

Leaf sampling, a worthwhile venture this time around

Introduction

The recent rains received between January and February 2021 are historical in the sense that: 1) they constitute more than 50% of the total rainfall received since April 2020, and 2) they exceed rainfall recorded within the same period for a number of past years. For example, in the Mhlume area – the ESATS February report indicates that the total rainfall received from April 2020 to February 2021 was 848,7mm, and 508,9 mm (60%) was recorded between January and February 2021. (For more information on the rainfall received during this summer, refer to an accompanying article entitled “historical rise of water levels in the 2020/21 season”).

Nutrients losses

While this is “sweet music” in the ears of every sugarcane grower, the other side is that there was a great chance of losing essential crop nutrients with soil erosion and leaching. This occurred at a time when most sugarcane fields had already been applied with all the recommended nutrients aimed at maximizing crop yields. To estimate possible nutrient losses, growers can conduct any of three tests. (1) Soil test. However, soil test will only show fertility of the soil, ignoring the nutritional status of the standing crop. (2) Plant sap analysis. A plant sap test gives an idea about the nutrients which are available for the plant, at that time, for growth and/or development, and it is synonymous to a blood test in humans. While this is reckoned a superior and precise form of monitoring plant nutrients in a standing crop, there are no acceptable norms for the sugarcane crop. (3) Leaf tissue analysis. Leaf tissue analysis tests the total amount of present nutrients in the dry matter of a leaf. This reflects the nutrients a plant had taken up until that moment.

Threshold values

In the sugar industry, rigorous research was conducted to establish leaf threshold values (TV) [and are continually being refined] below which cane yield is reduced if corrective action is not taken on time. Leaf tissue analysis is the only viable option available for growers’ use to verify if their sugarcane crop is not deficient of any of the essential nutrients necessary for optimal plant growth. Crops that will benefit from this exercise are those harvested from September ($\leq 6,0$ months). With these, nitrogen (N) and potassium (K) deficiencies can still be corrected. [Phosphorus – because of its immobile nature in the soil, cannot be corrected at this stage, however, the results are pertinent as they inform fertilizer strategies for the next crop]. Growers are reminded that leaf sampling should be done at least four weeks after the last fertilizer application. This should be done when the crop is not under moisture stress and growth was vigorous at least the past four weeks. [For more information on leaf sampling, growers are referred to the industry’s best management practice manual in the ‘crop nutrition’ chapter].

Recommendations

Tables 1 and **2** give guidance on the quantities of N and K that can be applied to correct deficiencies shown by leaf analysis results. These were sourced from SASRI’s Information Sheet 7.17 “Guidelines for the interpretation of leaf analyses for sugarcane”.

Table 1. Amounts of N to be applied to correct deficiencies detected through leaf analysis.
[TV: threshold value]

N% in leaf	0.4% or more below TV	0.3-0.4 % below TV	0.2% below TV to TV	Greater than TV
N required (kg/ha)	100	75	50	0

Table 2. Amounts of K to be applied to correct deficiencies detected through leaf analysis [TV: threshold value]

K% in leaf	0.2% or more below TV	0.1-0.2 % below TV	0.1% below TV to TV	Greater than TV
K required (kg/ha)	150	100	50	0

Note: Potassium should be applied only in cases where the leaf K deficiency is associated with an adequate N level in the leaf

Growers are encouraged to take this seriously, the excessive leaf senescence being observed particularly in most mid to late season cut fields is a cause for concern. And a majority of these fields are showing signs of retarded growth, and late cut fields are known to suffer from a phenomenon known as reduced spring growth phenomenon. So, taking leaf samples for analysis at the laboratory will eliminate any alleged association of this anomaly with nutrient deficiencies.

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