

REVIEWED LABORATORY ANALYSIS PACKAGE

Introduction

During the past two seasons, the Technical Services department of SSA (SSATS) and the Agriculture Laboratory of RSSC, in collaboration, were reviewing the analytical methods, the suite of elements and properties tested (for both soil and plant tissue) to adopt best practices. The aim was to improve the procedures of estimating levels of plant growth and yield affecting factors such as nutrient elements, soil organic matter and texture. The ultimate goal being to afford growers with more accurate fertilizer recommendations that will address all nutritional needs of their sugarcane crop.

Micro elements

Until recent, laboratory soil and plant leaf tests were largely focused on nitrogen, phosphorus, potassium, calcium and magnesium. Micro elements (zinc, iron, manganese, boron, copper and molybdenum) were not included in the spectrum of plant nutrients analysed. Current soil studies are showing that soils of the sugar industry are running low on some micro elements and sulphur. If these are not corrected on time, cane yields will be hugely affected and it will be very expensive to do so if there are delays since huge quantities will be required.

For example, 76% of local growers' soil samples (656) sent to SASRI Fertiliser Advisory Services for analysis in the 2016/17 season were deficient in Zn (Figure 5). A similar study conducted in the state of São Paulo (Brazil)

evaluating the content of Zn in 890 diagnostic leaves of sugarcane specimens reported that more than 70% of the sample had zinc content below the critical level. Literature indicates that Zn is one of the most important among the essential micro elements since its deficiency poses a greater risk to plant productivity. Zn deficiency directly affects the sugarcane plant's tillering, growth and ratoon longevity.

Soil texture and organic matter

Checking soil texture and organic matter has always been optional for growers. This was always presenting difficulties in providing accurate fertilizer recommendations when the levels of clay and soil organic matter were unknown. These two soil parameters are critical in determining the availability of certain essential plant elements.

Reviewed analysis

As a result, the laboratory reviewed its routine analysis to include micro elements (even for leaf analysis), soil organic matter and texture. This review was approved by the relevant authority structures of the industry. In the meantime, SSATS is upgrading the fertilizer recommendations programme to include the micro elements. For more information on these changes or any other related matter, growers can contact SSATS or the RSSC Agriculture Laboratory.

By Njabulo Dlamini (Agronomist)

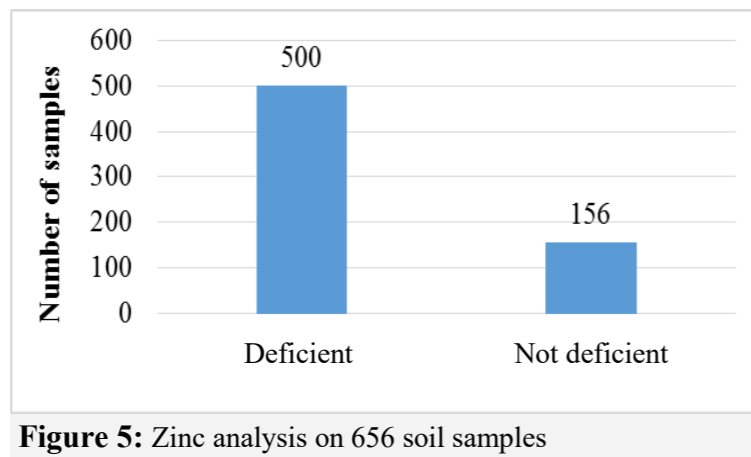


Figure 5: Zinc analysis on 656 soil samples



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IRRIGATION IN WINTER

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USE ELECTRICITY IN A SUSTAINABLE MANNER

Irrigation in winter

“As the sugarcane water requirement drops in winter, the irrigation frequency is expected to be decreased as well”

Update on smut in the 2017/18 season

“...the average industry smut level has been on the increase since the 2013/14 season”

Reviewed laboratory analysis package

“Checking soil texture and organic matter has always been optional for growers.”

Introduction

The winter season (May to July) is the time when crop water demand is at the lowest as shown by the evapotranspiration (ET) long term mean (LTM) values in Figure 1 for the Lowveld region. Some growers, in spite of this, continue to apply water at the same frequency and quantity as in summer. As the sugarcane water requirement drops in winter, the irrigation frequency is expected to be decreased as well. This is possible if proper irrigation scheduling is practised on the farm.

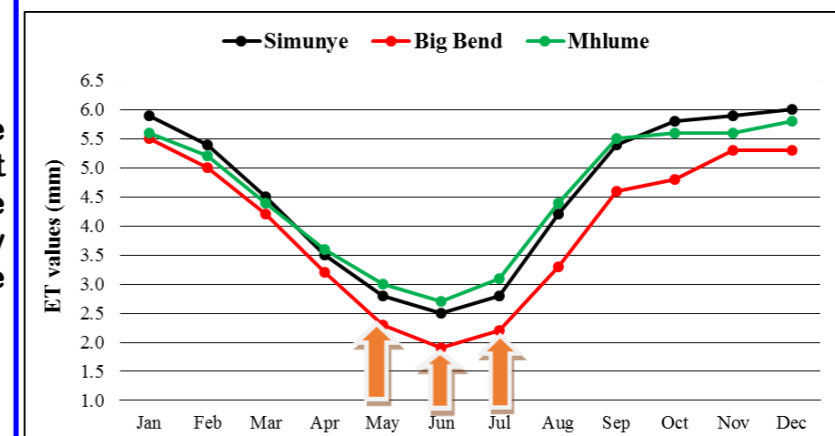


Figure 1: Average LTM crop water demand for the Lowveld

Plant growth stages and water requirements

Growers need to be aware of the correlation between crop water requirements (CWR) and the plant growth stages. Young cane uses less water compared to cane at full canopy cover. The intensity of water use at different growth stages is represented by the canopy or crop factors (Kc) (shown in Table 1) which vary in the growing season depending on the time of planting or harvesting. The Kc is used to calculate the

amount of water to apply when irrigating. This is done by multiplying the ET by Kc.

Irrigation scheduling

Growers are advised to properly schedule irrigation even during the cold season despite the presence of windy days and absence of rainfall. Proper scheduling ensures that water resources are optimised. It is very important to apply the required amount of water because over irrigating affects plant growth, leaches nutrients, increases weed incidences and leads to salinity and sodicity problems. These problems are already showing in some farms in the sugar industry. Unnecessary irrigations also result in high costs of irrigation.

Excessive water in the soil in winter can lead to frost formation if temperatures drop to very low

levels. Over-irrigation also wastes electricity and water. But when irrigation events are properly scheduled, the sugarcane crop will be correctly irrigated thus proper growth and good yield can be achieved. Available irrigation scheduling tools such as Profit and loss, Canesched, and Canepro must be used.

Forecast

It is expected that less water will be used this winter due to sufficiently

IRRIGATION IN WINTER... CONT.

charged soil reservoirs from the substantial rainfall received in March to May 2018 (see Table 2).

Winter irrigation strategy

Despite the improvements in water levels, growers should continue to follow water saving practices accordingly. The winter irrigation strategy is to irrigate the field to the soil's total available water (TAW) after harvesting, then delay subsequent irrigations as shown in Table 3. It is also recommended that after the first or second irrigation, the next irrigation should be delayed until the 5th leaf (stem elongation) stage.

Table 1: Canopy Factors by month of planting or harvest

Plant or harvest month	Scheduling month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Apr	1.00	1.00	1.00	0.40	0.40	0.55	0.78	0.93	1.00	1.00	1.00	1.00
May	1.00	1.00	1.00	1.00	0.40	0.40	0.40	0.49	0.76	0.96	1.00	1.00
Jun	1.00	1.00	1.00	1.00	1.00	0.40	0.40	0.40	0.46	0.8	0.97	1.00
Jul	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.40	0.40	0.73	0.96	1.00
Aug	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.40	0.58	0.88	1.00
Sep	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.40	0.70	0.95
Oct	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.43	0.78
Nov	0.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.46
Dec	0.45	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40

According to the Meteorological Services department, maximum temperatures are forecasted to be normal to below-normal this winter; indicating that this winter may be colder than a normal winter. The weather experts also forecasted rainfall to be normal in most areas except in the southern part of the country where it is projected to be normal to above

Table 3: Water saving winter strategy

Harvest month	Month of the year and irrigation events									Total irrigation events	Savings (%)
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Apr	1	1			1	1	1	2	2	9	39
May		1	1			1	1	2	2	8	41
Jun			1	1			1	2	2	7	35
Jul				1	1		1	2	2	7	29
Aug					1	1	1	2	2	7	16
Sep						1	1	1	2	5	27
Oct							1	1	1	3	39

Table 2: March to May 2017/18 & 2018/19 rainfall

		Mar	Apr	May	Total
Malkerns	2018/19	200.0	76.6	36.2	312.8
	2017/18	57.3	28.8	37.8	123.9
	LTM	108.2	57.6	22.7	188.5
Mhlume	2018/19	168.5	26.7	68.7	263.9
	2017/18	71.3	23.0	18.2	112.5
	LTM	84.3	52.9	20.1	157.3
Simunye	2018/19	110.2	19.6	63.8	193.6
	2017/18	81.3	17.3	13.5	112.1
	LTM	78.0	36.8	17.5	132.3
Big Bend	2018/19	101.8	8.3	76.3	186.4
	2017/18	36.7	14.0	14.4	65.1
	LTM	71.7	39.6	16.6	127.8

tion should be delayed until the 5th leaf (stem elongation) stage.

Moreover, electricity is more expensive in winter from June to August (High Demand Season), and less expensive during the low demand season (September to May). Growers are advised to use electricity watchfully to avoid unnecessary payments. The winter strategy is one way of reducing electricity usage during the electricity peak period.



By Patrick Mkhali (Irrigation Officer)

UPDATE ON SMUT IN 2017/18 SEASON

Introduction

The smut inspection season for SSA Pest and Disease teams starts at the beginning of September till the end of February of every season. During this period, the teams visit fields throughout the industry doing inspections following grower harvest programmes. Cane of 3 to 5 months of age is inspected during this period. (Figure 2 shows a smut infected cane)



Figure 2: Smut whip on a sugarcane plant

2017/18 season

A total area of 43 593,80 ha which is 78,45% of the total harvested area was inspected. The industry average infection level for 2017/18 season was 0,65% which indicates an increase of 21,55% when compared with the 2016/17 industry average of 0,53%. This increase can be attributed to increased smut spores and stressed cane due to the El Nino induced drought experienced from 2014 to 2016. Weighted infection levels were 0,40% at Mhlume, 0,33% at Sidvokodvo, 0,33% at Simunye, 1,07% at Big-Bend, 0,66% at Nsoko and 0,01 at Malkerns. There were increases in all the regions except Malkerns when compared to last season. Since 2013/14, the industry average has been on the increase.

Varieties

Variety N25 was the dominant variety as it covered 39,99% of the total area inspected, N23 covered 23,54%, NCo376 covered 8,88%, and N19 covered 8,05%. The highest infection levels were recorded in varieties N24 (1,62%), M1176/77 (1,27%) and N41 (0,93%). These were 235,64%, 185,22% and 135,98% above the benchmark infection level of 0,69% recorded in NCo376 (Figure 3).

Listed growers

There were 64 growers listed for recording average smut percentages above their mill area averages.

This number reflects a 1,59% increase when compared to last year's total of 63 growers who were listed for recording infection levels above their mill

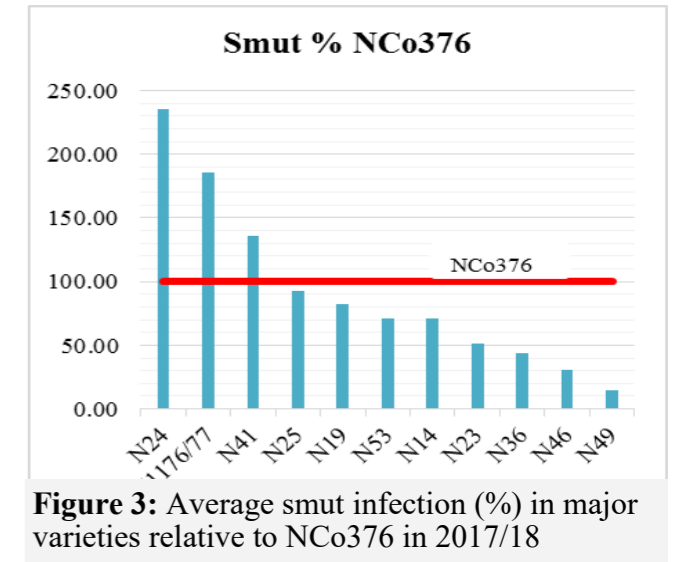


Figure 3: Average smut infection (%) in major varieties relative to NCo376 in 2017/18

are averages. There was one compulsory plough out order issued this season for excessive smut infection. The grower applied for one year deferment which was granted by her mill group. The fact that the average industry smut level has been on the increase since the 2013/14 season is a real concern (Figure 4).

Regulations

Growers are urged to adhere to the Pest and Disease control recommendation and regulations.

Industry 5 Year Smut Trend

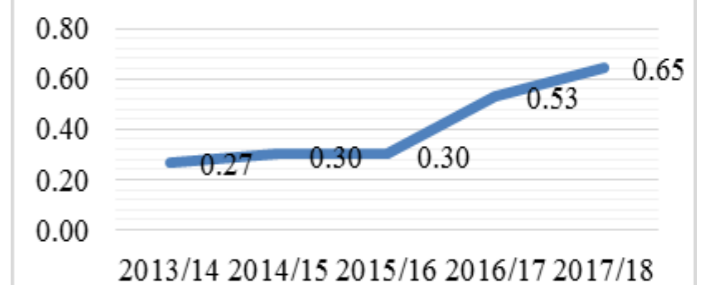


Figure 4: Smut trend over the past five seasons

Growers are further encouraged to continue using certified seedcane for planting, intensify roguing of all fields paying more attention to fields that were listed with higher smut levels than average and to constantly work with their extension officers.

By Mphumelelo Ndlovu (Crop Protection & Extension Officer)