

WATER-SAVING WINTER STRATEGY

Planning

The dry period is still affecting water resources. Rainfall has been below long term mean for the past six months. This has resulted in reduced dam levels in the sugar industry. The weather forecast is not predicting substantial rains in the near future. Therefore judicious use of the available water is required. Growers are advised to use water sparingly in this winter

Normal irrigation

Sugarcane harvested between April and August does not require to be irrigated frequently because evapotranspiration (ET) is generally at its lowest in winter. Normal irrigation strategy is shown in Table 1. The numbers in the table indicate the recommended irrigation events/cycles that should be applied after a field has reached full TAM after dry-off (first irrigation).

Table 1: Normal winter strategy irrigation events

Harvest month	Month of the year										Total irrigation events
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Apr	2	1	1	1	2	2	2	2	2	2	15
May	-	2	1	1	1	2	2	2	2	2	13
Jun	-	-	2	1	1	1	2	2	2	2	11
Jul	-	-	-	2	1	1	2	2	2	2	10
Aug	-	-	-	-	2	1	2	2	2	2	9
Sep	-	-	-	-	-	2	1	2	2	2	7
Oct	-	-	-	-	-	-	2	1	2	2	5

season. This requires planning for future irrigation requirements and following a carefully programmed irrigation scheduling. Planning involves making decisions on the irrigation activities to be followed for the coming season.

drop as crop water demand declines. In addition, some sugarcane fields are already on dry-off. Hence, water conveyance structures and irrigation equipment may not be fully engaged during this period. This is therefore the right time for growers to execute their irrigation maintenance plans and address any bottle-necks affecting water supply and farm irrigation. These include desilting and repairing water conveyance structures, maintenance of pumps, repairing and/or replacing worn out irrigation equipment.

Table 2: Water-saving winter strategy irrigation events

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

SOIL SAMPLE BOXES

SSATS will soon be introducing soil sample boxes similar to the ones used at SASRI. Firstly, it is anticipated that this move will make it easier for growers to package their soil samples in an improved manner. Secondly, the introduction of these boxes will help reduce the volume of soil growers submit to the laboratory for analysis, hence the ease of handling will be greatly improved.

Growers will get further details from their respective Extension Officers on logistical issues and accessibility once the boxes become available. For more information on soil sampling, growers are encouraged to contact their Extension Officers or SSATS.



Figure 4: SASRI soil sampling box

Strategy

However, this is a difficult year and growers are advised to implement a more rigorous winter-saving strategy as shown in Table 2. This strategy will help to spread the available water over a longer period thus minimizing yield decline due to lack of water.

Maintenance

With winter already here, the frequency of irrigation cycles is expected to

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EXTENSION NEWSLETTER

Number 59

1st Quarter 2015/16

TRIAL YIELDS VERSUS COMMERCIAL YIELDS, WHY THE DIFFERENCE?

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An update on Yellow Sugarcane Aphids is attached on this issue

Trial and commercial yields

"...variety trials often overestimate the performance of varieties under commercial basis"

RSSC signs two EU grant contracts

"...the beneficiaries are Mnyangombili and Umbombo Wendlovu"

Water saving winter strategy

"...growers are advised to implement a more rigorous winter-saving strategy"

Introduction

The Technical Services (TS) of the Swaziland Sugar Association (SSA) conducts sugarcane variety evaluation trials in an on-going basis. Imported varieties are tested for performance under different conditions including soil types and harvest times. The results of these trials inform the variety recommendations programme of SSA. In addition, the yields obtained from these trials enable growers to predict the likely performance of the varieties under similar conditions. However, post release variety trials often overestimate the performance of varieties under commercial basis. There is overwhelming evidence from literature of the existence of this gap not only in sugarcane and other commercial crops, but also in livestock. Locally, growers share similar sentiments that trial yields published by SSATS are too high and unrealistic when compared to commercial yields.

Many researchers in a bid to eliminate this confusion express trial yields as percentages instead of tons per hectare. However, most growers place much emphasis on actual trial yields, and use these results as a basis for comparison with their own productivity figures. Thus, the purpose of this article is to shed some light on this phenomenon of disparity between trial and commercial yield results.

Literature

In sugar industries elsewhere where this disparity is a cause for concern, studies were carried out to establish if there is a relationship between trial

yields and commercial yields.

South Africa

A study conducted by Dr Ramburan, a crop scientist at the South African Sugarcane Research Institute (SASRI), revealed that indeed trial results were consistently higher than commercial yields over the 26 years data that was under scrutiny.

The differences between trial and commercial cane yields for individual years ranged from 14 tons per hectare (TCH) to 50 TCH, with an average difference



Figure 1: Commercial sugarcane fields

of approximately 30 TCH. Interestingly, the trial yields unswervingly followed the same trend as commercial yields over the period studied. In other words, during years of high cane yields, trial yields were also high and on years of low cane yields, trial yields were low as well. This demonstrated that indeed a relationship existed between trial and commercial yields. Hence, trial yields could be used to predict/estimate commercial yields under similar conditions using a correction factor (CF) or regression line. Since the performance of a variety is influenced

TRIAL YIELDS VERSUS COMMERCIAL YIELDS... (CONT.)

by the environment under which it grows, Ramburan established different CFs for the different mill areas of South Africa. CFs for the three SA irrigated areas closer to Swaziland, that is Pongola, Komati and Malelane were 0.77, 0.83 and 0.90, respectively. However, the average CF for the entire SA industry was 0.70. The dissimilar CFs between the areas was an indication that different environments affect crop performance differently, a phenomenon historically called genotype by environment interaction.

Mauritius

Research Scientists Bissessur, Ramnawaz and Ramdoyal at Mauritius Sugar Industry Research Institute (MSIRI) in a study comparing yields in trials and commercial fields also found that trial yields overestimate commercial production. These authors used historical data covering four crops (plant plus 3 ratoons) from MSIRI clonal trials and corresponding commercial fields planted in similar conditions. The trial data fitted (62%) well with the commercial yields. Hence, they concluded that the mean commercial cane yield as a percentage of the mean experimental cane yield was 85.5% (CF = 0.86) showing that the trials predicted commercial performance accurate enough for practical purposes.

Australia

In Australia, researchers Davidson and Martin stationed at the University of Western Australia conducted similar trials to ascertain the relationship between yields on farms and in experiments. These workers used data from the Queensland Bureau of Sugar Experiment Stations together with reports on variety trials published in Canegrowers' quarterly bulletins spanning over 12 years. Davidson and Martin concluded that an average farm yield was 76% (CF = 0.76) of average experimental yield. This finding is in agreement with the theory that although trial yields overestimate commercial performance but a relationship exists between these yields. Acknowledging the environmental effect on variety performance, these authors cautioned that any conclusions drawn from experimental yields should be treated with care.

Why the differences?

There are several reasons why trial yields are consistently higher than commercial yields, and the major ones are mentioned below:

1. **Spatial variability.** Trials are often conducted in smaller plots while commercial production covers very large areas. There is evidently lower variability in smaller plots compared to the high degree of spatial variability in commercial fields.
2. **Crop management.** The general attention paid on trials often exceeds that focused on commercial fields. Hence, in most cases the crop stand in trials is ordinarily better than that of commercial fields.

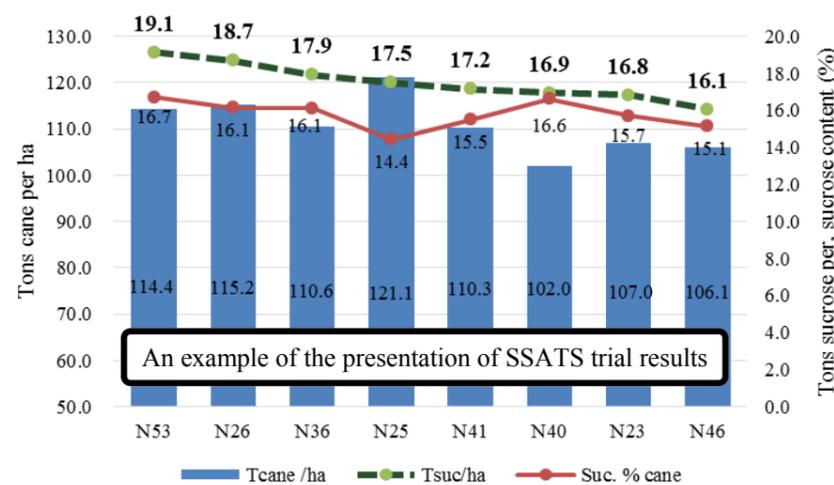


Figure 2: Performance results of 8-varieties averaged over 3-crops in M-set soil, harvested late season and not ripened

3. **Trial sites.** More often trial sites are allocated on relatively favourable field conditions (uniform fields, flat seedbeds) and more prominent grower co-operators.

4. **Harvesting practices.** At harvesting, the net area is considered in trials while the guard rows and end-row effects are eliminated. This may be interpreted to provide some protection to trials which is not available to commercial fields.

Way forward

SSATS will conduct study similar to the studies quoted in this article to ascertain if there is any relationship between trial and commercial yields in the different cane growing areas Swaziland. Once this is established, the nature of the relationship will be determined to enable growers to adjust SSATS trial yields accordingly when estimating own yields under comparable conditions.

By Njabulo Dlamini (Crops Agronomist)

RSSC SIGNS TWO EU GRANT CONTRACTS

Beneficiaries

The Royal Swaziland Sugar Corporation (RSSC) has signed two European Union (EU) grant contracts for an additional 850 ha Outgrowers land. The target beneficiaries are Mnyangombili Farmers Limited (400 ha) and Umbombo Wendlovu Multi-purpose Cooperative Society (450 ha). These two farmers' organisations will soon be reaping the fruits of their perseverance, since both groups were established over 10 years ago. Since then they have been negotiating with various development institutions including RSSC and SWADE for financing.

In April 2013 the Aid Coordination and Management Section of the Ministry of Economic Planning and Development invited calls for proposals in which only the sugar mills were eligible to apply. RSSC therefore submitted applications for these farmer groups and the applications were successful after a rigorous selection process which was concluded in January 2015.

Tasks

Following the signing of the contracts, SWADE and RSSC engaged the farmers in a capacity building training. At the same time RSSC is preparing tenders for the various jobs that need to be done before sugarcane is planted. The major tasks that need to be done are: Environmental and Social Impact Assessments, over 6 km bulk water conveyance infrastructure for each scheme, storage dams, irrigation systems installation, bush clearing, land preparation and sugarcane planting. Over and above the sugarcane projects, there are social

components which entail potable water supply and building of teacher's houses.



Figure 3: Log Frame training

Both projects will run for 3 years and planting is expected to start in July 2016.

Application Process

- Farmers form their legal entity
- Land allocation letter
- Pre-feasibility analysis
- Water permit
- Sucrose quota
- Business plan
- Loan and Grant Applications (for grants you have to wait for calls for proposals)
- Project Implementation.

By Sydney Dladla (Extension Services Manager, Royal Swaziland Sugar Corporation)

Do chemical ripeners reduce yields?

In a number of forums, growers expressed concern that chemical ripeners reduce cane yields. The first concern relate to ethephon. Growers are concerned that ethephon reduces stalk height, hence yield. Ethephon does have a physiological effect on cane stalks. The internodes, normally one or two, vigorously elongating at the time of ethephon application are relatively shortened and (often times) slightly distorted compared to the internodes below and above. However, this morpho-physiological change does not amount to reduced cane yields. Ethephon is a hormone not a weedicide like most chemical ripeners used in sugar industries. The other concern relate to reduced crop cycles (ratoons) and ratoon yields following application of fusilade forte. Fusilade is a herbicide, if used wrongly, will surely have deleterious effect on grower economics.

Most growers, in pursuit of higher sucrose content and reduced haulage costs "over-ripen" their cane by using higher fusilade rates and/or extending spray to harvest times well beyond recommendations. In a commercial trial conducted last season (2014), where higher fusilade rates were used than recommended and harvesting operations were severely delayed, the higher sucrose content obtained did not compensate for the reduced sucrose yield (cane yield x sucrose content). Chemical ripeners, when used as recommended, reduction in cane yields should not be statistically significant. Even when the reduction occurs, as happen often times, the relative increase in sucrose yield off-sets the loss incurred on cane yield.

By Njabulo Dlamini (Crops Agronomist)