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The importance of Micronutrients

Page 12: *Although micronutrients are required in very small quantities by the crop, they are nevertheless as important as macronutrients; in fact, plants cannot grow without them. Where micronutrient deficiency exists, there will be significant losses in productivity.*

Also in this issue...

SASRI
Unlocking the potential of sugarcane

Summer Weed Control

Good weed control planning pays dividends by increasing your yields and returns, whereas ineffective weed control wastes time and money and leads to reduced yields. It is therefore in your best interests to plan wisely and reap the benefits of clean, weed-free fields. Weed control tips for the first four months of the year are given below.

January

- Hand-weed large tufted grasses, like panicum (barbi grass) and sorghum. Failure to do this will result in gaps in the cane canopy, contribute more seed to the soil seedbank and promote spreading throughout the field. When being removed from the field, collect in bags to prevent spread of seed from the seedhead. In addition, the unusually high spring rainfall can lead to hand-weeded grasses (and other weeds) re-establishing themselves in wet soil.
- Conduct under-canopy spraying of creeping grasses with glyphosate until shading suppresses growth. Ensure that the spray is directed below the actively growing green cane leaves.
- Spot-spray creeping grass patches in cane with glyphosate and mark these areas for further attention. Spot-spraying these low density infestations prevents expansion and saves money in the long run.
- Identify alien plants and stop their spread, especially along valley bottoms, in water courses, and in areas with indigenous vegetation.

February / March

- Draw up a programme plan to include weed control operations for the coming season according to your harvest schedule.
- Mow verges and breaks. Apply mechanical mowing or chemical mowing with paraquat + diuron alongside short cane, and glyphosate or imazapyr alongside tall cane. Direct the spray and avoid drift onto the crop.
- Continue spot-spray applications of creeping grass patches in cane.

April

- Plant green manure winter crops e.g. winter oats in replant fields that were previously treated with glyphosate. Do not plant oats or any other green manure in fields previously treated with Arsenal® GEN 2.
- Contact your local Extension Specialist for more information or refer to your SASRI Herbicide Guide.

Peta Campbell *(Senior Agronomist: Weed Control)*

Message from the DIRECTOR

Dr Carolyn Baker

For most of us it is always exciting to begin a new year, and make plans for the months ahead – and not just those good resolutions that we made as we welcomed in 2013 - but the sort of plans that we make for improving our operations and productivity. Fundamental to any farming business is the importance of good planning – that takes into account the past and sets targets for the future. During the course of 2013 we anticipate that farming conditions will remain challenging for the sugar industry and SASRI's new Programme of Work will once again focus on those issues that are uppermost in growers' minds. Since our Programme has been developed in response to industry needs as presented by the industry-wide Research Development and Extension Committees and also some of the strategic challenges facing the industry, we are confident that we will provide the technology and advice that you require.

Amongst others, a new project that focuses on understanding the extent to which soil health contributes to sustainability will be tackled and will examine the impact of soils on rooting systems and the contribution that poor root development makes to yield in many areas in the industry. In this edition of The Link the importance of micronutrients is highlighted – and in the absence of healthy root systems successful uptake of such essential elements is severely compromised. Following the identification of the new African Sugarcane Rust last year, another new project will be examining its impact on yield and progressing methods of controlling the disease. In view of the devastating impact of pests and diseases when unchecked, the ability to accurately assess and determine the extent and levels of infections in the industry is essential to enable control. For this reason the methods and accuracy of existing assessment methods have been examined and guidelines for surveys will be implemented in all pest and disease operations by the LPD&VCCs.

One of SASRI's key challenges is to successfully achieve take-up of new technologies. It is undoubted that one of the best ways of ensuring this, is through the provision of opportunities for seeing the positive impact of such technologies and practices on your bottom line, and the grower days that are held throughout the year offer significant value in demonstrating our BMPs. Another avenue for enabling adoption is through enhancing the understanding of technology through audio visual materials. In the forthcoming season, SASRI will be focusing on producing audio CDs to complement the existing DVDs to enhance our technology transfer efforts.

So, as you consider your programmes for the forthcoming season, I encourage you to delve into the wealth of information that SASRI makes available to you either through your Extension Specialist, the InfoPack CD or from SASRI's scientific outcomes directly .... and see for yourself how you can target improved production on your farm in 2013.

Topical T

Pest and disease control

- Inspect and rogue fields and nurseries for diseases and off-types. Diseased stools must be completely removed with all their roots. In the case of smut, place the diseased material in a bag, remove from the field and burn. Train your staff to identify smut before the whips emerge.
- Ratoon stunting disease (RSD) can cause severe yield loss. Between 12 and 50% reduction in yield has been recorded in trials. If your fields are infected, it may be wise to sacrifice some crop growth by fallowing these fields until all traces of the previous crop are removed. This could take up to six months. Plan to sample all fields to be re-established this year.
- Do your own surveys or get your Local Pest Disease and Variety Control Committee to check carry-over fields for eldana so that fields with the highest levels of damage can be harvested first in the coming season.
- Keep your eyes open for any unusual pest or disease symptoms; remember you are the first line of defence. Notify your local Extension Specialist or P&D Officer if you find something you do not recognise.

Weed control

- With all the good spring and summer rains, weeds will have had plenty of opportunity to explode during the off-crop period; maintaining your weed control programme will be vital.
- Follow-up hand weeding of Panicum (Ubabe) and Sorghum (Uqhangabothi) and conduct under canopy spraying of creeping grasses.
- Mow verges and breaks.

Planting

- Planting in late summer and autumn brings additional risks. High soil temperatures as well as the possibility of the soil drying out as winter approaches, leads to the risk of soil borne disease such as pineapple sett rot which affects germination. Apply a fungicide to protect the setts, and adequately cover and compact the soil over the setts.
- For the Midlands, plant seed nurseries so that cane is at optimum age in spring the following year for planting.

Tips

January - April 2013

Nutrition

- With the very good rains in spring, well above the LTM for most areas in the industry, there is a good chance that leaching of fertiliser has taken place, so keep an eye on your N levels, you may need a top-up before going into winter.
- Carry out leaf sampling in young ratoon or plant fields not affected by thrips. Leaf samples should be taken to assess the effectiveness of your fertiliser programme. The period for leaf sampling ends in March for the coastal and midlands areas and April for the northern irrigated areas.
- Consider planting green manure crops such as winter oats in your replant fields.
- Carry out soil sampling, top and subsoil, in your plough-out fields, after harvest.

Chemical ripening

- Plan and finalise the chemical ripener programme.
- In the northern irrigated areas there are excellent opportunities to exploit the use of chemical ripeners, as well as the scheduling of varieties to be harvested in their appropriate 'window' to ensure the maximum possible income from every field.
- Monitor the ripener programme.

Harvesting

- Plan the harvesting programme for the coming season.
- Access the latest SASRI crop forecast for the coming season. There is also a yield benchmarking facility available on the SASRI website: http://www.sugar.org.za/ and click on Crop Resources on the left hand side of the screen.
- Estimate the crop for the coming season and submit your estimate timeously.

Land use planning

- Review the field layout in all your plough out fields, including contour banks and waterways.
- Speak to your local SASRI Extension Specialist about the possibility of having a land use plan drafted using the latest computer technology.
- Maintain and repair farm roads.

Irrigation

- Plan a drying-off programme for irrigated fields.
- Schedule irrigation, do not over irrigate.

Management

- Plan all field operations for the coming season to help with determining income and expenditure estimates (budget) as well as identifying the times at which resources such as labour, fertiliser, herbicide and seedcane is likely to be required. SASRI has programme planning charts available should you require them.
- Analyse individual field performance to assist in replant decisions such as variety selection, seedcane requirements and appropriate green manure crops.
- Plan and order seedcane requirements for next year.
- You can only manage effectively if you have good accurate information at your disposal. If you are not using a field record system, think seriously about buying a suitable package. There are many available for use with a personal computer, however even basic manual records are good enough provided the correct data is recorded.
- This period during the off-season provides an opportunity to train staff without much disruption to important operations. Courses that should be considered are: disease, pest and variety identification, planting, Junior or Senior Supervisor training, tractor care, basic workshop skills and welding. Contact the Shukela Training Centre on 031 – 508 7706 or your local extension office.
- An ideal time to carry out the SUSFARMS® Progress Tracker self-assessment would be during the off-crop. This management tool will help with planning the next season's operations.

Contact your local SASRI Extension Specialist should you require help with any of the above.

The SASRI Extension Team

Good Stewardship of Agrochemicals

Responsible stewardship of agrochemicals is important. This article highlights the correct use of some herbicide products which are perceived as problematic in the industry.

Paraquat

Paraquat is included in 50% of the registered pre-early post-emergence treatments listed in Table 4 of the SASRI Herbicide Guide. Be aware that some paraquat formulations are a red band product (Group 1b) as classified by the Department of Agriculture, Forestry and Fisheries. Others, like Gramoxone®, have an emetic (causes vomiting) included in the formulation as a safety feature, with a yellow band (Group II) classification. These bands are seen on the product bottles and drums sold at the suppliers.

Another important consideration is that paraquat binds strongly to particles in dirty water. Make sure that spray tanks are cleaned and purged regularly to avoid dirt accumulation, or spraying will be less effective, especially when water comes from the bottom of the spray tank. Always choose a water source that is clean and clear (free of dirt, grit and organic matter) to avoid binding with paraquat and other herbicides.

Glyphosate

There are sometimes reports of glyphosate not performing well for cane stool eradication and/or for creeping grass control. It is therefore important to select a formulation that is registered for use in sugarcane, and that has proved itself over a number of years in your particular growing conditions. Like paraquat, glyphosate binds strongly to particulates in water, so make sure that spray tanks are cleaned and purged regularly to avoid dirt accumulation. In addition, spraying glyphosate on "dusty/dirty" weeds adjacent or nearby gravel roads is ineffective. Rather spray after rains have washed the dust off target weeds. Dust stirred up during spraying operations may also result in reduced control, especially directly behind the sprayer.

Glyphosate is also very sensitive to salts in spray water (Ca, Mg, Na and K cations). Treating spray water with high grade ammonium sulphate will overcome this problem and ensure better results. Calibration is vital to ensure that the correct dosages are applied to weeds. For tractor mounted spray systems, it is wise to check the nozzles on a daily basis to ensure that there have been no accidental in-field adjustments.

Remember the basics when using glyphosate:

- Select a generic that has proved itself in your area.
- Check that spray water is low in salts, or else treat water with high grade ammonium sulphate. Glyphosate efficiency decreases with increasing salt content.
- Clean equipment thoroughly – dirt reduces glyphosate efficiency.
- Add a surfactant to enhance glyphosate performance.
- Ensure calibration is correct. If the spray operators walk faster than the calibrated speed, coverage will be poor and glyphosate application will be too low. For tractor mounted spray systems, it is wise to check the nozzles on a daily basis to ensure that there have been no accidental in-field adjustments.
- For creeping grasses, one application of glyphosate is not enough. Ensure that there is a long fallow. This allows the opportunity to do multiple glyphosate spotsprays for late emerging runners. However, repeated applications of glyphosate could, in the long-term lead to an increased risk of cynodon and other creeping grasses developing herbicide resistance. To avoid this, rotate glyphosate applications with paraquat + diuron and Fusilade Forte for cynodon control.

Hexazinone

The question is often asked whether hexazinone can accumulate in soil and harm the cane crop. Although hexazinone is highly soluble, it is residual and might accumulate in fields that e.g. have an impermeable layer in the soil profile. Common mistakes when using hexazinone products include: application in plant cane fields and not following product label use restrictions with regard to soil clay content and whether application is during early-, mid- or late-season. Similarly, in some soils, applying hexazinone twice in one season might increase the risk of accumulation. To minimise the risk of possible accumulation of hexazinone, with potential consequences of harming the cane, growers must follow product label instructions.

Arsenal® GEN 2

Arsenal® GEN 2 is now registered for use in fallow fields due for replanting. As this product is residual, it has proven in SASRI trials to have superior control of cynodon when compared with glyphosate. This is because it successfully controls late-emerging rhizomes (underground stems). Use restrictions on the label require a waiting period between application and planting a new cane crop. It is also vital to correct acidic soils with lime. (Refer to the box below). As with a number of sugarcane herbicides, it is important to prevent surface run-off to the rooting zone of indigenous trees and orchards.

Some points from the Arsenal® GEN 2 product label:

1) Cynodon control

The effectiveness of Arsenal® GEN 2 to control cynodon is due to its residual activity.

Effective control is reduced by the following:

- Spraying stressed plants.
- Presence of clods on the soil surface before Arsenal® GEN 2 application e.g. after ripping.
- Soil disturbance after application.
- Frequent and/or heavy rainfall incidences, especially on sandy soils.

2) Follow up-applications:

Do not apply Arsenal® GEN 2 more than once in a normal replant cycle. Any surviving or "missed" cynodon patches should be managed with spot treatment(s) of glyphosate at the registered rate (refer to the applicable product label).

3) Waiting period prior to replanting sugarcane:

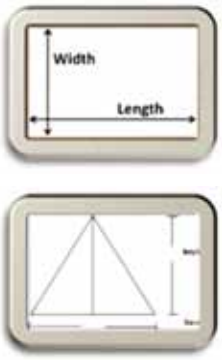
After the application of Arsenal® GEN 2, sugarcane can ONLY be replanted after a minimum waiting period of at least 4 months AND after the occurrence of at least 600 mm precipitation (preferably rain) during the warmer months of the year.

4) Persistence:

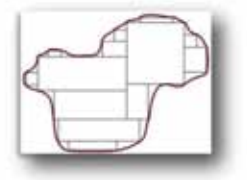
- Arsenal® GEN 2 is broken down by naturally occurring soil micro-organisms.
- The rate of breakdown of Arsenal® GEN 2 in the soil increases as the soil pH increases.
- Persistence is greater on low pH (acid) soils (pH less than 6.0).
- Alteration of soil pH through liming can result in an additional release of Arsenal® GEN 2 from clay particles. This will temporarily increase the available concentration in the soil until breakdown by soil micro-organisms occurs. Planting too soon after liming may therefore result in damage to the newly planted crop. Allow at least 12 weeks between liming and replant. A test planting with single-eye setts is always advisable.
- Once the sugarcane is planted, normal irrigation will accelerate the breakdown of the remaining residues.
- Initial leaf scorch may be observed on young sugarcane, under certain stress conditions (e.g. drought periods) and with certain varieties that may be more sensitive than others to Arsenal® GEN 2. The crop should outgrow this over time with no effect on yield.

Peta Campbell *(Senior Agronomist: Weed Control)*

Accurate field measurements

Method	Description
Tape and Wheel  	• Two of the most conventional instruments for measuring length and distance. • They do not automatically measure area. • Area is calculated using measured distances and equations, if the field/shape in question is a regular shape like a square, rectangle, circle or triangle.  
GPS (Global Positioning Systems) 	• A GPS is a device that uses a constellation of up to 24 well-spaced satellites that orbit the earth, to calculate a position on the ground as coordinates (latitude and longitude). • It can measure accurate distances and areas while in the field. • Different brands have different accuracies associated with them. • It is always useful if GPS measurements can be incorporated into a GIS system.
GIS maps 	• These maps are usually generated from GPS data, orthophotos or high resolution satellite images using GIS software.

Farming practices such as the application of fertilisers or lime and yield estimates are dependent on a farmer's ability to obtain accurate estimates of their farm size. Accurate field measurements are therefore critical for billing purposes when growers contract work out to service providers. It is therefore important to use the correct method to calculate field area. A number of instruments can be used to calculate field area. These include a measuring tape, surveyor's wheel, global positioning system (GPS) or computer software known as a Geographic Information System (GIS). A description of each method, as well as the advantages and disadvantages of each method are given in the table below.

Advantages of the method	Disadvantages of the method
• Flexibility of tape allows for measuring of irregular surfaces and permits one to measure around curves or corners. • Easy to use. • Cheap. • Quick results in any weather conditions. • Does not require specialist skills.	• Calculations for areas with irregular shapes derived from the measured distances will not necessarily be accurate since the equations used will normally be for regular shapes. • If the shape of the field is irregular, then one will have to divide the fields into smaller regular shapes to apply the equations. • These methods measure surface area, therefore, when a field is ploughed, one might obtain inflated distances values which will affect the area calculation.  
• Can measure area for any shape without having to apply complicated equations. • Effective in calculating large areas. • Measures flat and sloping land. • Fairly quick. • Results have been proven to be very accurate (when using GPS brands that are scientifically designed for data collection). • Light to carry. • Measurements can be incorporated into a geographical information system.	• May not receive satellite signal on cloudy days. • May require training to use. • More expensive than the wheel and tape. • May require post-processing using another software to improve accuracy associated with measurements.
• If data and a GIS package are available, the software automatically applies equations to calculate area. • Not much work is involved. • The collected data can be used with other data sets in the GIS environment. This method is as accurate as the GPS method but less laborious since the measurements are done using GIS software and not in the field.	• Requires training. • More expensive than the wheel and tape.

Ingrid Mthembu
(GIS & Remote Sensing Specialist)

Silicon-media
resistance to e

ated ldana

Numerous SASRI trials have shown beyond doubt that root-applied sources of silicon (Si) can substantially enhance eldana resistance of sugarcane grown in low-Si soils. The effect of Si in reducing eldana infestation depends strongly on variety, with susceptible varieties benefitting the most, especially under conditions of moisture stress. Treatment with Si can enhance the resistance of susceptible varieties to a level close to that of well-known resistant varieties such as N21 and N33. However, choosing resistant varieties still remains the first line of defence against eldana; planting susceptible varieties in rainfed areas prone to high eldana infestations should be avoided.

High nitrogen levels encourage eldana survival and stalk damage. Where there is a risk of eldana damage, growers have been advised to reduce FAS nitrogen recommendations by as much as 30% (depending on the N mineralisation potential of the soil). There is obviously a yield penalty associated with this reduced N application. However, silicon nutrition in low-Si soils can also help to diminish the effects of nitrogen (N) on eldana survival and stalk damage. This means that with the simultaneous treatment of the crop with Si, growers can apply the appropriate rates of N and benefit from the increased yields.

Silicon deposited in the outermost layer of the stalk significantly increases the time taken by eldana larvae to bore into the stalk. This therefore increases their exposure to predators, especially ants, and other environmental factors that reduce their survival.

SASRI is currently testing a range of new Si-containing products to identify those that maximise the uptake of Si by sugarcane. It is essential that as much Si as possible remains in a soluble, plant-available form once it is released from the applied Si source and that release is gradual to maximise the residual effects of the application for ratoon crops.

Malcolm Keeping *(Senior Entomologist),*
Neil Miles *(Senior Soil Scientist)* **& Stuart Rutherford**
(Senior Pathologist & Crop Protection Programme Manager)

MICRONUTRIENTS
of macro importance!

Micronutrients and crop growth

Micronutrients are required in minute concentrations in the crop relative to macronutrients such as nitrogen and potassium. For example, a high-yielding crop may remove about 200 kg/ha of potassium, yet only 0.3 to 0.4 kg/ha of zinc and 0.09 kg/ha of copper. Nevertheless, micronutrients are of no less importance than the macros – plants cannot grow in their absence, and crops grown in micronutrient-deficient soils may exhibit similar losses in productivity to those grown in macronutrient deficient soils. In this article, brief consideration is given to the micronutrients zinc (Zn), copper (Cu), iron (Fe), manganese (Mn), boron (B) and molybdenum (Mo).

Soil conditions and micronutrient deficiencies

There are important differences between the micronutrients in terms of the soil factors governing their availability to plants. The 'metal' micronutrients, zinc, copper, iron and manganese become less available to plants as soil pH increases (Figure 1). However, deficiencies of these micronutrients may also occur at lower pH values due to soils being naturally deficient in these nutrients, or reserves being depleted by long-term cropping.

Zinc deficiency is without doubt the most widespread micronutrient problem in the industry. Deficiencies of zinc are often severe in sandy soils and in the inherently acidic soils of the Midlands and Eshowe areas, as well as in the high pH soils of the irrigated areas. In addition, high levels of phosphorus in the soil can induce zinc deficiencies in the crop.

Copper supplies are often marginal or deficient in sandy coastal soils, and in soils with high organic matter levels. Importantly, the sharp decrease in the availability of zinc, copper, iron and manganese with increasing pH implies a need for the judicious use of lime on industry soils.

Lime applications in excess of crop requirements, such as those typically emanating from 'Albrecht' based recommendations, frequently induce deficiencies of the metal micronutrients. Furthermore, uneven spreading of lime

may result in localised areas with elevated pH, and thereby micronutrient problems. Highly visible evidence of this is the widespread and patchy "ratoon chlorosis" on the KZN north coast, reflecting the iron deficiency resulting from the uneven application of large quantities of high-pH filterpress over the years (Figure 2).

Boron deficiencies are most likely on sandy soils, where this nutrient may be lost by leaching. In addition, boron availability decreases with increasing soil pH, especially at pH's greater than 6.5. As in the case of the metal micronutrients, therefore, 'overliming' may induce boron deficiencies.

Molybdenum reserves in most soils are adequate for crop growth. However, under acid conditions the availability of molybdenum to plants decreases markedly (Figure 1). Liming to alleviate aluminium toxicity usually increases plant-available molybdenum levels in soils sufficiently to overcome deficiencies.

Diagnosis of deficiencies

An assessment of available micronutrient supplies for crop growth should involve the use of both soil and leaf analyses. FAS's analysis packages routinely include zinc, copper, manganese and iron in both soil and leaf samples, and it is envisaged that boron analysis in leaves will become available in the future.

Correction of deficiencies

As noted earlier, crop requirements for micronutrients are orders of magnitude lower than for macronutrients. Furthermore, with the range between sufficiency and toxicity for several of the micronutrients – in particular boron and copper – being extremely narrow (Figure 3), caution is required in their use. Over-application of these micronutrients is easy.

Typical rates for soil applications are listed in Table 1. With the exception of iron, single applications at the rates indicated in the table are usually sufficient for three or more years. In the

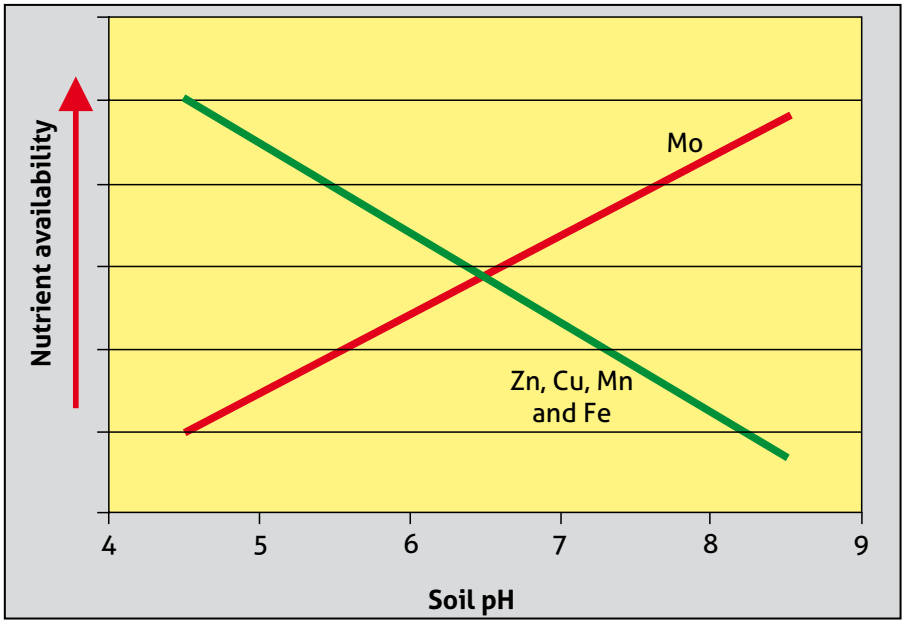


Figure 1: Impact of soil pH on micronutrient availability for crop uptake.

case of iron, soil applications of iron sulphate are largely ineffective, and foliar fertilisation with this product is therefore preferable. Several foliar dressings may be required for a crop if the deficiency is severe. More effective iron fertilisers, such as FeEDDHA, may be applied to the foliage or the soil; however, high cost usually limits their use.

Crop zinc requirements may be addressed through the use of NPK fertilisers containing added zinc. However, a higher concentration than the usual 0.5% zinc generally contained in these products is often necessary to effectively correct deficiencies. Blends with higher zinc concentrations are usually available on request; alternatively, direct applications of zinc fertiliser may be necessary.

Importantly, organic materials such as manures, filtercake and flyash generally contain appreciable reserves of the whole spectrum of micronutrients. Systematic application of such products to fields will go a long way towards ensuring a favourable supply of these nutrients for the crop.

Neil Miles *(Senior Soil Scientist)*

Figure 2: Iron deficiency ('ratoon chlorosis') in localised high pH areas in a field on the North Coast.

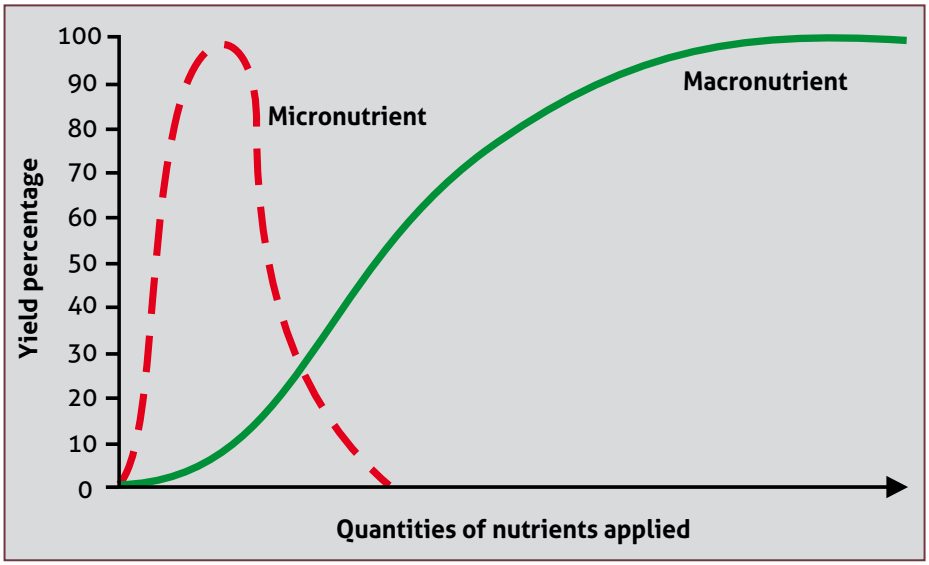


Figure 3: Hypothetical yield curves reflecting the differences in crop requirements for micro and macronutrients. Note the sharp yield depression which is possible as a result of excessive applications of a micronutrient.

Table 1: Suggested micronutrient application rates. With the exception of iron, the indicated rates apply to soil incorporation for plant crops. On soils with less than 15% clay, as well as in the case of ratoon fertilisation, rates should be reduced by 25 to 50%.

Micronutrient	Elemental Rate kg/ha	Source*	Source rate kg/ha
Zn	10	Zinc sulphate (heptahydrate: 22% Zn)	45
Cu	5	Copper sulphate pentahydrate (25% Cu)	20
Mn	20	Manganese sulphate (27% Mn)	74
B	0.5	Solubor (20% B)	2.5
Mo	0.2	Na-molybdate (39% Mo)	0.51
Fe (foliar)	-	Ferrous sulphate	1 to 2% solution (in 300 to 400 L water/ha) anytime from 5 to 6 leaf stage (may need to be repeated)

** Note that this is not a comprehensive list of all the products available on the market.*

Training staff using SASRI resources

The off-crop is an opportune time to focus some attention on training and informing staff. Apart from formal courses offered by both SASRI and the Shukela Training Centre, a number of training resources can be used. SASRI has a number of training videos. One of our latest videos is the application of fertiliser using a knapsack (available in English and *isi*Zulu), as well as the application of fertiliser using the tin and string method. Other videos include:

- Soil and leaf sampling – demonstrating correct procedures for leaf, surface and subsurface soil sampling;
- Loading guidelines for grab-loaders – produced in *isi*Zulu with English subtitles, providing practical tips on how to improve loading techniques of whole-stick cane using a grab-loader;
- Planting – available in English and *isi*Zulu; and
- Harvesting – demonstrating correct base cutting and topping heights.

The newly released Info Pack 2012 CD is a comprehensive collection of SASRI publications including The Link, Ingede, Information Sheets and various technical manuals (eldana, diseases, weeds, soils, seedcane, green manuring), and some training videos. In addition, the CD contains a series of grower poster sets suitable for small-scale growers and farm staff.

The lists of posters are given in the table on the right, with the number of posters in each set shown in brackets.

Should you require printed versions of any SASRI publications for your training needs please contact the SASRI library on (031) 508 7514 or email: library@sugar.org.za .

Name of set	
Alien Plants (9)	Pests (6)
Cane Quality - including RV (6)	Planting (6)
Diseases of Sugarcane (6)	Relative Payment (2)
Fertiliser (6)	The Environment (10)
Harvesting (10)	The Sugar Industry (13)
Irrigation (6)	Weed Control in Sugarcane (6)

Other posters:

Biosecurity Alert - Chilo (English, Afrikaans, Siswati, Portuguese)
Biosecurity Alert - Rust
Biosecurity Alert - Parthenium
Micronutrient deficiency in sugarcane
Nutrient deficiency in sugarcane
SASRI Programme Planner
SASRI's recommendations for Eldana control

Chemiese rypmaking

maak betekenisvolle bydrae tot RV opbrengste in Pongola

Deur **Riekert van Heerden** *(Suikerriet-fisioloog) &* **Marius Adendorff** *(Voorligtingspesialis)*

Pongola kwekers begin al hoe meer die ekonomiese dividende pluk wat onder kommersiële toestande uit chemiese rypmakers verkry kan word. Ter verdere stawing hiervan is die kommersiële strookproef wat gedurende 2011 op die plaas van Ernst Höll (SM Naude Boerdery) uitgevoer is gedurende 2012 herhaal. Die eerste strookproef het aangetoon dat die rypgemaakte stroke riet 3.1 ton RV/ha meer gelewer het as die onbespuite riet, terwyl die verhoogde sapsuiwerheid wat terselfdertyd behaal is, ook die maaleienskappe van die riet verbeter het (verwys na The Link, September 2011 uitgawe vir verdere besonderhede). Die doel van die tweede strookproef was om die resultate van die eerste proef in dieselfde lande te bevestig en om verder die prestasie van die standaard Fusilade Forte toediening met 'n kombinasie (Ethephon + Fusilade Forte) toediening te vergelyk.

Soos gedurende 2011 is opbrengsparameters in behandelde asook onbespuite stroke riet (3 ha per strook) binne drie aaneenlopende lande (N43 eerste ratoen) met mekaar vergelyk. Lugtoediening van Ethephon het op 14 Februarie 2012 plaasgevind en Fusilade Forte 5 weke later op 21 Maart 2012. Slegs 'n matige graad van afdroging is deur Ernst vanaf 2 – 3 weke voor oes toegepas. Die drie lande is gedurende die tweede helfte van Mei 2012 geoes, met 'n Fusilade Forte toediening-tot-oes periode wat gewissel het tussen 8 en 10 weke. Tydens oes is al die rietvragte afkomstig van die rypgemaakte- en onbespuite stroke getoets vir kwaliteit (RV%) en geweeg sodat riet- en RV-opbrengste (t/ha) bereken kon word.

Stronk-kwaliteit

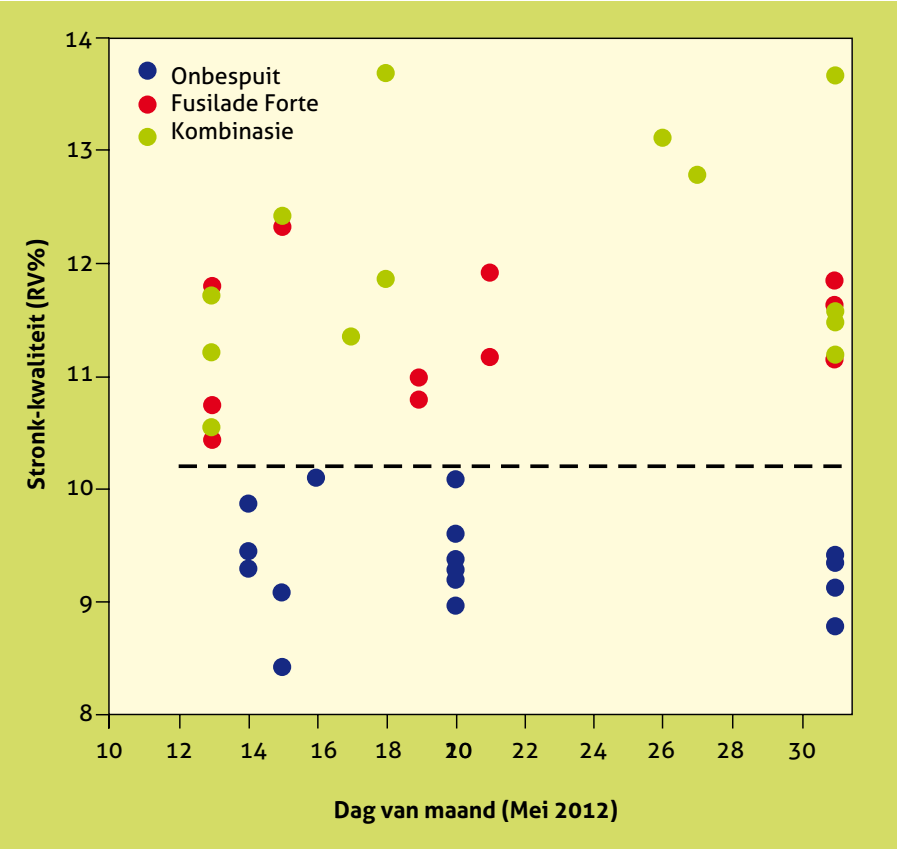
In Figuur 1 word die stronk-kwaliteit van die individuele rietvragte wat by die Pongola suikermeul afgelewer is aangetoon. Al die rietvragte afkomstig van die rypgemaakte stroke het 'n aansienlik hoër RV% behaal as riet afkomstig van die onbespuite strook (blou sirkels). Die konsekwente onderskeid in stronk-kwaliteit, wat vir minstens 10 weke na Fusilade Forte toegediening steeds behoue gebly het, word met behulp van

die horisontale stippellyn geïllustreer. Ofskoon enkele van die rietvragte afkomstig van die kombinasiebehandeling die beste RV% behaal het (groen sirkels), was daar geen duidelike onderskeid ten opsigte van die standaard Fusilade Forte behandeling (rooi sirkels) nie.

Stronk- en RV-opbrengs

In Tabel 1 word die opbrengste wat in die onbespuite en rypgemaakte stroke behaal is opgesom. Die Fusilade Forte- en kombinasiebehandeling het onderskeidelike inboet van stronk-opbrengs van gemiddeld 1 en 7 ton/ha teweeggebring. Die verhoging in stronk-kwaliteit (RV%) het egter dubbel en dwars vergoed vir hierdie geringe verlies in stronk-opbrengs. Derhalwe was gemiddelde RV-opbrengs in die standaard Fusilade Forte behandeling 2.1 ton/ha hoër as in die onbespuite riet. Die groter verlies in stronk-opbrengs in die kombinasiebehandeling het egter die hoër gemiddelde RV% in hierdie behandeling uitgekanselleer sodat dieselfde RV-opbrengs verbetering as in die standaard Fusilade Forte behandeling behaal is. Hierdie bevinding strook met huidige aanbeveling deur SASRI, naamlik dat N43 nie positief op die kombinasiebehandeling reageer nie. Die effens laer stronk-opbrengs en hoër RV% wat in die kombinasiebehandeling behaal is, mag egter voordelig wees vir kwekers wat vêr van die Pongola meul geleë is.

Voor aftrekking van totale produk- en toedieningskostes was die wins wat behaal is deur middel van chemiese rypmaking R6 510/ha in beide behandelings (gebaseer op RV prys van R3 100/ton).



Figuur 1. Stronk-kwaliteit (RV%) van individuele rietvragte.

Die wins kon selfs hoër gewees het as die groei van die riet in hierdie lande nie a.g.v. 'n erge haelstorm vroeër die seisoen belemmer is nie. Stronk-opbrengs was ongeveer 26 ton/ha laer gewees as gedurende 2011.

Die resultate van beide strookproewe toon aan dat RV-opbrengs onder kommersiële toestande met tussen 2.1 – 3.1 ton/ha verhoog kan word met chemiese rypmakers, en dat hierdie praktyk baie winsgewend is vir gebruik in Pongola op riet wat goed bestuur is en 'n hoë opbrengspotensiaal het.

Bogenoemde stelling word verder versterk deur positiewe kommentaar oor die gebruik van chemiese rypmakers wat onlangs van bekende rietkwekers in Pongola ontvang is:

"Ek het chemiese rypmakers vir baie jare intensief in Swaziland benut en is oortuig van die voordele van hierdie gevestigde bestuurspraktyk. In Pongola is die maalseisoen besonder lank, van vroeg-Maart tot laat-Desember. As gevolg hiervan is chemiese rypmakers, veral vir die Pongola kwekers, van besonderse groot voordeel. Met behulp van twee baie suksesvolle kommersiële strookproewe die afgelope twee seisoene, asook gereelde terugvoer vanaf SASRI betreffende navorsingsresultate op die proefplaas, is Pongola kwekers van konkrete bewyse

Tabel 1: Stronk- en RV-opbrengs.

Behandeling	Suiwerheid (%)	RV (%)	Stronk- opbrengs (t/ha)	RV- opbrengs (t/ha)	Verbetering in RV-opbrengs (t/ha)
Onbespuit	79.4	9.3	106	9.8	-
Fusilade Forte	84.2	11.4	105	11.9	2.1
Kombinasie	85.0	12.0	99	11.9	2.1

rakende die voordele van chemiese rypmaking voorsien. Dit het daartoe bygedra dat die gebruik van chemiese rypmakers deur Pongola kwekers drasties toegeneem het gedurende die afgelope twee seisoene met 'n gepaardgaande aansienlike verbetering in gemiddelde RV% gedurende die huidige seisoen. Die aanvraag vir toediening van chemiese rypmakers het tot so 'n mate toegeneem dat die plasing van 'n permanente vliegtuig in die Pongola area tans oorweeg word. Daar is steeds geringe probleme wat ondervind word soos wisselvallige spuitprogramme en die effektiwiteit van aanwending. Die plasing van 'n permanente vliegtuig in die area sal van hierdie probleme teëwerk." Edmond Rouillard (Ondervoorsitter, Pongola MGR).

"Na aanleiding van die positiewe resultate is ek baie bly dat ons die moeite gedoen het om hierdie strookproef op my plaas te herhaal. Selfs al het ons hewige haelskade op die betrokke area gehad is die RV opbrengs in die rypgemaakte riet steeds noemenswaardig beter as die kontrole strook. Ek beskou die proef van groot waarde vir myself asook vir die bedryf omdat dit bewys dat selfs onder kommersiële omstandighede die resultaat eerstens 'n groot ekonomiese voordeel ingehou het en tweedens dat dit herhaalbaar is. Daar het 'n groot kopskuif in Pongola plaasgevind sover dit die gebruik van rypmakers betref en ek glo dat proewe soos hierdie, asook die positiewe resultate wat behaal is, daartoe bygedra het om dit te bewerkstellig." Ernst Höll (SM Naude Boerdery).

Bedanking: *SASRI wil graag van die geleentheid gebruik maak om Ernst Höll (SM Naude Boerdery) te bedank vir sy entoesiastiese en toegewyde bestuur van hierdie strookproewe waarsonder dieselfde mate van sukses nie behaal sou kon word nie.*

Ernst Höll (links) en Marius Adendorff (regs)

Chemical ripening contributes significantly to RV yields in Pongola

> *"All chemically-ripened cane consignments delivered to the Pongola mill outperformed the non-ripened cane consignments in terms of RV%."*

Farmers in Pongola are increasingly starting to reap the economic benefits from chemical ripening. Results from a commercial strip trial conducted during 2011 on Ernst Höll's farm (SM Naude Boerdery) in Pongola showed that a profit in excess of R8 000/ha can be achieved from the correct application of chemical ripeners. To confirm these findings the strip trial was repeated during 2012 in the same fields of N43. In addition, the standard Fusilade Forte application was compared to the combination (piggy-back) treatment, where both Ethephon and Fusilade Forte were applied. Yield parameters achieved in both the non-ripened and chemically-ripened strips were compared. All chemically-ripened cane consignments delivered to the Pongola mill outperformed the non-ripened cane consignments in terms of RV%. Under the specific conditions of the trial, in which the crop was not dried off severely, the improvement in cane quality was maintained for at least 10 weeks after spraying of Fusilade Forte. The improvement in RV yield due to application of Fusilade Forte and the combination treatment was 2.1 t/ha in both cases. The positive response was due to large improvements in RV% in the presence of only minor cane yield reductions. The combination treatment lost the advantage (higher RV%) over the Fusilade Forte treatment due to the slightly larger reductions (7 t/ha) in cane yield. However, the combination treatment might have benefitted growers far from the mill due to the slightly lower cane tonnage but higher RV%. The results of both strip trials showed that RV yields can be improved by 2.1 – 3.1 tRV/ha under commercial conditions, and confirms that chemical ripening is a highly profitable management practice for use by Pongola growers in high yielding crops.

Does GREEN MANURING make Rands and Sense?

You probably know that breaking the sugarcane monoculture with a green manure crop makes agronomic sense. Green manures combat pests such as nematodes, help to control weeds and liven up soil microbes, amongst many other benefits. The Big Question however is: Does green manuring make economic sense? Can taking land out of sugarcane for a few months, or even a whole season, still bring in as much money as continuous cane? Happily, the answer seems to be 'Yes'.

SA Canegrowers' economists and SASRI researchers recently simulated a virtual north coast cane farm with moderate soils. This virtual farm was tracked over a whole cane cycle – a period of roughly 10-12 years. Three final harvest dates – early, mid and late season – were simulated, and, where appropriate, green manures, weed fallows or no-fallow plough out/replants (PO/RP) were compared.

The initial results from this research (as presented at SASTA and published in the Canegrowers Newsletter in November 2012) seemed to suggest that weed fallows would outperform green manures and PO/RP in most cases. **However,** when the model was updated with figures that more accurately reflect the increased weed control costs associated with weed fallows, and the possible impact of RSD associated with insufficient fallows during PO/RP, a different picture emerged. The updated results show that for almost every scenario – including a long (10 month) fallow - green manures economically outperformed a weed fallow or PO/RP.

What then does this mean? Under the conditions studied, green manures make economic sense. Under most scenarios, green manures not only didn't lose the grower money, but were actually more profitable than the alternatives – straight plough out/replant, or weed fallows. In fact, weed fallows should be avoided altogether where creeping grasses or other problem weeds are present.

When viewed over the entire lifespan of a crop, it is usually more profitable to grow a green manure than to have a weed fallow, or to have no fallow at all. At worst, green manures are not losing growers money, even with a long fallow. It is therefore possible to get all the agronomic benefits of green manuring, without losing sleep over the economics.

This study was conducted for the coastal region. The authors plan to extend the study to other areas of the industry.

Ruth Rhodes *(SASRI Soil Scientist)* **&**
Chris Gillitt *(SA Canegrowers)*

Weather

Review

The 2012 spring rainfall was generally well above the long-term mean for most parts of the Industry (Figure 1). September and October rainfall was the highest in recorded history in these months for Mpumalanga, and for KwaZulu-Natal it was the highest since 1987. Temperatures over the review period were generally below average due to increased cloud cover. The very wet conditions in September and October impacted negatively on harvesting operations, which was compounded by industrial action in the transport sector. This led to a drastic reduction in cane quality and, for some mill areas, an increase in the amount of cane that has to be carried over to 2013. However, the spring rainfall had a positive impact on crop growth and irrigation water supply especially in Pongola. This bodes well for the 2013/14 crop.

Outlook

At this stage the most likely state of ENSO to occur for the remainder of this summer is the neutral phase. The South African Weather Service predicts enhanced chances of above average rainfall for February to April, while the European Center for Medium-Range Weather Forecasts and the International Research Institute for Climate Society both predict near normal rainfall for this period. Temperatures are expected to be below average.

Please visit the SASRI weather web http://portal.sasa.org.za/weatherweb/ for links to up-to-date seasonal climate forecasts and also for the latest rainfall and other weather data.

Phillemon Sithole *(Agrometeorologist)* **& Abraham Singels** *(Principal Agronomist)*

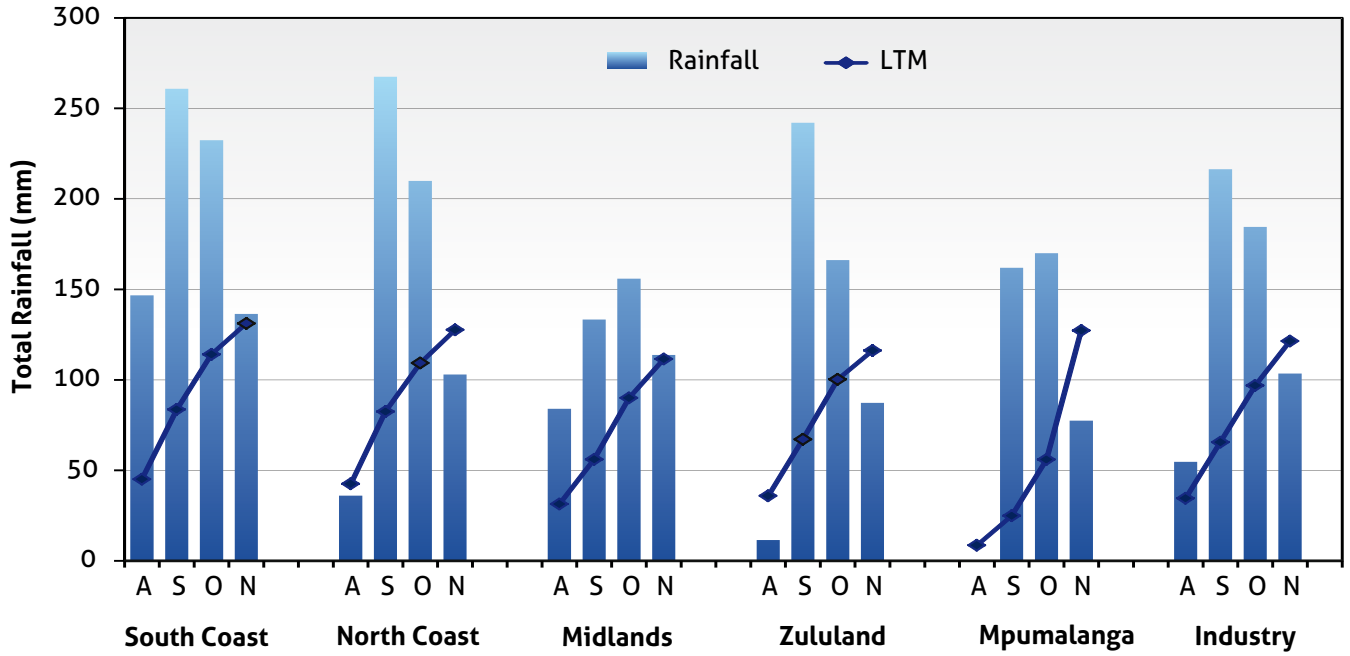


Figure 1: Regional and industry average monthly total rainfall and the monthly long term means (LTM) for August to November 2012.

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