

THE LiNK

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First mobile app for the SA sugar industry!



SASRI has developed and released a mobile application that assists growers with their ripening decision-making in the field. Recommendations are based on readings from measurements of Brix% taken with a hand-held refractometer. PurEst™ can also assist with drying-off and harvesting decisions by estimating stalk moisture% and RV% (page 12).

Also in this issue...

Nuwe FAS Analise

FAS het sopas 'n splinternuwe grondtoets bekend gestel om die hoeveelheid reserwe kalium wat in suikerriet lande beskikbaar is, te toets! Hierdie toets sal op die FAS grond analise verslag beskikbaar wees (bladsy 17).



Orange Rust

Growers are advised to scout fields for Orange Rust after the recent discovery of spores in a spore trap located on the SASRI Research Station at Komatipoort (page 10).



Varieties

SASRI scientists explore the mistaken belief that older varieties are more resistant to diseases when compared to newer releases (page 3).



Unlocking the potential of sugarcane



Message from the Director

 Dr Carolyn Baker

SASRI has developed and built its own NovaCane® facility at Mount Edgecombe for producing tissue culture plants specifically for the plant breeding programme. This is not a commercial facility: with a capacity of producing around 250 000 plants, it will provide all the source material for the bulking plots in the industry. This will enable seedcane distribution of new varieties in all regions at the time of release of a new variety. It is expected that operations in the facility will commence in late September in order to provide the requisite number of plants of the new pre-release varieties for bulking in the New Year.

In view of the historic lag in distributing new varieties to both northern and southern regions of the industry at the same time, production of NovaCane® plants was identified as a way of mitigating this problem (since plants would be both disease free and available in sufficient quantity to supply all areas simultaneously). In the conventional breeding programme, the relatively restricted amount of seedcane that enters into the bulking phase influences the volume of material that emerges from the programme. The NovaCane® process however, enables rapid multiplication of plants thereby providing a solution to this problem. Further, distribution of NovaCane® plants from their source at Mount Edgecombe to all regions in the industry will overcome the potential biosecurity risks of transporting seedcane across the cordon sanitaire since all tissue cultured plants are disease free.

This fresh approach to distributing source material of the new varieties is one of the ways that SASRI hopes to enhance adoption of new varieties. Through early exposure to new varieties in the regions and also the opportunity to evaluate them where they will be grown, it is hoped that growers will more readily recognise their value and adopt them more quickly. Since development and delivery of new varieties to the industry is arguably the most important of SASRI's key performance areas, looking for ways to enhance their adoption is critical. Further, since each new variety represents a collection of desirable traits, that collectively demonstrate improvement over previously released varieties, it is important that we enable growers to have every opportunity to assess them and decide whether or not they should be adopted.

Looking towards the future, that may well encompass production of genetically modified (GM) varieties, rapid adoption of the varieties would be key to maximising a return on investment. Such rapid uptake of new varieties is only possible if increased quantities of seedcane are made available for commercial plantings. Hence the NovaCane® approach that we have adopted in the plant breeding programme will provide valuable learnings should there be a future requirement to increase quantities of bulked up seedcane for distribution.



Growing Stronger: P&D resistance of newer varieties

 Sanesh Ramburan (Variety Scientist) and Sharon McFarlane (Plant Pathologist)

Growers sometimes express concern about the susceptibility of new varieties to diseases. Older varieties such as NCo376 and N12 are still widely used in some areas due to their perceived hardiness and ability to deal with disease.

All varieties released by SASRI are rigorously tested for their reactions to major pest and disease threats in the industry. While routine pest and disease screening was not in place when NCo376 was released in 1955, similar testing procedures that are employed currently for newer varieties were in place before N12's release in 1979. In general, there is a curious perception in the industry that all older varieties are hardier than newer varieties. The reality is that many older varieties have actually failed after succumbing to major pest and disease outbreaks or due to poor performance.

The popular variety NCo310 was degazetted due to its susceptibility to smut but was also susceptible to mosaic and gumming. Other older varieties that were degazetted due to disease susceptibility include: NCo339 (mosaic); N7, N8 and N13 (smut); N15 (leaf scald, pokkah boeng); N34 (pokkah boeng). Variety N55/805, although susceptible to smut, mosaic and gumming, was not degazetted but lost favour after developing severe brown rust during a resurgence of the disease in the mid-1970s. Other examples of older varieties that lost favour include N52/219 and N6 (poor performance), N11 (poor performance, eldana), N18 (poor ratooning, eldana) and N20 which was released for its eldana resistance but was never adopted by growers. Even variety NCo376 is susceptible to smut, mosaic and eldana, and is

therefore not as hardy as some of the more recently released varieties. These examples illustrate how variety longevity has always been curtailed by P&D threats in the industry, and that these issues are not limited to new varieties only.

Variety N12 is actually an exceptional variety that has proven itself to be more tolerant to pests and pathogens than most, and this is one of the reasons for its longevity in the industry. One of its major advantages in the midlands from a disease point of view, is its resistance to brown rust when many other varieties have become infected. However, N12 has an intermediate rating for mosaic and, with it being grown in a mosaic-prone area for so many years, the disease has become prevalent in this variety in the midlands over time, largely through the planting of infected seedcane. Mosaic-free seed sources of N12 are scarce, particularly in the midlands, which could ultimately cause the demise of this variety in the region.

SASRI's breeding programme prioritises pest and disease resistance in new releases, which are all measured relative to standards like N12 and NCo376. Varieties will only be released if they demonstrate improved yields under the prevailing conditions, with superior pest and disease resistance profiles relative to the most important risks in the different regions.

Growers are encouraged to follow the pest and disease resistance guidelines in the variety information sheets and consult Extension on variety pest and disease susceptibility issues in their area. Appropriate management of varieties is essential to ensure their longevity in the industry. The perception that old varieties are "hardier" than new varieties is simply untrue.

Topical Tips

By Rowan Stranack (Extension and Biosecurity Manager)

Eldana

Despite good rains in some parts of the industry eldana remains a serious threat. Ensure all carryover fields for 2017 are carefully selected and have a spray programme if required by LPD&VCC rules. Susceptible or intermediate susceptible varieties must be treated if carried over and you are in a high eldana risk area. Be sure to check with your local Extension Specialist, that your insecticide spray programme is IRAC compliant.

Flowering

Many fields on the coastal belt have flowered profusely this year. Cane that has >20% flowered stalks should not be carried over. Plan to harvest this cane as soon as possible.

Pests and Diseases

With the onset of spring, roguing for smut and mosaic in commercial fields and seedbeds should begin in earnest. A small team of farm staff dedicated to this task will ensure disease is kept at low levels.

Be on the lookout for new rust infections as weather conditions become more favourable. Fungicides are most effective when applied before severe symptom development.

Sandy fields also hold a high risk of nematodes affecting cane growth. Consult your Extension Specialist for advice on testing problem fields and the recommended treatment.

Seedcane

Ensure seedbeds are entirely free of volunteer regrowth before planting. Systemic diseases such as RSD, smut and mosaic, survive in volunteers and will be a source of infection for the new crop.

Soils

With the possibility of good rains in the coming summer every precaution should be taken not to practise conventional tillage on fields prior to planting, especially those on slopes or erodible soils. Chemical minimum tillage is the crop eradication method of choice in the summer. Preserve the soil on your farm. It is a priceless asset.

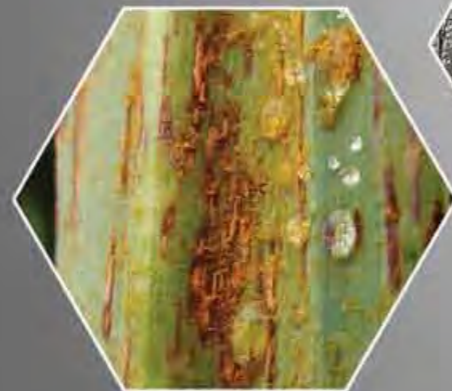


Planning

With harvesting, planting, fertiliser application, insecticide spraying, weed control and many other things all on the go at this time of the year, there is a need for careful tracking and recording of what operations have been carried out. Speak to your Extension Specialist about programme planning and how that can help ensure things are done and at the correct time.

Weed Control

By now, operations to control creeping grasses should have been under way for some time already. Persistence with creeping grasses is a major factor in achieving effective control of these weeds. Regular follow up sprays on grass patches using a glyphosate-based product is essential. Once-off treatments with glyphosate or other 'scorch' chemicals is not sufficient to achieve good control. If contemplating longer term treatments using imazypr-based products, contact your agrochemical agent for specific advice and guidance in the use of these long-residual products.



Planting

Before applying glyphosate to replant fields first make sure there has been adequate growth and all tillers have emerged. This will avoid costly and time-consuming roguing of unwanted cane regrowth.

Fertilisers

Summer is the time for taking leaf samples. Fertiliser is an expensive input and the application of unnecessary nutrients is a waste of money. Use leaf samples to check the effectiveness of your fertiliser applications.

Good summer rains will increase the risk of nitrogen fertiliser losses by leaching. Plan to split apply N, especially on sandy fields.





Soil Health

Neil Miles (Senior Soil Scientist)

Understanding Salt Problems in Soils

In the production of sugarcane in southern and central Africa, soils with 'salt problems' occur mainly in irrigated areas with lower rainfall. Salt problems may restrict yields to half or less of production potential, and where severe, result in the widespread death of plants.

Identifying the different types of salt problems

There is often confusion regarding the nature of soil salt problems and the methods required to correct them. The various types of salt conditions found in soils are shown in Figure 1.

- Soils with **excess salts**, typically calcium (Ca), magnesium (Mg) and sodium (Na), in combination with chlorides, sulphates and bicarbonates, are termed **saline** ('witbrak').
- Where only **sodium** is in excess, the soil is classified as **sodic** ('swartbrak').
- Soils with a combination of a **high salt load**, but with **sodium** predominating over calcium and magnesium, are termed **saline-sodic** ('witbrak').

How do salt problems affect the crop?

Salt-affected soils affect production in different ways (Figure 1). High salt loads (salinity) restrict actual crop growth by making it difficult for roots to extract water in the soil. In saline soils, therefore, it is not unusual for the crop to appear **moisture-stressed**, even though the soil profile is moist. In the case of sodicity on the other hand, the impact on yields is through the excessive levels of sodium. This causes the deterioration of soil physical properties (break-down of structure, poor aeration, compaction, surface crusting, and restricted water movement through the soil). In the case of saline-sodic soils, both the uptake of water from the roots and the structure of the surrounding soil is affected.



Salt problems in soils appear typically as stunted growth in small patches, which expand with successive crops.



Salt load of the soil in the foreground was too high for sugarcane to survive.



Sodic "Swartbrak" soils where sodium salt is dominant, the pH is greater than 8.0 and the soil is in an advanced dispersed condition.

What causes salt problems?

Salt problems often occur naturally in soils in drier climates due to insufficient rainfall to leach out the salts released from the soil parent materials. Under cropping, they typically arise as a result of excessive irrigation with water containing high

salt loads, or excessive sodium. Over-application of manures and fertilisers may contribute to the development of salt problems.

How to correct salt problems

Correction of soil salt problems is usually a costly and lengthy operation, and in cases where drainage is very poor, reclamation may be all but impossible. SASRI Information Sheet 5.11 provides some detail of remedial measures for salt-affected soils. In short, reclamation typically entails the following:

- For saline soils, improved drainage must be provided to promote the leaching out of excess salts. Gypsum is not required.
- For sodic and saline-sodic soils, incorporation of gypsum (typically at 5–10 t/ha) is necessary followed by leaching with excessive but controlled irrigation applications with water of a satisfactory quality in order to induce leaching.

It is worth noting that agricultural limes are not of use in reclaiming soils with salt problems.

Because of the difficulties associated with reclaiming salt-affected soils, every effort should be made to ensure that salt-related problems do not develop in fields. It should also be noted that salt problems may take years to develop to the extent that yields are affected. This underlines the need for the **regular testing of soils and irrigation water**. Importantly, where water is drawn from rivers and streams, samples should be taken during periods of low, medium and high flow, since water quality may vary widely with flow volumes.

Crop nutritional considerations

With respect to crop nutrition, particular attention needs to be directed to the micronutrients zinc, copper, manganese, iron and boron, since the high pH levels in salt-affected soils tend to reduce their availabilities to plants. Deficiency of phosphorus is also a widespread problem in these soils since the abundant supplies of calcium coupled with high pH's result in plant-available phosphorus supplies being converted into insoluble calcium-phosphate compounds. Therefore it is important that phosphorus availability in soils with pH levels of >6.0 is measured with FAS's reliable resin P test, and not with acid soil test extractants.

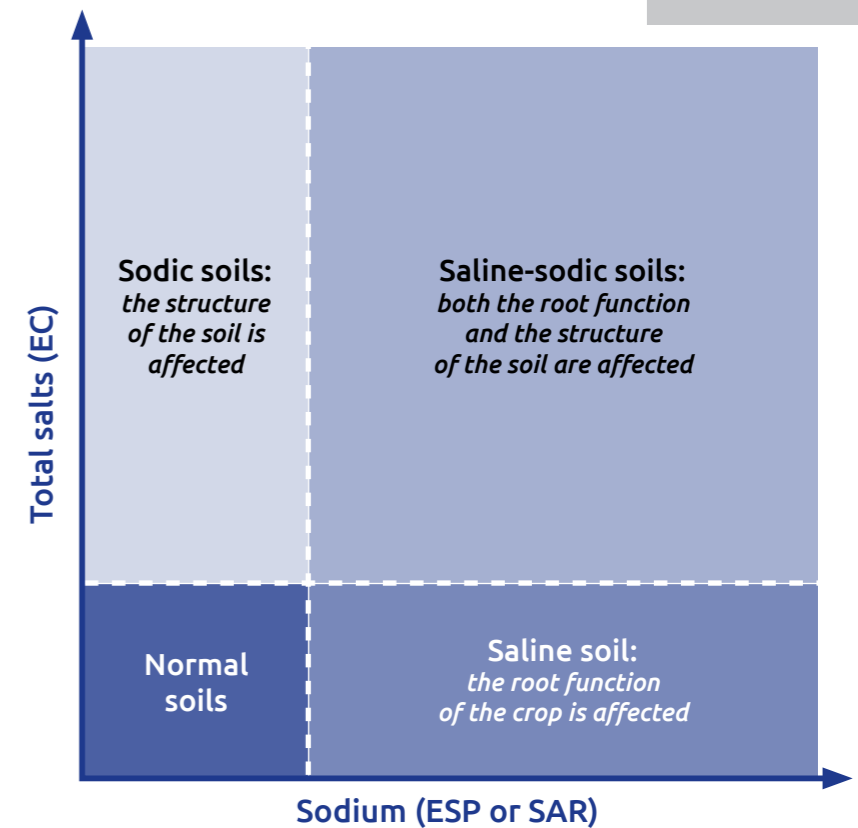


Figure 1: Laboratory-measured parameters used to reflect salt problems (on axes), and indications of the impact of salt conditions on either crop growth or soil properties.

Understanding salinity/sodicity results received from the laboratory



Salt-affected soils generally have pH values of greater than 5.5, and aluminium toxicity is therefore not a problem. Laboratory-measured parameters used to indicate the extent of salt problems are shown on the axes of Figure 1.

- Electrical conductivity (EC) is measured as it reflects the total soluble salt content of the soil. **EC values of >200 mS/m indicate the presence of salt problems.**
- Exchangeable sodium percentage (ESP) and sodium adsorption ratio (SAR) essentially reflect the proportion of sodium relative to calcium and magnesium, and thereby the sodium hazard in the soil. ESP values are routinely reported on all FAS soil fertility reports, while a separate salinity/sodicity analysis is required for the measurement of SAR. Although ESP and SAR are strongly correlated, the ESP is usually 1.6 to 1.9 times the SAR value. **Soils with ESP values of greater than 7 to 10 and SAR values greater than 5 to 6 have excess sodium and are likely to be affected by sodicity.**
- In saline soils pH may vary widely, while **soils affected by sodicity tend to have pH values of >8.0.**



Seeds of Success: A story from the north coast

 Kerisha Raghunandan (Publications Officer)



Dustin Cooper

In any area of agriculture, the first step to yielding a profitable crop is to plant quality seed. Investing in seedcane that is healthy and free from disease is crucial.

Dustin Cooper manages a farm on the north coast which also has a certified seedcane nursery of approximately 14-15 ha. The varieties grown in the nursery are N36, N52, N55, N58, N59, and N60. Dustin has ensured that the chosen sites for these fields have high potential soils and are fertilised with 300 - 400 tons of filterpress prior to planting. Some of these fields have been under supplementary irrigation using boiler water from the Gledhow Mill.

Managing this operation in addition to the entire sugarcane farm is no easy feat as there are many rules which he must adhere to: all certified nurseries must comply with the 12 month fallow period; seedcane must fall within specified pest and disease thresholds; all seedcane must be hot water treated prior to planting in the nursery; as well as adherence to the maximum age at harvest indicated for each region. Once the seedcane has been harvested on Dustin's farm, it is sent to the hot water treatment plant at the Gledhow Mill. This is a mill-funded operation and ensures that the area always has the highest cane quality possible.

Seedcane producers like Dustin make it possible for growers to access good quality seedcane and to realise their benefits, including:

- Good seed ensures that your fields are true-to-type i.e. genetically pure.
- Your variety has a prolonged lifespan.
- There is even germination of the sugarcane on your fields.
- Your crop is more likely to adapt to the climate that the variety was bred for and the cropping system of the location.
- There is a lower risk of serious pest or disease outbreaks.
- An improved likelihood of high yields due to a higher quality crop.

In order to ensure that the seedcane to be planted is from a valid source, all growers are encouraged to confirm that the seedcane supplied is from a certified producer, with the necessary nursery facilities.

In Dustin's area, all seedcane co-operators also serve as bulking co-operators due to the existence of the nursery facilities on their farms. The further involvement of the mill in this scheme has permitted a smoother operation of both the seedcane scheme and bulking of new varieties for use as potential seedcane in the area. The co-operators are situated in all eco-zones across the region which ensures that the potential of any new variety can be evaluated more accurately in terms of optimal soil type, climatic conditions, etc.

Once these new varieties have been 'bulked', SASRI Extension Specialist and Biosecurity Officer, Adrean Naude, ensures distribution of 50% of the first harvest to neighbouring growers so that they are also able to test these newer releases on their farms. The balance of seedcane is sold at the standard certified price by the seedcane co-operator.



▲ Hot water treatment plant at Gledhow Mill



Orange Rust Alert

Sharon McFarlane (Plant Pathologist), Rowan Stranack (Extension and Biosecurity Manager) and Aimee Koch (Molecular Biologist)

Orange rust (*Puccinia kuehnii*) spores have been detected on a spore trap located on the SASRI Research Station at Komatipoort, but this disease has not yet been found on sugarcane in South Africa. Please be on the lookout and report any suspicious symptoms to your local SASRI Biosecurity Officer or SASRI Extension Specialist as orange rust is likely to spread rapidly through the industry after the first infections have been observed.

None of the South African varieties that have been evaluated in Australia and Florida have been rated susceptible but five varieties (N32, N41, N42, N49 and N52) have been rated intermediate (see below). Please note, a number of our varieties have not been tested under environments where orange rust is present, so please look for symptoms on **all** varieties of **all** ages in **all** regions of the industry.

Intermediate

N32, N41, N42, N49, N52

Resistant

N12, N14, N21, N23, N25, N26, N29, N30, N31, N35, N37, N39

Yield effects

Rusts reduce photosynthesis and use up nutrients while invading the plant. They damage the epidermis of the leaf, affecting the plant's ability to regulate water loss, causing severely infected leaves to die prematurely. All these factors contribute to yield loss. Severity, persistence and associated yield loss will vary from year to year depending on the climatic conditions and the varieties being grown, but losses of 15 to 20% have been demonstrated.

Spread

Rusts produce spores that are microscopic, light and hardy making them well adapted to rapid short and long distance dispersal by wind and water splash. Rusts are not spread by planting infected seedcane. Infections are favoured by warm, humid conditions so the disease is most commonly observed in spring and early summer. Symptoms are usually seen on older cane (>6 m).

Management

Varietal resistance is the most economical management option but it becomes more challenging to breed

for resistance when more than one rust pathogen attack a crop. Resistance to one rust does not mean a variety will be resistant to others e.g. N12 has excellent resistance to brown rust but has some susceptibility to tawny rust.

Mixed rust infections on one variety have also been observed. Genetic changes in rust pathogens can sometimes result in resistant varieties becoming more susceptible. Planting no more than 30% of your farm to one variety can reduce the risk and impact of pests and diseases.

The fungicide Amistar Xtra® (500mL per ha in 300-400L water with wetter) is currently registered for the management of orange rust on sugarcane in South Africa.

Early indications are that yield losses are similar to those caused by brown rust and severe infections will reduce yields substantially. The disease is most common and severe in spring and late autumn. Temperatures above 30°C limit disease development.



Symptoms

- Early symptoms include yellow flecking that can be seen on both leaf surfaces. The flecks gradually elongate and turn reddish-brown from the centre.
- Lesions tend to be more concentrated near the leaf tip.
- Profuse, bright orange spores eventually erupt from pustules within these lesions. More pustules develop on the underside of the leaf but are also common on the upper leaf surface.
- As pustules mature and spores are dispersed, it becomes more difficult to distinguish tawny rust from brown rust.
- Infected fields have a general orange-brown appearance.
- Symptoms are often most severe on the leaves closest to the ground in young plants.
- Severely infected leaves may die prematurely.
- Symptoms have been observed on plants of all ages.

Rust Identification Chart



BROWN RUST (*Puccinia melanocephala*)

Lesions (marks) on leaf:

- Cinnamon brown to dark brown
- Up to 20 mm long
- More severe towards leaf tip

Spores:

- Brown when fresh
- Usually only on the lower leaf surface

Favoured by cool nights, warm days

Tends to occur on young crops (< 6 months)

Lesions (marks) on leaf:

- Orange to reddish-brown
- Similar in size to brown rust
- More severe towards leaf tip

Spores:

- Orange when fresh, profuse
- Also occur on upper leaf surface

Appears to be favoured by cool, moist weather

Has been observed on cane of all ages

TAWNY RUST (*Macruropyxis fulva sp. nov*)



ORANGE RUST (*Puccinia kuehnii*)

Lesions (marks) on leaf:

- Orange to reddish brown
- Up to 4 mm long
- More severe towards leaf base

Spores:

- Orange when fresh
- Usually only on the lower leaf surface

Favoured by humid, warm conditions

Tends to occur on mature crops (>6 months)

'App'-ropriate Ripening

 Kerisha Raghunandan (Publications Officer)

Mobile apps have taken over the modern world of technology. Used for anything from daily banking transactions to navigating to your next holiday destination, if you have a smart phone or tablet, mobile apps are completely unavoidable. Their ease of use and handiness have allowed them to flourish in a world where convenience is defined by access at your fingertips. Joining this modern wave, SASRI has developed its first contribution to the mobile app world.

Dr Riekert van Heerden (SASRI Plant Physiologist) and his ripening research team have just produced a mobile app aimed at assisting growers with their ripening decisions. Aptly dubbed **PurEst™**, this app estimates juice purity which assists with ripening decision-making based on hand-held refractometer measurement of Brix% in sugarcane stalks.

What's in it for me?

PurEst™ is a tool that allows the grower to rapidly determine crop maturity in order to make ripening decisions on the farm. The estimated whole-stalk juice purity is used to derive practical ripener recommendations based on the known juice purity efficacy thresholds for the various ripener chemicals. In addition, the actual Brix% readings can be used to track ripener efficacy (fine-tuning of spray-to-harvest intervals).

PurEst™ can also assist with drying-off and harvesting decisions by estimating stalk moisture % and RV% so that growers can manage and prioritise fields that are ready for harvest. One must however bear in mind that **PurEst™** estimates these quality parameters in the living crop and that the tool cannot account for changes that occur due to burning and harvest-to-crush delays. Hence, the tool is meant for on-farm use to assist in ripening and harvest decision-making and cannot replace the accredited analytical services provided by Cane Testing Services (CTS). Users of the app must also take into account weather conditions, eldana numbers and the status of the crop before choosing to ripen.

How can I get my hands on it?

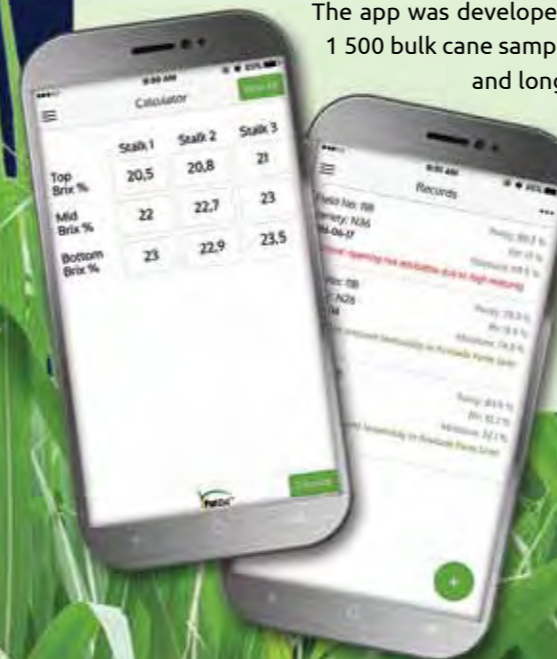
In order for you to get started with using the app, you will require a handheld refractometer for taking Brix% readings and your ever-handy smartphone or tablet.

PurEst™ has just been released on both iOS and Android platforms. You can download the app via the Apple iStore or Google Play Stores using your once-off validation code. These codes have been sent to South African growers and millers and are also available from your Extension Office. Once **PurEst™** has been activated on your phone or tablet, you can access the electronic user guide explaining how to take the refractometer measurements, how to use the app, and how to interpret its output.

How was it made?

The app was developed through parallel laboratory and hand-held refractometer analysis of nearly 1 500 bulk cane samples (12-16 stalks) across 26 different varieties. This sample set included annual and longer cycle cane collected from both rainfed and irrigated fields throughout the industry (KZN and Mpumalanga).

Brix% was determined with hand-held refractometers in cane juice squeezed from the top, middle and bottom thirds of the stalks. All samples were analysed in the SASRI cane testing laboratories at Mount Edgecombe and Pongola for whole-stalk juice purity, RV% and stalk moisture%. Through a rigorous process of statistical analysis, correlations between the hand-held refractometer measurements of Brix% and these three variables were established. This was the birth of **PurEst™**.



Toe-paslike Rypmaking

Kerisha Raghunandan (Publications Officer)

Mobiele toepassings het die moderne wêreld van tegnologie, soos ons dit ken, oorgeneem. Met toegang tot 'n slimfoon of tablet is die gebruik van mobiele toepassings op die punte van ons vingers, hetsy om banksake te doen of om by jou volgende vakansiebestemming uit te kom. Die gemak en nuttigheid veroorsaak dat mobiele toepassings floreer in 'n wêreld waar gemak met die druk van 'n knoppie gedefinieer word. Om in pas te bly met moderne tegnologie, en die gejaag daarna, het SASRI onlangs hul eerste mobiele toepassing vrygestel.

Dr Riekert van Heerden (SASRI rypmakerkundige) en sy navorsingspan het 'n mobiele toepassing, wat daarop gemik is om boere by te staan met "op die plaas" rypmakerbesluite, ontwikkel. Die toepassing, **PurEst™** beraam suikerriet se sapsuiwerheid met behulp van 'n hand-refraktometer wat Brix% in suikerrietsap meet en boere in staat stel om die nodigheid van rypmaker toedienings te bepaal.

Hoe kan ek baat vind?

PurEst™ is 'n toepassing wat die boer in staat stel om vinnig die volwassenheid van riet op die plaas te beraam en besluite te neem ten opsigte van sy rypmaakprogram. Die beraamde sapsuiwerheid word aangewend om praktiese rypmaak aanbevelings te verskaf en is gebaseer op die bekende sapsuiwerheid drempelwaardes van die verskillende rypmaker chemikalieë. Die werklike Brix% waardes kan ook gebruik word om die effektiwiteit van die chemikalieë te volg na toediening om sodoende die optimum spuit tot oesinterval akkuraat te bepaal.

PurEst™ kan verder help met afdroog- en oesbesluitneming deurdat die toepassing ook stronkvog% en RV% vanaf die Brix% waardes beraam. Boere kan sodoende hul oesprogramme fyner bestuur deur die kapvolgorde van lande te prioritiseer. Daar moet egter in ag geneem word dat **PurEst™** hierdie kwaliteit-parameters in lewende riet beraam en dus nie veranderinge in ag kan neem wat plaasvind nadat die riet gebrand, gekap en deur die meul gaan nie. **PurEst™** is bedoel vir aanwending op die plaas om boere by te staan met rypmaak- en oesbesluitneming en kan nie die geakkrediteerde analitiese dienste vervang wat deur die meulaboratorium (CTS) gelewer word nie. Gebruikers van hierdie toepassing moet ook die weerstoestand, eldana vlakke en die stand van die riet in ag neem voordat daar finaal op rypmaking besluit word.

Hoe kan ek dit bekom?

Om die toepassing te kan gebruik benodig die gebruiker 'n hand-refraktometer en 'n slimfoon of tablet. **PurEst™** is vir beide iOS en Android bedryfsisteme vrygestel. Laai dit af op die "Apple iStore" of die "Google Play Store" en gebruik die eenmalige verifikasie kode om dit te aktiveer. Hierdie verifikasie kode kan via E-pos by die voorligtingskantoor aangevra word. Sodra **PurEst™** op die slimfoon of tablet geaktiveer is, kan die elektroniese gebruikershandleiding binne die toepassing gebruik word om vas te stel hoe om refraktometer lesings te neem, hoe om die toepassing te gebruik en hoe om die resultate te interpreteer.

Hoe is die toepassing ontwikkel?

Die toepassing is ontwikkel met behulp van parallelle laboratoriumanalise en hand-refraktometer lesings op ongeveer 1500 stronkmonsters (12 – 16 stronke per monster) oor 26 verskillende variëteite. Die monsters het seisoenale (eenjarige) sowel as langsiklus riet afkomstig van beide droëland en besproeiingsareas in KZN en Mpumalanga ingesluit. Brix% lesings is met die hand-refraktometer geneem op sap wat gepers is vanaf die middelpunt van die onder-, middel- en boonste derdes van die stronke. Dieselfde monsters is daarna in die SASRI rietkwaliteit laboratoriums te Mount Edgecombe en Pongola geanaliseer vir sapsuiwerheid, RV% en stronkvog%. Met behulp van statistiese analises is die korrelasies tussen die refraktometer Brix% waardes en die genoemde kwaliteits-parameters vasgestel. So het **PurEst™** tot stand gekom.



Advice from **FAS**

Agricultural laboratory service for the analysis of soil, leaf, fertiliser and other products



FAS has introduced a new 'potassium reserve' soil test which has the potential to significantly reduce fertiliser input costs over large areas of the industry.

FAS breakthrough: new 'potassium reserve' test implemented

Neil Miles (Senior Soil Scientist)

Soils of southern African sugar industries are highly variable. From the point of view of meeting crop potassium (K) requirements, it has long been known that those soils that contain significant amounts of mica-type clays have relatively low K requirements. This is because these clays harbour large reserves of K, a portion of which becomes available to the crop during the growing season.

Wide variations in K reserves occur in sugar-producing soils, with the rainfed coastal and midlands areas of South Africa generally having low reserves, while areas to the north have high to extremely high reserves. These findings reflect a potential for massive savings in fertiliser K in areas with the higher reserve K levels.

Unfortunately, this 'reserve K' is not detected by the 'routine' soil K test performed in soil testing labs, but requires a relatively harsh (and dangerous) extraction with boiling nitric acid for its measurement. With the nitric acid K test not being suited to use in a high throughput laboratory, soil testing services have, up to now, ignored reserve K levels.

However, FAS's recent acquisition of a state-of-the-art mid-infrared spectrometer has made it possible to rapidly measure reserve K on air-dried soil samples, with there being no need to carry out the troublesome nitric acid extraction on every sample. Following this development, K recommendations are now modified to accommodate the reserves of this nutrient measured in soil samples submitted by growers. The modifications introduced are based on research in both local

and Australian field trials with sugarcane and other crops. Information gleaned from these trials confirms that soils with high K reserves can produce optimum yields for many years with no K fertiliser applications; however, where K reserves are low, the full K requirement must be supplied in order to sustain production levels.

In FAS's new K recommendations package, K requirements are adjusted on a sliding scale according to the levels of reserve K determined in the soil samples submitted by growers.

Reserve K levels in soils from the sugar producing areas in southern Africa indicate the presence of appreciable K reserves, and thus the opportunity for considerable savings in K fertiliser. Some areas, especially towards the north, have high enough reserve K levels for healthy production to be maintained for many years with no K fertiliser being applied, resulting in massive fertiliser savings!

"I no longer use blanket applications of fertiliser. FAS has saved me thousands by determining exactly how much NPK my fields need"

Dieter Lütge (North Coast grower) ►



Advies beskikbaar **FAS**

Landbou laboratoriumdienste vir die ontleding van grond, blaar, kunsmis en ander produkte.

FAS het 'n nuwe "kalium reserwe" grondontleding bekendgestel, wat na verwagting die insetkoste vir kunsmis, oor 'n groot deel van die industrie, daadwerklik kan verminder.

FAS deurbraak:

nuwe "kalium reserwe" grondontleding word geïmplementeer.

Neil Miles (Senior Grondkundige)

Die gronde van die Suid-Afrikaanse suikerindustrie varieer geweldig baie. Ten einde aan die gewas se kaliumbehoefte (K) te voorsien, is dit lank reeds bekend dat gronde wat baie mika-tipe kleie bevat, relatief lae kaliumbemesting behoeftes toon. Die rede hiervoor is dat die tipe kleie groot K-reserwes bevat, waarvan 'n gedeelte deur die groeiseisoen beskikbaar word vir die gewas.

K-reserwes in die gronde wat suikerriet produseer, varieer baie wyd. Die droëland-gebiede aan die kus en middellande het oor die algemeen lae K-reserwes, terwyl die noordelike areas hoog tot baie hoog K-reserwes het. Die bevindinge dui op 'n potensiële massiewe besparing in K-bemesting in die gebiede met hoë vlakke van K-reserwes.

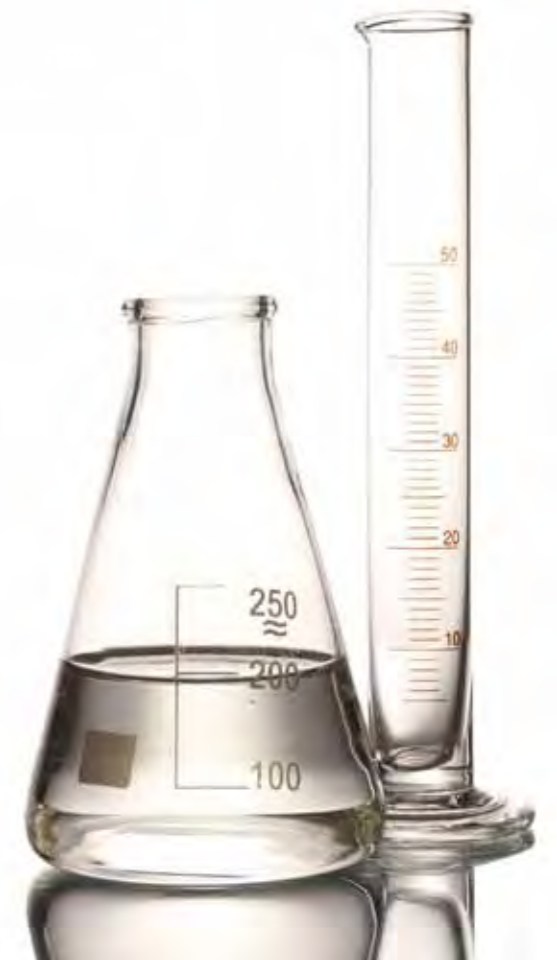
Ongelukkig word die K-reserwes nie deur die roetine K-toetse, wat in grondlaboratoriums gebruik word, waargeneem nie. Hiervoor is robuuste (en gevaarlike) onttrekking met kokende salpetersuur nodig. Omdat die salpetersuur K-toetse nie geskik is vir gebruik in hoë omset laboratoriums nie, het grondontledings dienste tot dusver reserwe K-vlakke geïgnoreer.

Die tegnologie gevorderde mid-infrarooi spektrometer, wat FAS onlangs bekom het, maak dit egter moontlik om vinnig K-reserwes van luggedroogde grondmonsters te meet, sonder om die moeisame salpetersuurekstraksie metode vir elke monster te gebruik. Vervolgens sal K-aanbevelings aangepas word om die K-reserwes in te sluit by die waardes gemeet in grondmonsters, wat deur kwekers ingehandig word. Die aanpassings word gebaseer op navorsing op plaaslike asook Australiese veldproewe met suikerriet en ander gewasse.

Inligting uit die proewe verkry, bevestig dat dit moontlik is om op gronde met hoë K-reserwes, oor baie jare, optimale opbrengste te lewer sonder dat enige K-kunsmis toediening nodig sal wees. Waar grond K-reserwes egter laag is, moet bemesting die volle K-behoefte voorsien om produksievlakke vol te hou. In FAS se nuwe K-aanbevelingspakket sal die K-behoefte op 'n glyskaal aangepas word, op grond van die reserwe-K vlakke in die grondmonsters, wat deur kwekers ingehandig word.

Die gronde van die Suid-Afrikaanse suikerproducerende areas toon die teenwoordigheid van aansienlike K-reserwes, en so ontstaan die geleentheid om aansienlike besparings in K-bemesting te maak.

Die K-reserwes in sekere areas, veral in die noorde, is hoog genoeg om in die toekoms, vir etlike jare, optimale produksie te handhaaf, sonder die nodigheid van enige K-kunsmis toediening wat tot massiewe besparing in insetkoste sal lei.



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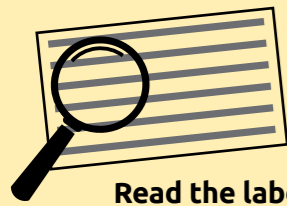


Agrochemicals: Friend or Foe?

 Prabashnie Ramouthar (Nematologist)

Agrochemicals provide growers with the necessary tools to manage the many pests and diseases associated with growing commercial crops. They are thus an essential part of a high yielding farming system. This need is recognised and has resulted in over 8 000 chemicals being registered for use on various crops in South Africa with approximately 162 registered for use on sugarcane. Many of these chemicals however, do have negative effects on humans and can cause harm to both humans and the environment if not used responsibly.

The three cornerstones of responsible agrochemical use are:



Read the label

The product label is a legal document and contains a wealth of information about a product. In addition to application rates and frequency, the label provides information on the toxicity of the product and the conditions under which it can be used. The label also provides information on how to apply and dispose of the product and its packaging correctly in order to minimise the impact on humans and the environment. Ensure that you are familiar with the label and the requirements.



Ensure that the chemical is registered

By law, each chemical must be registered with the Department of Agriculture, Forestry and Fisheries before it can be used on a specific crop. A product registration for a specific crop means that the product has been tested on that crop and has been shown to work at the specified application rate, frequency and application method for which the registration is held. More importantly, it also means that the product is safe to use at that rate, frequency and method, and that it will have minimal effect on humans and the environment. It is therefore very irresponsible, particularly with respect to humans and the environment, to use unregistered chemicals.



Choose chemicals wisely

In the interest of the environment and product longevity, it is imperative that chemicals are chosen wisely. Rotate chemicals with differing modes of action to reduce the risk of the development of resistance. If available, choose chemicals with low toxicity and low impact on the environment.

With the array of agrochemicals that need to be used to grow a successful crop of sugarcane, these three simple steps can be quite cumbersome. Fortunately the agrochemical section within SUSFARMS® can provide growers with the tools to make these choices and use chemicals in a responsible manner.

Agrochemicals used in the correct way and for a specified purpose is definitely a grower's friend. However, if not used correctly, the efficacy of these chemicals will be drastically reduced and can prove to be a waste of money. More importantly, it could also have serious detrimental effects on the environment and human health, hence it can be a foe.

The following WRC report highlights the importance of paying particular attention to the responsible use of agrochemicals.

Investigation of the Contamination of Water Resources by Agricultural Chemicals and the Impact on Environmental Health WRC Report: 2015

The Lomati catchment which drains into the Komati River in the vicinity of Komatipoort, is characterised by the WRC as dominated by sugarcane production as well as other tropical and citrus fruits. Over the past five years (2010 -2015), this area was monitored for the presence of various selected agrochemicals.

During this period, atrazine, imidacloprid, terbuthylazine and carbofuran were detected relatively frequently in this catchment. These chemicals are regarded as being highly mobile in the soil. Hexazinone, diuron and ametryn were also frequently detected. Samples were also collected from the Langloop purification works and these showed similar concentrations of the pesticides. Treatment therefore did not succeed in removing these chemicals from the water.

Although these pesticide were detected, the levels at which they occurred were considered not to be harmful to human health.

Despite the outcomes of this study showing no negative effect on human health, the detection of pesticides in our water resources is particularly worrying and requires attention. Ensuring agrochemicals are used in a responsible manner is not only the responsibility of the government, chemical company or grower, but the responsibility of every South African citizen as this affects us all.

For further reading:

Pin-pointing pesticide contamination and the damage it can do to people, January/February 2016, The Water Wheel, Pg 27-31.



SUSFARMS® Promoting sustainable sugarcane cultivation

 Michelle Binedell (Knowledge Manager)

SASRI has been a long-standing proponent of sustainable sugarcane cultivation, supported by decades of research. Recommendations resulting from laboratory, glasshouse and field trials over the years have considered not only the agronomic advantages of a practice, but also how socially acceptable these practices are and whether they are economically viable.

While these practices have been regularly shared with industry stakeholders, it was not until the late 1990s that a formal environmental management system for the South African sugar industry was initiated. The purpose was clear – to improve environmental standards of sugarcane farming. Over the years that followed, this system developed into SUSFARMS® (Sustainable Sugarcane Farm Management System).

SUSFARMS® has received much support throughout its development. Local growers and millers have been supported by commercial companies, non-governmental organisations and international network organisations who have sourced significant funding for the initiative. This locally developed system is also globally recognised as a significant and credible farm improvement system.

SUSFARMS® is a practical tool that guides implementation of better management practices (BMPs). It is a comprehensive collection of legislative requirements as well as BMPs that can (amongst others) ensure worker health and safety, facilitate more profitable production and promote environmental stewardship. The accompanying Progress Tracker is a self-assessment tool that can be used to determine performance against a set of measures and offers advice on how to improve the situation. In the KZN Midlands region, SUSFARMS® is being used to demonstrate to our major consumers our commitment to sustainable sugar production.

For more information on how to access SUSFARMS® please contact your Extension Specialist or email library@sugar.org.za.

Weather

by Phillemon Sithole (Agrometeorologist) and Abraham Singels (Principal Agronomist)

Review

Most of the industry's rainfed regions received well above normal rainfall in May and July 2016, particularly in the coastal areas (Fig 1). July 2016 rainfall was one of the highest ever recorded for the month in the South Coast region with some stations recording over 300 mm within 24 hours. Rainfall was generally normal in March (except Zululand), but well below normal in April and June. In the northern irrigated regions (Pongola and Mpumalanga) rainfall was mostly well below normal, except for March and July when rainfall was near normal. Minimum temperatures over winter in the Midlands area were generally mild with only isolated cases of minor frost damage reported.

Irrigation water supply remains critically low in Zululand and Mpumalanga due to the prolonged drought in those catchments.

Outlook

The El Niño-Southern Oscillation (ENSO) system is currently in the neutral phase, with projections indicating possible development into a weak La Niña (cold phase) or neutral phase through spring and into the 2016/17 summer. A neutral ENSO is generally associated with normal summer rain for the industry. The South African Weather Service (SAWS) predicts below normal spring rainfall for most of the rainfed parts of the industry while normal to above normal average rainfall is expected for the northern irrigated regions. SAWS further predicts above normal early summer (October to December, 2016) rainfall for the whole industry. The International Research Institute for Climate and Society and the European Centre for Medium-Range Weather Forecasts predict normal spring and early summer rainfall across the industry.

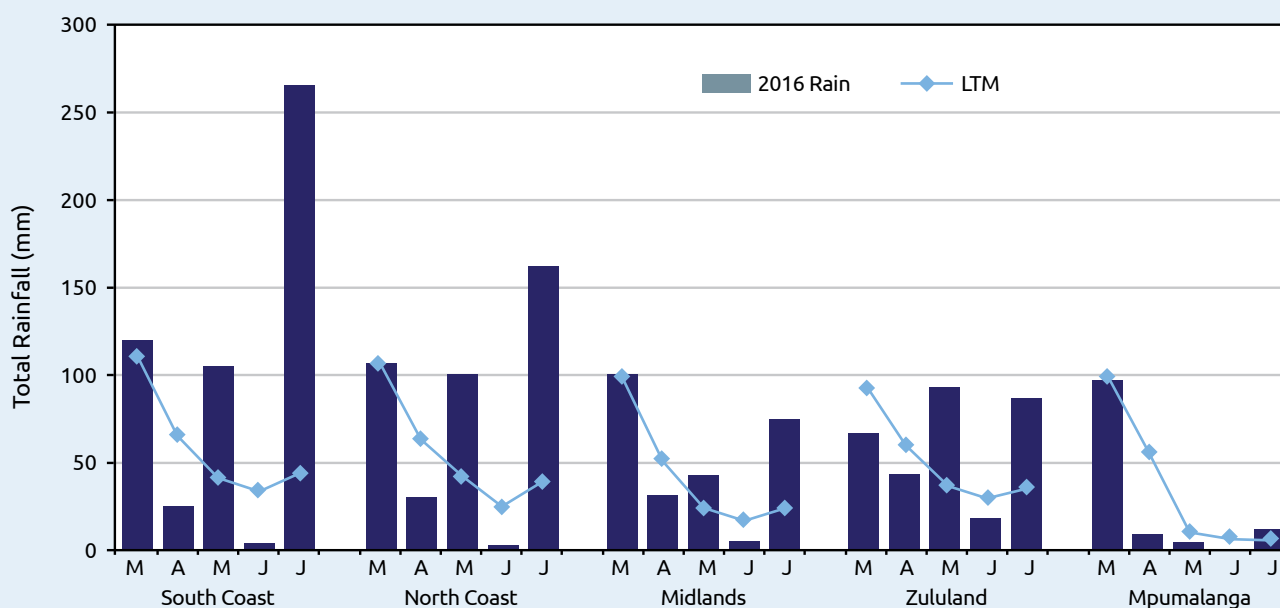


Figure 1: Regional average monthly total rainfall for 2016 (March to July) and the monthly long term means (LTM).

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

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