



EXTENSION NEWSLETTER

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HARVESTING LOSSES

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“infield cane losses were significantly lower where the cane was manually cut”

Two field-scale mechanical harvesting experiments were conducted at Simunye sugar estate in October 2000 and July 2001.

The work was a collaborative project between the Agricultural Engineering Department of SASEX, SSA Technical Services, the Royal Swaziland Sugar Corporation (RSSC) and Unitrans Agricultural Services. Eddie Meyer of SASEX recently visited Simunye to report back on his 2001 results. A summary of his findings in both experiments is given in this article.

Objectives

The experiments were conducted primarily to establish cane losses when using mechanical loading and chopper harvesting systems. Secondary objectives were to assess the quality of cane delivered to the mill and record instantaneous operating rates of machinery and equipment for each system.

Method

On both occasions, a single field of up to 30ha of mature NCo376 was selected as the trial site. Fields were selected on the basis of area, uniformity (where possible) and freedom from lodging and stones. After encountering uniformity problems in a low-yielding, surface-drip irrigated field in 2000, a 1st ratoon sub surface drip field was selected for the experiment in 2001. “Treatments” were then allocated to the field, and repeated (replicated) at random up to 12 times across the field area. A single replicate of one treatment had to be large enough to fill at least one 40t load of cane.

Treatments

“Treatments” comprised different harvesting systems. Burnt hand-cut cane loaded into bins with push-pile loaders was the standard against which other systems were compared. Other treatments included burnt machine-cut cane and green machine-cut cane (Figure 1).

Loss measurements

Loss assessments were carried out on the stubble left after the harvesting operations were complete. Stalk pieces, millable tops, whole stalks, stubble and billets were collected from a small area in each plot and weighed.

Results

In both years, infield cane losses were significantly lower where the cane was manually cut and mechanically loaded by push-pile loaders compared with cane harvested by chopper harvester. Total losses were as high as 6% in green machine cut cane. In burnt machine cut

cane this was reduced to 4 – 5%, which compared to an overall average of 2.8% in hand cut cane.

In the October 2000 experiment, cane quality of hand cut, mechanically loaded treatments was better than the mechanically harvested treatments. Cane quality of mechanically harvested burnt cane was better than mechanically harvested green cane. This contrasted with the July 2001 experiment, when there was no difference in quality between manual and mechanical systems, or between burnt and green cane. The field harvested in July 2001 was much higher yielding than the field harvested in October 2000. It had also been chemically ripened and was harvested under ideal conditions. These features are likely to have caused the differences in results between the two years, and indicate the importance of selecting uniform field conditions for this kind of work.

Chopper harvester performance varied considerably according to machine design, cane yield and crop and field conditions. Throughput was best in burnt cane in the high yielding field harvested in July 2001.

CROP ALERT

The prolonged wet spell in November has left fields saturated and has interrupted harvest at Mhlume and Big Bend.

Although labour may be needed to carry out cane, don't forget to pay attention to:

- Surface drainage
- Smut roguing
- Weed control
- White grubs

Growers should get into their fields and assess the priorities before the Christmas break.

EARLY SEASON RIPENER RECOMMENDATIONS

The chemical ripener campaign for the 2002 harvest will soon be upon us. Early season ripener recommendations for our main varieties (NCo376, N14, N19, N23 and N25) are summarized below.

Varieties

Varieties differ in their response to chemical ripeners. Experiments are conducted annually to refine recommendations for the newer varieties, and up to date information can be obtained from SSA Technical Services. Current recommendations for approved varieties are given in [Figure 2](#).

Application rates

Ethephon should be applied at a rate of 1.5 l/ha to all suitable varieties. The rate of Fusilade varies from 0.35 l/ha for N25, 0.35 to 0.45 l/ha for NCo376, N19 and N23, and 0.45 to 0.6 l/ha for N14. Where a range of Fusilade rates is given, the higher rate acts slightly quicker and produces more pronounced symptoms, usually leading to better burns at harvest. Any extra improvement in cane quality from the higher rate is often accompanied by a greater reduction in cane fresh weight so that there is little or no change in sugar yield per hectare.

Timing of application

Early season spray to harvest intervals in a normal year range from 10 to 12 weeks for ethephon and 6 to 8 weeks for Fusilade for a crop harvested in early April. As the winter approaches and temperatures fall, both chemicals require longer to work. Spray to harvest intervals for a crop harvested in early August are normally 14 to 17 weeks for ethephon and 11 to 12 weeks for Fusilade. For variety N19, the spray to harvest intervals for ethephon and Fusilade should not exceed 15 weeks and 10 weeks respectively. There should always be at least four weeks between Ethrel and Fusilade application dates when the combination treatment is being used. It is rarely necessary to apply ripeners to fields due for harvest between mid August and early October, when the natural sucrose content of most varieties is at its highest.

Crop condition

When planning your ripener application programme, bear in mind that the most consistent responses to ripeners are obtained when sugarcane crops:

- Are immature and growing vigorously when the chemical is applied. When available, juice purity can be used as an indication of the crop's maturity. It should be less than 75-78% for Ethrel application and less than 85% for Fusilade application.
- Have the potential to continue active growth for at least a further 3 to 4 weeks.
- Have at least 8 green leaves per stalk.
- Show no signs of nutrient deficiency.
- Are free of pest and disease problems.
- Exhibit less than 25% flower emergence.

Moisture stress should be avoided for at least 3 - 4 weeks after the application of ripeners to obtain the best results. Normal drying off procedures can then be followed, according to the soil type and its moisture holding capacity.

Immature early season cane

In view of the low radiation experienced so far this year it is probable that crops harvested early in the season will be physiologically immature and growing vigorously when ripeners are applied. This does not need any adjustment in rates

Variety	Ripener		
	Ethephon	Fusilade	Ethephon + Fusilade
NCo376	8	8	88
N14	x	8	x
N19	8	8	88
N23	8	8	88
N25	x	8	x
8	Recommended		
88	Highly recommended		
x	Not recommended		

Figure 2: Recommended ripening treatments for major varieties

time of ethephon treatment. However, because Fusilade Super checks stalk growth there can be a loss of yield if crops are not harvested at the correct time, especially when they are growing rapidly.

In very immature crops of NCo376, N19, N23 and N25 due for harvest in April and May it is recommended that the time between spraying Fusilade and harvest should be reduced by one week. For N14, which is usually left longer than other varieties after spraying, the interval should be reduced by two weeks in very immature crops.

The normal interval between spraying and harvest should be allowed for crops harvested after May.

Please contact SSA Technical Services (telephone 383 8998) if you wish to discuss your ripener programme. Updated ripener recommendations with detailed spray to harvest intervals are available from SSATS. They can also be found in the new SSA Sugarcane Production Manual (see page 4 of this newsletter). Note that a formatting error has occurred the version of Figure 2 (above) given in the manual, resulting in the ✓ symbol being printed as the number 8.

Please note that Technical Services offices at Simunye and Big Bend will be closed between Christmas and the New Year. We wish all our readers and their families a happy Christmas and a prosperous and peaceful New Year .

AGRONOMY TRIAL RESULTS

Some interesting results have come out of SSA's agronomy trial programme this year. The programme has focused on variety performance, chemical ripeners and crop nutrition.

Variety performance

Varieties N26 and N32 were introduced to the programme in 1999, and planted alongside chemically ripened NCo376 and N23 in a series of early season trials. Results from two plant crops and one 1st ratoon at Ubombo suggest that N26 may prove to be useful for cultivation on well drained soils for early season harvest (Figure 3). Results will have to be repeated over a number of ratoons before the variety can be recommended to the industry. In other trials, N28 and N30 were generally less promising, while N23 and N25 continued to perform well.

Fertigation

Two fertigation trials were harvested this year, one early season and one late season. The purpose of the trials was to determine the best policy for splitting N fertiliser application through sub surface drip. Treatments included two heavy applications of N shortly after harvest or planting ("conventional"), equal applications of N once a month for the first 4 to 5 months of growth ("rational splits") and continuous application according to the modeled N uptake curve of the crop ("modeled splits"), which extended over 9

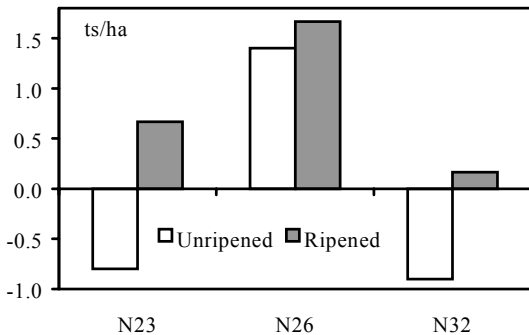


Figure 3: Difference in sucrose yield between varieties and

months in the early season trial.

Results indicated that the rational and modeled splits produced higher cane and sucrose yields than the conventional split in a late season cycle. In an early season cycle cane yield did not differ substantially among N treatments, but cane quality was reduced more the closer to harvest N was applied, negating any yield benefit from splitting.

These trials will be continued, but results to date indicate that there is little benefit from splitting N application over longer than a 5 month period in either an early or late season cycle (Figure 4).

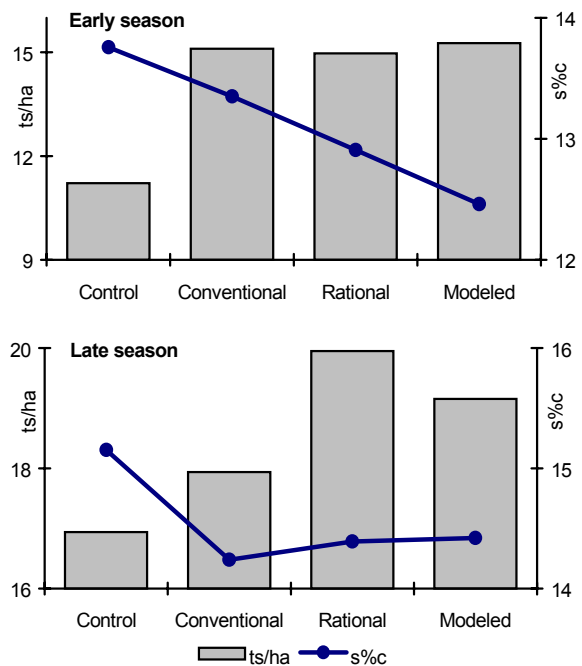


Figure 4: Results of early and late season fertigation trials. N treatments received 80kg N/ha, control received 0kg N/ha.

WATER USE EFFICIENCY

Two meetings were held in the region during October to discuss and highlight technical and management issues that affect water use efficiency in irrigated sugarcane. This is becoming a major issue as water use in the region comes under increasing legal, economic and environmental pressure.

1. Swaziland Water Use Efficiency Day

SSA Technical Services held a water use efficiency day on 16th October at the Simunye Training Centre. The day was organised as a technical meeting to update industry stakeholders and government and university officials on the sugar industry's efforts to improve water use efficiency. A number of presentations were made that focused on the development and application of technology that contributes to the industry's efficient use of water.

The presentations were followed by field visits to Simunye, Mhlume and Tambankulu to view sub surface drip, centre pivot and furrow irrigation systems in use.

The day was a success and gave us the opportunity to dem-

onstrate how Swaziland is making progress to become one of the most responsible users of water among the world's sugar industries.

2. S.A. Sugar Industry Agronomists Association

The AGM of the South African Sugar Industry Agronomists Association was held on 25th October 2001 at Kwa-Shukela, Mt Edgecombe. The theme for the meeting was "Water use efficiency: potential and constraints". Ten papers were presented covering agronomic and engineering aspects of water use efficiency.

Mark McGlinchey presented a paper entitled "Robust Evaporation Estimates - Results from a Collaborative Project" describing crop modeling work undertaken in collaboration with CSIRO in Australia. Oswald Magwenzi reported on his measurements of efficiency of subsurface drip irrigation in Swaziland. Consensus was sought at the meeting for the adoption of a common framework that will help to standardise water use efficiency terminology and measurement in practice.

24TH ISSCT CONGRESS

The 24th congress of the International Society of Sugar Cane Technologists (ISSCT) was held in Brisbane, Australia, in September. Mark McGlinchey attended the congress on behalf of SSA Technical Services.

A total of 70 oral papers and 50 poster papers were presented in the Agricultural Sessions. The oral papers were dominated by South African and Australian authors.

Yield decline

Yield decline and possible solutions to this problem dominated the first two sessions. Soil degradation was cited as the main cause of this plateau or decline. In Australia the Yield Decline Joint Venture (YDJV) has shown convincing evidence of the benefits of break crops and long fallows on subsequent sugarcane yields. In South Africa management practices such as trash blanketing and vertical mulching were proposed as beneficial to reducing the rate of soil degradation.

Crop modeling

There were a number of papers on crop model development and application. Geoff Inman-Bamber and co-authors presented an overview of the two main sugarcane simulation models, CANEGRO (South Africa) and APSIM (Australia). Experiences gained during the past decade in development, validation and application were presented to highlight the usefulness of these models in industry applications. Mark McGlinchey was a co-author in this paper and the model applications (yield benchmarking, seasonal forecasts) developed in Swaziland were offered as good examples of the use of models to address real industry problems. Peter Thorburn presented the progress made with APSIM in developing a nitrogen model capable of simulating the dynamics of nitrogen cycling in sugarcane.

Irrigation

Only one paper dealt with irrigation. Leonard Ndlovu and co-authors presented a paper on the conversion of sprinkler fields to sub-surface drip irrigation at RSSC. Results of the first year of harvest suggested improved yields, water and labour savings as a result of the change.

High density planting (HDP)

Terry Bull and co-authors presented a paper on "New farming systems for sugarcane production". This group led the HDP initiative in Australia. The HDP project has recently been reviewed and funding was subsequently halted by the Sugar Research and Development Council (SRDC). The authors concentrated on the benefits associated with controlled traffic and reduced compaction that can be obtained from alternative row configurations and ignored the previously published large yield benefits associated with this system.

Loading and haulage systems

A third paper from Swaziland by Rod Ellis and Mandla Tshawuke reported on the developments and performance of a revised cane loading and haulage system at Simunye. The performance of two harvesting seasons, one pre and one post the change were assessed for cane quality (ash) and mill performance.

The conference was well organized and the proceedings were available on time. A copy is available for use at the SSA TS Simunye office library (tel. 383 8998).

SSA SUGAR MANUAL

The Swaziland Sugarcane Production Manual is a new publication produced by SSA Technical Services. It brings together advice and information on the production systems and technology currently available to sugarcane growers in Swaziland.

It also includes a 12 page bulletin introducing new growers to the business of producing cane. The entire manual will therefore be of use to both established producers and first time growers, both large and small scale.

The manual and bulletin together comprise 187 pages printed in full colour. They are available either in a bound form or loose-leaf in a Bantex file. The file can be added to as recommendations are updated or new technology becomes available. The file can also be used to store other information such as newsletters and bulletins, as well as the manual itself, so that it becomes a ready reference for SSA material.

The bound form costs E50 per copy for Swaziland growers, R150 for growers from other SADC member states, and US\$20 elsewhere. The file form is for sale to Swaziland growers only, at a cost of E70.

Copies can be purchased from SSA offices at Mbabane, Big Bend and Simunye or from Swaziland Cane Growers Association offices in Mbabane. Telephone 383 8998 (SSA Simunye) or 40 43561 (Cane Growers) in the first instance.

NEW SEEDCANE PRICE

The basic price of primary seedcane from the Highveld Seedcane Scheme (HVSCS) in Malkerns has been increased by 11% from E285.60 to E317.20 per ton, with effect from 1st July 2001.

Growers are reminded that only certified primary seedcane from the Highveld Seedcane Scheme can be used to establish secondary nurseries on their farms. Nurseries must be registered and once certified are the only legal sources of secondary seed for commercial planting. Inquiries about ordering primary seedcane should be directed to Jabulani Sifundza at SSA Technical Services (telephone 383 8998).

RSSC/MSCo MERGER

The long-awaited merger between Simunye and Mhlume sugar estates was finalised in November.

Tom Lupton and Mike Boast are joint Managing Directors of the new RSSC group, while Chris Febry is Group Financial Controller.

The merger will result in reduced production costs through co-operation and rationalisation of the factory expansion programmes. Ultimately, RSSC will be in a better position to benefit from the continued expansion of cane production in both the Mbuluzi and Komati catchments.

We wish every success to all involved in the new group.