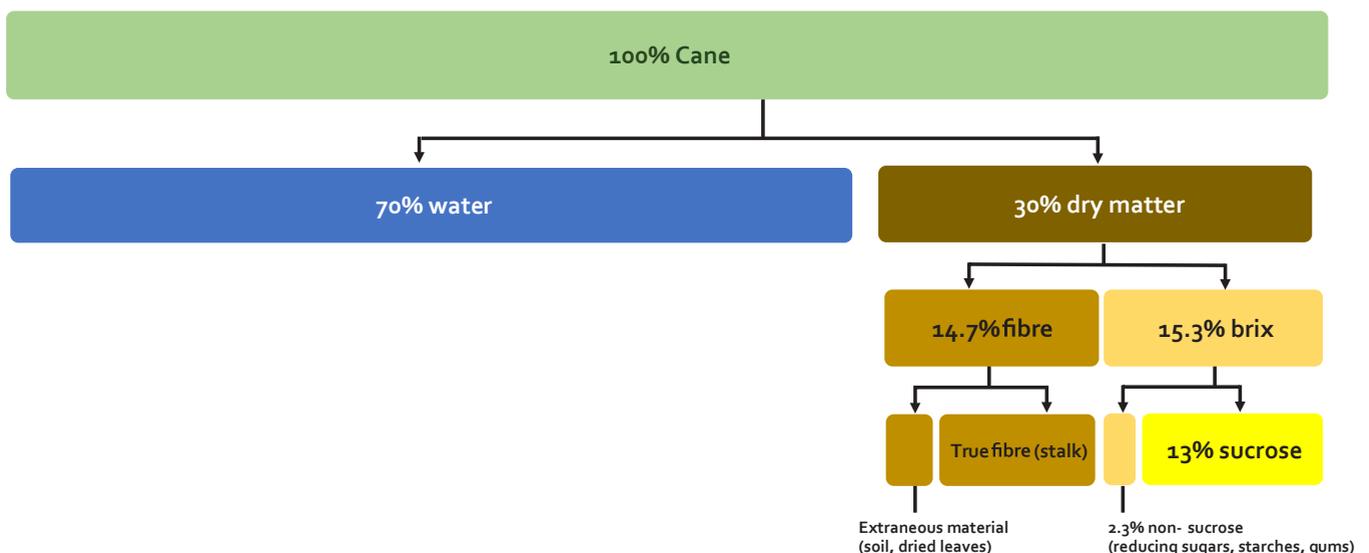
Information Sheet

4.1 – Cane Quality Management under the RV Cane Payment System

In the South African sugarcane industry, recoverable value (RV) is used for cane payment, rather than sucrose content only. To fully understand the RV cane payment system, and how to reap the rewards under this system, it is important to have a basic understanding of the composition of a typical sugarcane stalk.

Composition of a sugarcane stalk

The composition of a sugarcane stalk is shown in the diagram below, with typical breakdown percentages given.



Dry matter is the total of all the solids (both soluble and insoluble) inside the cane stalk. In the example above dry matter accounts for 30% of the stalk fresh mass, with the rest (70%) being water.

Brix is the total soluble solids inside the cane stalk, i.e. sucrose and non-sucrose. In the example above Brix is 15.3%, which accounts for just over half of the stalk dry matter (30%).

Sucrose is a disaccharide and the valuable product under the RV cane payment system.

Non-sucrose consists predominately of monosaccharides (glucose and fructose), but also includes starches and gums.

Juice purity is the proportion of Brix that is in the sucrose form and is expressed as a percentage. In the example above the juice purity is: $[(13/15.3)*100] = 85\%$.

True fibre is the insoluble solids in the cane stalk. However, extraneous matter such as crop residue and soil are also added under fibre.

The RV cane payment system

In the South African sugarcane industry, recoverable value percent cane (RV%) is used for cane payment purposes and determined in cane consignments delivered to the mill.

The formula used to calculate RV% is:

$$RV\% = S - d*N - c*F$$

where S = Sucrose% cane, N = Non-sucrose% cane, F = Fibre% cane

The "c" and "d" coefficients are determined from the income that will be derived from the total industry sales of the sucrose and molasses produced in that season, and therefore vary somewhat from season to season:

c = accounts for the loss in bagasse, which is determined by the fibre content of cane (2020 season coefficient value of 0.028)

d = accounts for the loss in molasses, which is determined by the non-sucrose content of cane (2020 season coefficient value of 0.43)

To allow for fluctuations in cane quality during different weeks of a milling season (e.g. the normal difference in cane quality between the early- and mid-season) an adjustment to the actual RV% value of each cane consignment is made to derive a relative RV% value.

This ensures that the cane price remains relatively constant, and that compensation to growers, that do not deliver cane throughout the season, remains fair.

The adjustment is made by adding the difference between the $RV\%_{\text{season mill average}}$ and $RV\%_{\text{week mill average}}$ to the actual RV% of each delivery for a mill group. The resulting figure is referred to as the relative RV%. In effect, the actual RV% value is raised when $RV\%_{\text{week mill average}}$ is low and lowered when it is above the $RV\%_{\text{season mill average}}$.

Reaping reward under the RV cane payment system

The objective of the RV cane payment system is to encourage growers to improve their cane quality, by more accurately rewarding them for cane quality attributes that improve the actual extraction of sucrose by the mill. The miller monitors the amount of sucrose recovered from each ton of cane crushed. The less cane that needs to be crushed per ton of sucrose produced and the lower the level of impurities, the easier it is to recover the sucrose in crystal form from the cane juice.

Attributes contributing to reaping reward under the RV cane payment system and ensuring high sucrose recovery at the mill

- High sucrose% cane
- High juice purity
- Low fibre% cane
- Low non-sugars, of which the content and nature impacts the cost of sucrose processing and refining. Polysaccharides, which include gums, starch and dextrans, can have a deleterious effect on raw sucrose manufacture and may cause further problems in refining. Other parameters which can affect the quality of raw sucrose are ash, colour, filterability, crystal shape and reducing sugar content.

When evaluating the factors that affect cane quality, it is important to remember that:

Sucrose (S) is the valuable component of sugarcane under the RV cane payment system.

Fibre (F) reduces the extraction of sucrose from the cane, so keeping the F/S ratio as low as possible is important.

Non-sucrose (N) reduces the recovery of sucrose from the juice, so keeping the N/S ratio as low as possible is vital.

Factors that impact reward under the RV cane payment system_____

- Correct selection of varieties and their time of harvest (harvest age, harvest month)
- Climate (e.g. rainfall, temperature, solar radiation) and extreme climatic events (e.g. droughts, flooding, hail, frost and wind)
- Fertiliser management practices
- Disease and pest infestation
- Flowering
- Use of chemical ripeners
- Drying-off
- Harvesting practices (e.g. green cane harvesting)
- Appropriate topping height and base cutting
- Cane deterioration due to harvest to crush delays

The above, and various other factors that can impact reward under the RV cane payment system, are considered in-depth in the various topic-specific Information Sheets available from the SASRI eLibrary available at www.sasri.org.za.

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