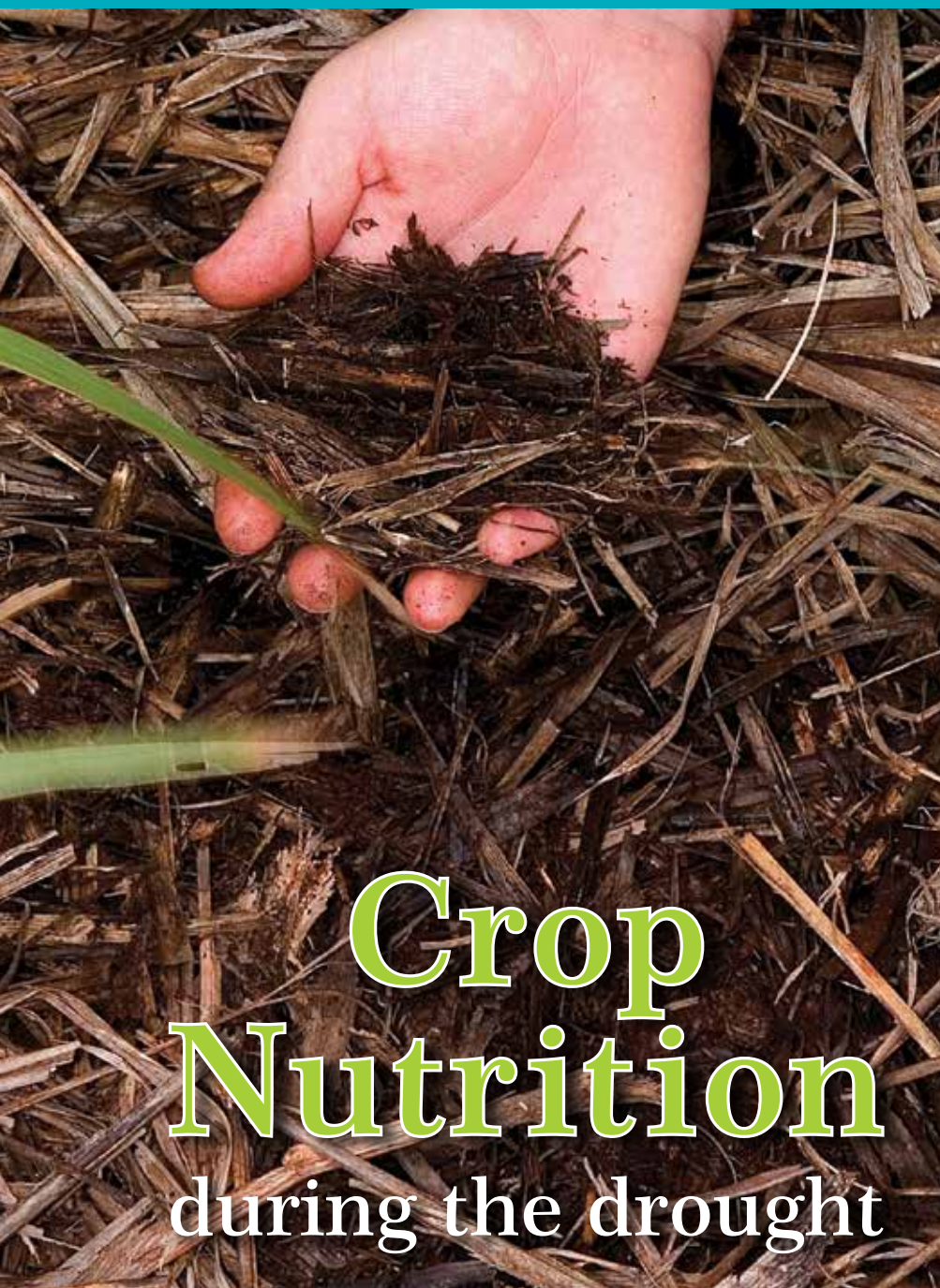


THE Link

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The current dry conditions experienced throughout the industry has resulted in significant adjustments having to be made to your fertiliser programme. The article on page 16 outlines the necessary N:P:K amendments recommended for harvested and carry-over cane during this period.

Also in this issue...

Neem van grondmonsters

Monsterneming van lande om verteenwoordige inligting van die land te verkry is baie belangrik. FAS verduidelik hoe om grondmonsters korrek te neem sodat beplanning gedoen kan word vir jou kunsmis program. (Bladsy 10).



Identifying sugarcane diseases

Unfamiliar symptoms in your sugarcane could be the result of either pests, diseases, nutrient disorders or weather conditions. The article on page 14 gives more insight on how to diagnose these field abnormalities.



Mulching vs Burning

The effects of a mulch layer during green cane harvesting is compared to burning of fields during harvest. The results of this study were repeated over five ratoons for eight different varieties. (Page 22)



Unlocking the potential of sugarcane

Message from the... DIRECTOR

With the release of the latest edition of SUSFARMS® (v3.0) towards the end of last year, it falls to all growers to identify how they can use it to add the most value to their operations.

In the industry-wide roadshow held last year to publicise this farm-management system, the single most important message conveyed to growers was that they should begin the SUSFARMS® journey by using the Progress Tracker to establish areas in which they already comply with required legislation and recommended better management practices.

A key message was that it was simply not expected that they would fulfil each and every measure from the outset. Rather, the real value of SUSFARMS® lies in the guidance that it offers in progressively demonstrating the pathway for improving management practices to ensure long-term sustainability and profitability. The fact that each and every grower begins the SUSFARMS® journey by simply adhering to the law, makes it a very easy philosophy to adopt.

At the last Agronomists' Association symposium it was very heartening to hear of the success achieved by one of our North Coast growers, Anthony Goble, as a consequence of following SASRI advice and adhering to better management practices. He echoed the value of using SUSFARMS® as a checklist for tracking such good practices. In receiving not only the KZN Young Farmer of the Year tribute, but also the National

Young Farmer of the Year award, Ant has provided a fabulous example to all sugarcane growers. Through adherence to good management principles recommended by SASRI (together with a strong dose of strategic vision), he has demonstrated that it is possible to weather the conditions we are currently living through, and continue to produce remarkably good yields. We salute him!

Looking forward to the forthcoming season, the outlook remains worrying. In a presentation at the SASTA AGM, SASRI's Principal Agronomist, Abraham Singels, provided an update of the current season and some weather predictions for 2016. From these predictions, it would seem that the drought is likely to continue, placing us in a similar situation to that of the early 1990s. Since these weather patterns are common in South Africa, it is clear that without proactive implementation of good farming practices to enhance water conservation and soil health,



Dr Carolyn Baker

growers' ability to withstand such climatic adversity is compromised. Only those growers that have wisely incorporated such practices into their operations over a period of time, and since the last major drought, will emerge relatively unscathed.

From SASRI, we encourage growers to look to their Extension Specialist for advice and support for implementation of better management practices, and in so doing develop a robust farming system that will aid in mitigating the risks associated with future climatic variability.



North Coast Grower, Anthony Goble and local Extension Specialist, Adrean Naude

A sweet reward for a young farmer



by Kerisha Raghunandan
(Publications Officer)

Anthony Goble, a sugarcane grower in the Upper Tongaat area has recently been awarded not only the KZN Young Farmer of the Year at the 2015 Kwanalu Congress, but also the prestigious 2015 National Young Farmer of the Year Award. The esteemed provincial title is awarded to any farmer under the age of 35 who is a full member of their province's union and who has demonstrated all-round excellence in his/her agricultural practices as well as sound business acumen which is reflective of their practical competencies. This title then allows the farmer automatic entry into the National competition where they are up against fellow South African winners from various agricultural sectors.

From the ground up..

Ant, as he is affectionately known, inherited the 600 ha Evelyn Park farm from his father who passed away in 2000. At the time Ant was at Rhodes University studying a Business Science degree majoring in Management and Information Systems. During this period, his mother assisted in running the farm until he completed his degree. Thereafter, Ant took over and supplemented his knowledge by attending the SASRI Senior Certificate course in 2004. Here, he was made aware of the agronomic importance of healthy soils and roots, seedcane nurseries, selecting the correct varieties, identification of pest and disease threats as well as other best management practises. In consultation with his local Extension Specialist, Adrean Naude, Ant began to ameliorate his farm, starting first by paying attention to his soils.

The proactive approach

In the years to follow, Ant's farm grew from 600 ha to over 1000 ha, with 350 ha under lease. He has invested in seedcane nurseries which allow him to sell clean seed to his neighbouring growers; improved his top and sub soil acidity by applying a mix of lime and gypsum; green-cane harvested his fields where possible to conserve soil moisture and improve soil health; implemented green manuring to assist in nutrient management and has diversified his eldana spray programme by spraying both Coragen® and Fastac®.



Anthony Goble is a true ambassador of the sugar industry. His integrated approach to farming and awareness of better management practices allows him a handle on all aspects of the business, even during the current difficult times that the agricultural sector is experiencing.

He treats each of his fields individually by conducting soil and leaf sampling to understand the status of each crop and to investigate any deficiencies. This has resulted in huge cost savings for both fertiliser and lime applications as he can now accurately determine how much is required rather than making blanket applications to every field. Further to this, by paying close attention to detail, Ant is able to create high yielding sustainable cane fields that he calls "pockets of excellence" on his farm.

In order to historically view trends on his farm as well as monitor his field management, Ant has invested in a well-established computerised system to keep track of his field records. This allows him to have a keen sense of the impact of various farming practises and administrative decisions.

Ant has also diversified into bananas and macadamias, both of which have completely different demands to sugarcane. In addition to this, Ant is Chairman of the Gledhow Farmer's Association and Director of the Gledhow Sugar Company as well as a founding member of the Upper Tongaat Study Group.



Planting

From now, through summer, chemical stool eradication is the only way to effectively kill the old crop prior to replanting. However, applying glyphosate also does not necessarily guarantee a 100% kill. Take care to apply glyphosate to fully tillered, actively growing cane, no taller than knee height, using clean water. In dry conditions such as at present, tillering could be erratic and extra care is required. Add buffer solution and recommended adjuvants. Do not plant until all living plant material has been killed either through removal or respraying. With seedcane fields, apply a long fallow to ensure 100% crop eradication.



Fertiliser

Rainfall has been very low and erratic this spring. Seriously consider split applications of fertiliser to ensure the effective use of nutrients and to save money. If the first split has already been applied, only apply the second after reasonable rain has fallen and the prospects for further growth look good.

Topical



Eldana and thrips

Levels of eldana in the southern coastal and high altitude areas of the industry have increased significantly due to the on-going drought. Whilst extensive spraying of new products to control eldana has been undertaken, it is vitally important to regularly scout for the pest and to complete the spray programme. Remember to rotate chemicals to reduce the risk of the pest from developing resistance to a particular chemical.

The weather outlook for the summer is not promising and there could well be further pressure from eldana, requiring the highest possible level of vigilance from growers. Biosecurity teams are not able to inspect all carry-over cane and growers are strongly urged to regularly inspect their fields to supplement LPD&VCC inspections.

Thrips numbers peak in summer. Consider the application of Bandit® in the furrow in order to minimise possible damage from this pest.

Tips

Smut

Indications are that this year smut levels could be higher than last summer. Regular roguing, either chemical or manual, will ensure this disease does not gain a foothold. When roguing manually, ensure that the whips are removed, taken out of the field and destroyed. Any infected stools must be completely dug out of the ground preventing any possible regrowth. Popular varieties such as N25 and N41 are proving increasingly susceptible to smut. Make sure they are regularly inspected and rogued in order to guarantee their continued existence.



Weed control

Following a dry spring and slow growth of the crop, weeds are likely to remain a problem well into summer. Spot-spraying is the most effective way to keep weeds under control, but large grass weeds e.g. Sorghum and Panicum species, will have to be hand-weeded to prevent seeding and spread.



by Rowan Stranack
(Extension and Biosecurity Manager)



Water use

Although rainfall is scarce at the moment, do not neglect the need for effective surface water management in newly planted fields. Wide, well-protected stable streams and waterways, properly functioning conservation structures and green cane harvesting will all contribute to the conservation of valuable soil and water once good rains return.

In irrigated areas where restrictions are in place, prioritise the allocation of water to plant cane, young ratoons and seedcane.



SUSFARMS®

SUSFARMS® is the preferred management system to ensure sustainable and profitable sugarcane farming. It is the management tool all growers should be using. Contact your Extension Specialist to discuss implementing SUSFARMS® and to obtain the latest version of the Progress Tracker which will enable you to determine the status of your farm.



The case for Green Cane Harvesting

The ongoing drought has served to focus renewed interest in green-cane harvesting (GCH). Fortunately, for the grower contemplating the adoption of this practice, it is by no means a step into the unknown. The merits and drawbacks of GCH are well established from long-term SASRI field trial research programmes, as well as experiences of growers who have been GCH for decades.

To many growers, the challenges associated with GCH appear insurmountable. These relate to:

- reduced cutter productivity,
- cutter reluctance to harvest green cane,
- possible poor re-emergence of crop from under a heavy residue blanket,
- increased transport costs due to less-dense loads,
- fire hazard,
- movement of residues by wind, and/or
- increase in trash caterpillar numbers.

Whilst some of the above factors represent valid concerns, there are several ways of reducing the negative impact of these factors. For example, an extra incentive for cutters harvesting green cane will see cutters developing a preference for GCH. Growers with experience of this practice point to satisfactory cutter productivity in the long-term.

On the positive side, the significant benefits to be realised from GCH in general far outweigh any limitations:

Improved yields

As shown in the article on page 22, adoption of GCH frequently results in significant increases in yields, particularly in coastal areas.

Improved soil health

Bare soil is certainly not 'farming with nature'! A quick comparison of typical soil conditions under GCH with those under burning is particularly enlightening: soils under a residue blanket have a crumbly structure, are teeming with life (spiders, earthworms and other macro- and micro-fauna) and are generally moist. Under burning, soils are much drier, show no signs of life and often suffer from surface crusting and erosion.

The marked improvements in soil health under GCH are due largely to the steady build-up of topsoil organic matter levels under the residue blanket. Under burning, topsoil organic matter declines continuously – and so too does soil health.

Reduced erosion

A residue blanket protects the soil surface from the dispersive effect of raindrops, reduces erosion and prevents crusting.

Improved water supply to the crop

Research findings consistently reflect significant improvements in water-use efficiency under GCH, relative to burning. This is as a result of:

- reductions in evaporative loss from the soil surface,
- improved water infiltration (less runoff), and/or
- improved water-holding capacity of soils due to their having higher organic matter levels and improved structure.

SASRI scientists have shown that (relative to bare soil) scattered tops or a full residue blanket reduced runoff by 36% and 84%, respectively.

In irrigated areas, the savings in water under GCH allow a relatively larger area of cane to be irrigated for a given amount of irrigation water, thus resulting in increased overall returns.

Improved efficiencies in the cycling and uptake of nutrients

Steady increases in topsoil nutrient reserves (in particular, N, P and S) accompany the build-up of soil organic matter under GCH. Furthermore, K cycling is far more efficient under GCH than under burning. These considerations imply more tons of cane per kilogram of nutrient applied in the long term with GCH.

A particularly important consideration is that the availability to the crop of surface-applied nutrients is far greater under a residue blanket than on the bare soil. Once the soil surface dries out, nutrients residing there are totally unavailable for uptake by the roots. This aspect is of particular relevance in the optimisation of production of ratoons.

Reduced herbicide requirements

A significant benefit of GCH is the reduced herbicide requirements resulting from the suppression of weed growth by the residue blanket. In research trials, it has been found that residue may reduce weed populations by up to 90%. In addition to lowering input costs, lower herbicide applications are likely to be of benefit for long-term soil health.



by Neil Miles (*Senior Soil Scientist*),
Rian van Antwerpen (*Senior Soil Scientist*),
and Peter Tweddle (*Agricultural Engineer*)



Topsoils under long-term green cane harvesting (top right) and no residue return (top left) on the SASRI Research Station at Mount Edgecombe.



Die saak vir die Oes van Groenriet

Die voortdurende droogte het veroorsaak dat hernude aandag aan die praktyk van groen suikerriet oes (GSO) gegee word. Vir kwekers wat dit oorweeg om hierdie praktyk te volg, sal dit geensins 'n stap in die onbekende wees nie. Die voor- en nadele van GSO is ten volle nagevors deur lang termyn veld proewe wat deur SASRI gedoen is, asook die ondervinding van boere wat al vir dekades hierdie praktyk toepas.

Vir baie boere is die uitdagings geassosieer met GSO onoorkombaar as gevolg van die volgende uitdagings:

- afname in rietkapper produktiwiteit,
- rietkappers se weerstand om groenriet te oes,
- moontlike swak opkoms van die riet onder 'n dik laag van blaar- en plantreste,
- verhoogde vervoerkostes as gevolg van minder digte (ligter) vrage,
- brand gevaar,
- die wegwaai van blaar- en plantreste deur die wind, en/of
- verhoogde ruspe getalle wat voed op blaar- en plantreste.

Terwyl sommige van die bogenoemde faktore wel geldige bekommernisse is, is daar verskeie maniere om die negatiewe impak van die hierdie faktore te help bekamp.

So kan ekstra byvoordele vir rietkappers wat groenriet oes dit mettertyd verkies om eerder groenriet te wil kap. Boere met ondervinding van hierdie praktyk kan rietkappers se produktiwiteit in die lang termyn verhoog.

Aan die positiewe kant, betekenisvolle byvoordele van hierdie praktyk oorskry by verre enige beperkings:

Verhoogde oes opbrengs

Soos aangedui op bladsy 22, sal die aanvaarding van die GSO praktyk betekenisvolle verhogings in oes opbrengs veroorsaak, veral in die kus gebiede.

Beter grond gesondheid

Onbedekte grond is beslis nie die manier om "saam met die natuur" te boer nie! 'n Vinnige vergelyking van tipiese grondtoestande tussen grond waar groenriet geoes word en grond waar daar gebrand word is verblydend: grond onder 'n blaar- en plantbedekking het 'n krummelagtige struktuur en dit wemel met lewe (spinnepoppe, erdwurms en ander makro en mikro fauna) en is oor die algemeen klam; grond waar riet gebrand word, is baie droër, en tekens van korsvorming en erosie kan voorkom.

Die merkbare verbetering in grond gesondheid waar riet groen geoes word, is grootliks as gevolg van die volgehoue opbou van bogrondse organiese vlakke onder die laag van blaar- en plantreste. Waar die riet gebrand word, neem

die boggrondse organiese materiaal inhoud gedurig af, en daarmee tesame gaan grond gesondheid ageruit.

Vermindering van erosie

'n Laag plant- en blaarreste beskerm die grondoppervlak teen die verplasende effek van reëndruppels, verminder erosie en voorkom korsvorming.

Verbetering in water toevoer na die gewas

Konsekwente navorsings resultate reflekteer betekenisvolle verbetering in die effektiwiteit van water verbruik onder groen oes van suikerriet:

- vermindering in verdampingsverliese op die grond oppervlakte,
- verbeterde water infiltrasie (minder afloop), en/of
- verbeterde waterhouvermoë kapasiteit van grond as gevolg van hoër organiese materiaal inhoud en verbeterde grond struktuur.

SASRI navorsers het bewys dat (relatief tot onbedekte) blaar- en plantreste wat gestrooi is of waar 'n volledige laag van plantreste teenwoordig is, water afloop met 36% en 84% respektiewelik verminder.

In besproeiings gebiede, is die besparing in waterverbruik op lande waar riet groen geoes word van so 'n aard dat 'n groter gebied besproei word met dieselfde hoeveelheid water. Dit lei tot verhoogde algehele oesopbrengste.



Verhoogde effektiwiteit in die siklus en opname van voedingstowwe

Bestendige toename in boggrondse voeding reserves (veral N, P en S) gaan gepaard met die opbouing van grond organiese materiaal waar riet groen geoes word. K opname is baie meer doeltreffend met die groen oes van suikerriet as wanneer riet gebrand word. Hierdie oorwegings impliseer meer ton riet per kilogram voedingstof wat oor die lang termyn neergesit word.

'n Belangrike oorweging is die beskikbaarheid van voedingstowwe vir die gewas. Beschikbaarheid van oppervlak toegediende voedingstowwe is baie hoër onder die groen deklaag as by onbedekte grond.

Verminderde gebruik van onkruidodder

'n Beduidende voordeel van groen oes van suikerriet is dat minder onkruidodder gebruik word aangesien die blaar- en plantreste laag die ontkieming van onkruid onder die laag onderdruk. In veldproewe is bevind dat die blaar- en plantreste laag onkruid populasies met tot 90% kan verminder. Bykomend tot die afname in insetkoste, kan 'n afname in die gebruik van onkruidodder in die lang termyn bydra tot algemene grond gesondheid.



deur Neil Miles (*Senior grond wetenskaplike*),
Rian van Antwerpen (*Senior grond wetenskaplike*),
en Peter Tweddle (*Landbou ingenieur*)



*Boggrond onder langtermyn- groen suikerriet oes (regs) en geen oorblyfsel terugkeer (links)
op die SASRI Navorsings Instituut se gronde te Mount Edgecombe.*

Advice from FAS

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

Dealing with soil sample variability

If a grower had to ask three different fertiliser consultants to sample a particular field, the variability in soil test results and resultant recommendations would often be alarming. The reason for this is the variability in soil fertility occurring across most fields, which makes the taking of representative samples challenging. How does one deal with this problem?

In the first place, soil sampling procedures must be rigorously controlled:

- The Beater sampler should be used to ensure a constant sampling depth. Nutrient recommendations are based on topsoil (0-20 cm) samples – not on samples taken to greater or lesser depths.



- Each sample sent to the lab should comprise at least 30 cores (subsamples). The cores should be collected in a zig-zag or systematic pattern across the whole field.



- The area from which a single composite sample is taken should ideally not be greater than 5 hectares, and should be uniform with respect to soil type. In the picture (right), for example, the fertility of the bottomland soil would differ appreciably from that on the slopes, necessitating the taking of separate samples from these areas.

The second, and all too often overlooked strategy for minimising the impact of sample variability is to base recommendations on long-term trends, rather than on single soil test results. This is a key strategy for optimising efficiencies in the management of plant nutrition. It is important to keep all soil test reports, and enter results into a spreadsheet to establish long-term trends. This will assist in identifying any unreliable results and also enable informed decisions regarding subsequent fertiliser applications.

On the use of 'standard' blends...

For reasons of convenience, growers often apply 'standard' blends on all the fields in their operation, regardless of soil test results. Obviously, this greatly simplifies the ordering of product, and minimises effort in fertiliser application operations. Unfortunately, this approach to fertilisation is inefficient and wasteful and inevitably impacts the bottom line.

Consider, by way of example, a grower applying a standard blend supplying 120-25-120 (N:P:K) to all ratoon fields, which cover 250 hectares. If, as is often the case, only a small number of the fields require P, the P applications to the remaining fields would be unnecessary and have no impact on yields. Let's assume that in this example 200 ha required no P. By using the above blend the wasteful expenditure on P alone would have amounted to approximately



R165 000. The other side of the coin, of course, is that 'under-applying' nutrients such as N or K could imply serious losses in revenue through reduced yields.

The solution? Growers need to go the extra mile in grouping fields with roughly similar nutrient requirements, and ordering and applying fertiliser according to these groupings. Whilst this will imply extra effort, the benefits in terms of cost savings and improved yields will undoubtedly make the effort worthwhile!

Submission form problems....

FAS staff frequently have to deal with the problem of samples being submitted either without submission forms, or with forms that are incorrectly completed. This may delay the processing of the samples, or lead to incorrect recommendations in the

resultant reports. Along with this, the following guidelines need to be borne in mind when submitting samples:

- All samples must be accompanied by a submission form, with the exact identification on the actual sample (e.g. field number) also appearing on the submission form.
- There are different submission forms for the various types of samples (e.g. leaf, soil fertility, soil salinity, fertilisers).
- In the case of soil and leaf samples, the information supplied on the submission form has a major bearing on the recommendations appearing in the analytical reports. For example, in the case of soil fertility samples, the 'Attainable Yield' is crucial for the calculation of the N and K requirements of the crop.



by Neil Miles
(Senior Soil Scientist)



For more information, please consult the following references, all available on your InfoPack DVD:

- The video, Soil Sampling
- The book, Understanding and Managing Soils in the SA sugar industry
- SASRI Information Sheets





Is it a bird? Is it a plane?

The next time you look to the sky and see a strange winged object hovering overhead, think twice before telling everyone that the aliens have arrived. You have probably just witnessed a 'UAV' in action! From soaring through Hollywood taking aerial shots of celebrities to monitoring wildlife sanctuaries seeking out poachers, UAVs (Unmanned Aerial Vehicles) have become all the rage in recent years mainly for their ability to be the 'eye in the sky'. These versatile machines are now also being used in agriculture.

Regularly monitoring crops from the air can help farmers identify problems and make more informed decisions timeously. Satellite-based imagery can be used, but this tends to be infrequently updated, and of low spatial resolution or extremely expensive. Traditional aerial photography is also expensive, particularly if frequent updates are required. UAVs can provide much higher-resolution

imagery more frequently and at a fraction of the cost. UAVs can operate economically on small to medium (and remote) areas that would otherwise not be economically viable using fixed wing aircraft.

Agri-Sense, one of several companies now offering remote sensing services via UAVs, recently demonstrated the use of this technology at the SASRI Kearsney research farm. First, the UAV takes a set of normal RGB (red-green-blue) aerial images. Thereafter, a second set of NIR (Near Infra-Red) images are taken using a specialised camera. Both sets of images are then 'stitched' together to generate an NDVI (Normalised Difference Vegetation Index) image.

This geo-rectified map can be then be loaded onto the Agri-Sense app, providing the farmer with a management tool to efficiently scout the problem areas indicated on the map. The app also helps the farmers

communicate findings to the entire user group, streamlining communication and allowing for faster reaction times.

Based on all data received, the NDVI Imagery can be correlated with canopy cover, biomass measurements and crop stress providing the farmer with the tools to effectively manage his crop.

Imagery attained from UAVs can have many applications from monitoring crop health, to creating topographical maps combined with ground control points. Identifying accurate area under cane and crop density could help to create accurate estimates for the grower, miller and the industry.

Rapid turnaround times mean that the data collected can be acted upon quickly. This gives a farmer an opportunity to adopt a proactive approach to pest and disease control or other factors limiting crop potential.



by Kerisha Raghunandan
(Publications Officer)

What is wrong with my field?



by Sharon McFarlane
(Plant Pathologist)

If your sugarcane is showing unusual signs or symptoms, how can you tell whether these are caused by a pest or disease, nutrient disorder, weather conditions or something else? Some symptoms caused by these different factors are very similar and can be easily confused. Once the cause has been identified, it may be necessary to take steps to manage the problem. On the other hand, it might be something that you have no control over or is minor and does not warrant further action.

To start, you will need to carefully examine the affected plants as well as those around them and look at the distribution of the symptoms. Check the leaves, including those that are just opening, for symptoms. Examine the outside of the stalks for obvious signs of damage, side shooting or other abnormalities before slicing them open to check the spindle, growing point and other stalk tissue for damage. Make a note of the condition of the roots. If the symptoms don't match those of the better-known pests or diseases (see SASRI Pest and Disease Guide) then look for other signs that might help with your diagnosis.

Factors such as the incorrect use of chemicals, soil conditions, nutrient deficiencies or toxicities and extreme weather conditions could be the cause of the symptoms if they:

- developed all at once and no further development can be seen,
- occur uniformly over the entire field,
- occur in distinct and regular patterns in the field e.g. along the field edge, along the cane row, in low lying areas,
- occur in a regular pattern on the plant, developing in the same position on leaves of a similar age or stalks across the field or in a section of the field,

- occur in neighbouring fields planted to different varieties, and/or
- also occur on broadleaf and grass weeds in and around the field.

Insect pests, nematodes and diseases could be the cause of the symptoms if they:

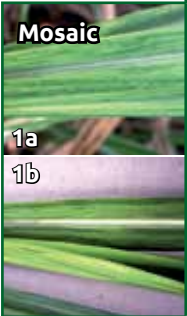





- are localised within the field,
- affect plants at random,
- start in one area and gradually spread to surrounding areas, with a change in severity over time,
- are persistent with new growth also showing symptoms, and/or
- affect specific varieties in different fields.






To help with the diagnosis, it's important to gather information on recent activities in and around the affected area (e.g. herbicide application, chemical pruning of verges, ripening) as well as unusual environmental conditions (e.g. extremely high or low temperatures, persistent rain, drought, lightning, hail, temperature inversions). Soil and leaf samples can alert you to nutrient, pH and nematode problems.

While these are standard guidelines for distinguishing environmental disorders from pest and disease symptoms, there are some instances where they don't necessarily apply e.g. rust or thrips symptoms may be seen across an entire field, nematodes and certain root pathogens can affect a wide range of varieties, while some varieties are more prone to environmental stresses than others. The symptoms or signs observed may not be specific enough to diagnose the problem. Where there is doubt, ask your Extension Specialist or Biosecurity Officer to advise. It may be necessary to send plant and soil samples to SASRI for further analysis.

For a quick guide on how to identify the most common cane abnormalities, see the pull-out table on the next page.



	Symptoms	Distribution	Action
Mosaic  <p>1a 1b</p>	Mottled, pale green leaves with dark green islands (1a) or vice versa (1b) with margins that are not clearly defined. Affected plants may have a general yellow appearance. Easier to see on young leaves and at the leaf base.	Usually in patches or on individual plants. May be more common on the field edge when introduced by aphids.	An important disease that requires management.
Maize streak 	Striking and distinct white streaks on the leaf and sometimes the leaf sheath. Symptoms are easily seen across the entire leaf surface, from base to tip.	Usually on individual plants or in patches. May be more common on the field edge when introduced by leaf hoppers.	An important disease that requires management.
Herbicide injury 	Stunted growth. Leaf whitening and scorching. May see signs of chemical splatter.	Usually presents in a regular pattern e.g. along the field edge, along the row.	If severe, check chemical mixes, dosage and application methods.
Pokkah boeng 	Mild (cosmetic) whitening and crinkling of the leaf. Common on certain varieties in summer when growing conditions are favourable.	Usually in patches or on individual plants. If symptoms are present in a regular pattern (e.g. along the field edge, along the row), this probably indicates herbicide (e.g. glyphosate) or ripener injury.	Pokkah boeng may develop further and affect growth (see SASRI Pest and Disease Guide for more severe symptoms) but generally disappears without causing much yield loss.
Chlorotic gumming 	White areas, usually lightly speckled with red streaks. Not common but may be seen in summer on some varieties.	Usually in patches or on individual plants.	Contact your Extension Specialist or Biosecurity Officer to confirm that it isn't leaf scald.
Leaf scald 	Narrow, white lines running along the veins, from the leaf edge towards the midrib. Stripes broaden and become less defined as leaves mature. Other symptoms include leaf whitening, scalded leaf tips with edges curling inwards, basal side shoots, sudden stalk death.	Usually occurs in patches or on individual plants.	An important disease that requires management.

	Symptoms	Distribution	Action
 Chimera	Well defined white stripes on the leaf blade with distinct (not diffuse) edges. Whole shoots may be white. Usually genetic but may be induced by some herbicides.	Usually on individual plants. May occur in patches if herbicide-induced.	Generally disappears without causing much yield loss. If more than one or two shoots are affected, contact your Extension Specialist or Biosecurity Officer to establish that the symptoms are not that of a disease.
 Thrips damage	Yellow to white diffuse patches on open leaves, often with red streaks. In young cane, leaf tips may be tied together; in older cane tips are white, dry and twisted. Check for thrips by unrolling the spindle leaf.	May affect the entire field.	Contact your Extension Specialist or Biosecurity Officer to discuss possible management options
 Iron or manganese deficiency	Yellow interveinal striping on younger leaves. Iron deficiency - striping is usually from the tip to the base of young leaves, the whole plant may turn yellow. Manganese deficiency - striping is usually from the tip to the middle of the leaf.	Usually presents as patches in the field	Symptoms will often disappear over time. Take soil and leaf samples if severe.
 Banded chlorosis	Well defined, horizontal white to yellow bands on the leaves occurring on both sides of the midrib. Bands will be in similar positions on leaves of a similar age on affected plants. Caused by sudden and extreme temperature changes.	Usually affects large areas of the field. Some varieties are more sensitive.	None required.
 Frost damage	Mosaic-like mottle to long, narrow, chlorotic stripes on the leaves. Entire leaf may whiten. Symptoms are similar on leaves of a similar age.	Uniformly across the field or in patches (low lying areas).	Contact your Extension Specialist for advice particularly if the growing point is damaged.

Crop nutrition in the current drought - for rainfed areas

Harvested cane

Where cane is harvested, and yields were below levels targeted in the fertilisation programme, it is likely that appreciable amounts of residual P and K remain in the soil for use by the current crop.

- K fertiliser rates may be reduced in proportion to the decrease in yield (from the 'normal' or targeted) of the previous crop. For example, if fertilisation for the previous crop was for a yield target of 100 t/ha, and only 50 t/ha was harvested, only 50% of the K requirement for a 100 t crop should be applied this season.
- With the majority of soils in the industry having adequate to excessive P reserves, reducing or eliminating P in nutrition programmes presents an opportunity for significant savings. Thus P-containing fertilisers should be applied only where soil test data indicate definite deficiencies.

Nitrogen management presents particular challenges.

- Some residual fertiliser N from the previous crop cycle may be available for the current crop, thus allowing for a reduction in N rates.
- Given the predicted uncertainty of rainfall for the current season, the splitting of N applications is most advisable. This should involve the application of 40 to 60% of the N requirement in the first half of the summer, with the remainder being applied in the January – March period, depending on rainfall up to that stage.
- A further consideration in terms of N management is the increased likelihood of volatilisation losses from urea in current weather conditions. Where surface application of urea or urea-containing blends is followed by small amounts of rainfall (<5 mm), and thereafter hot dry winds, volatilisation losses may be significant. To minimise N losses by volatilisation:

Urea should be applied in split applications as detailed above.

The urea should not be applied in a narrow band, as this will accelerate losses.

Alternative N fertilisers with lower N volatilisation potentials should be considered.

Carry-over cane

Assuming that crop P and K needs were applied at the initiation of the crop cycle, management of N is all that needs consideration from a nutritional perspective.

- 30 to 50 kg N/ha should be applied early in the current season. Depending on rainfall, more N may be warranted in mid to late summer.
- The considerations relating to minimising volatilisation losses described above should be borne in mind.



by Neil Miles
(Senior Soil Scientist)



Gewas voeding vir die huidige droogte-toestande in droëland areas

Geeste riet

Waar riet geoes is en opbrengste laer is as die teiken opbrengs bemestingprogram, is daar heel waarskynlik genoegsame vlakke van residuele P en K in die grond vir die huidige oes.

- K bemesting vlakke kan verlaag word in verhouding met die afname in opbrengs (van die normale of teiken) van die vorige oes. Byvoorbeeld, indien bemesting vir die vorige oes 'n teiken opbrengs van 100 t/ha gehad het maar net 50 t/ha is geoes, moet net 50% van die K behoefte vir 'n 100 t/ha oes in die huidige jaar aangewend word.
- Met die meerderheid grond in die industrie wat voldoende of oormatige P reserwes bevat, bring die verlaging of eliminasië van P bemesting beduidende moontlike besparings. P bevattende kunsmis moet slegs aangewend word waar die grondontledingsdata definitiewe tekorte aandui.

Stikstof bestuur stel spesifieke uitdagings:

- Residuele N kunsmis van 'n vorige oessiklus mag beskikbaar wees vir die huidige oes en kan dus 'n verlaging in N vlakke teweeg bring.
- Gegewe die onvoorspelbare reënval van die huidige seisoen word die verdeling van N toedienings aanbeveel. Dit bring teweeg dat 40% tot 60% van die N aanbeveling in die eerste helfte van die somer aangewend moet word, met die oorblywende gedeelte wat

gedurende Januarie – Maart aangewend word afhangend van die reënval op daardie tydstop.

- 'n Verdere oorweging in terme van N bestuur is die toenemende waarskynlikheid van vlugtige verliese van urea in heersende weerstoestande. Waar oppervlak toediening van urea of urea bevattende mengsels gevolg word deur lae reënval (< 5 mm), en daarna deur warm droë winde kan die vlugtige verliese beduidend wees. Verminder N verliese deur vervlugtigting:

Verdeel urea aanwendings soos beskryf hierbo.

Urea moet nie in 'n nou band aangewend word nie aangesien dit verliese sal bespoedig.

Alternatiewe N bemestingstowwe met laer vervlugtigingspotensiaal moet oorweeg word.

Oordragriet

Indien gewas P en K behoeftes aangewend is met die oessiklus ontwikkeling moet slegs die bestuur van N aandag geniet ten opsigte van 'n voedings perspektief.

- Dien 30 tot 50 kg N/ha toe tydens die vroeë seisoen. Afhangende van reënval mag daar 'n verdere behoefte wees aan 'n N toediening in die middel tot laat somer.
- Die aanbevelings ten opsigte van die vermindering van vlugtige verliese soos hierbo beskryf, moet in aanmerking geneem word.

Advies besikbaar

FAS

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

Hoe gemak met die wisselvalligheid in grondmonsters?

Indien 'n suikerboer vir drie verskillende kunsmismaatskappye sou vra om 'n spesifieke land se grond te ontleed, sou die variasie in toetsresultate en gevolglike aanbevelings dikwels hemelsbreed van mekaar verskil. Die rede hiervoor is dat natuurlike variasie in grondvrugbaarheid in die meeste landerye voorkom en gevolglik is die neem van verteenwoordigende grondmonsters gewoonlik ook 'n redelike groot uitdaging. Hoe oorkom ons hierdie probleem?

Eerstens moet die grondmonsternemingsproses baie streng en sistematies beheer word:

- 'n Beater grondboor moet gebruik word om te verseker dat 'n konstante diepte gehandhaaf word. Plantvoedingsaanbevelings word

gebaseer op die bogrond (0-20 cm) en grondmonsters wat dieper of vlakker geneem is, sal lei tot onakkurate resultate.

- Elke grondmonster wat na die laboratorium toe gestuur word moet opgemaak word uit ten minste 30 sub-grondmonsters. Hierdie grondmonsters moet met 'n sistematiese heen-en-weer patroon, versprei oor die hele land, versamel word.



- Elke saamgestelde grondmonster moet geneem word van 'n univorme grondtipe nie groter as 5 ha nie. Grondvrugbaarheid van laerliggende gebiede sal byvoorbeeld verskil van die van grond hoër op teen die helling binne dieselfde land.

Die tweede strategie om die impak van variasie te beperk en wat dikwels oor die hoof gesien word, is om aanbevelings te baseer op langtermyn neigings eerder as op enkele grondtoetsresultate. Hierdie is 'n sleutelstrategie om doeltreffende bestuur van plantvoeding te optimaliseer.

Vir hierdie rede is dit noodsaaklik dat rekord gehou word van alle grondtoetsresultate op sigblaie (spreadsheets) vir die ontleding van langtermintendense. Hierdie inligting sal help om enige onbetroubare resultate uit te wys asook help om ingeligte besluite te neem rakende toekomstige kunsmisaanbevelings.

Met betrekking tot die gebruik van 'standaard' mengsels...

Om gerieflikheidshalwe word standaard kunsmismengsels dikwels op alle landerye op 'n plaas toegedien ongeag die spesifieke grondtoetsresultate. Hierdie praktyk vergemaklik nie net die bestelling van kunsmis nie, maar daar is ook minder moeite betrokke tydens die toedieningsproses. Ongelukkig is hierdie benadering tot kunsmistoediening oneffektief en onekonomies op die langeduur.



Beskou die volgende voorbeeld waar 'n boer 'n standaard kunsmismengsel, wat 120-25-120 (N:P:K) bevat op alle landerye van 'n 250 ha plaas toedien. Indien slegs 'n klein aantal lande P benodig, wat dikwels die geval is, sal die P toediening op die oorblywende lande onnodig wees en ook geen impak hê op opbrengs nie. In hierdie voorbeeld het 200 ha geen P benodig nie, wat beteken dat die onnodige uitgawe aan P alleen ongeveer R165 000 beloop. Die teendeel is ook natuurlik ook waar. Ondervoorsiening van voedingstowwe soos N en K kan lei tot ernstige verliese aan inkomste as gevolg van 'n verlaging in opbrengs.

Probleme met die verskaffing van inligting ...

FAS ervaar dikwels probleme met grondmonsters wat ingedien word sonder enige dokumentasie of vorms wat verkeerdlik of onvolledig ingevul is. As gevolg hiervan, word ontledings dikwels vertraag en kan

dit ook lei tot foutiewe aanbevelings in die laboratoriumverslag. Met laasgenoemde in gedagte moet die volgende riglyne gevolg word wanneer grondmonsters ingedien word:

- Alle grondmonsters moet vergesel word van 'n indieningsvorm met die presiese identifikasie van die grondmonster (byvoorbeeld die landnommer) aangedui op die vorm.
- Daar is verskillende indieningsvorms vir verskillende ontledings (byvoorbeeld blaar, grondvrugbaarheid, versouting, water en kunsmis).
- In die geval van grond- en blaarontledings, het die inligting wat op die vorm verskaf word 'n groot invloed op die kommetaar wat op die ontledingsverslag sal verskyn. Byvoorbeeld, in die geval van grondvrugbaarheid, is die 'Attainable yield' (haalbare opbrengs) inligting krities aangesien dit gebruik word vir die berekening van N en K behoeftes van die plant.



Vir meer inligting, raadpleeg asb. die volgende inligtingstukke, almal beskikbaar op die 'InfoPack DVD':

- Die video, 'Soil Sampling'
- Die boek, 'Understanding and Managing Soils in the SA sugar industry'
- SASRI Inligtingstukke



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Training your pest and disease scouts

The losses incurred from pest and disease incursions can be devastating and most often, these incursions are unanticipated. It is therefore vitally important to monitor your fields frequently, over and above the pest and disease surveys conducted by SASRI Biosecurity teams. Your farm staff should be trained to scout out potential threats as well as identify and keep track of the most important ones (such as eldana, mosaic and smut). This proactive approach ensures that these threats are identified and treated before they get out of control. It also assists with the timely planning of your pesticide and herbicide spray programmes. In addition, these trained staff can help inform the local biosecurity teams as to where the pest pressures may be and ensure surveys are prioritised in the areas they are needed the most. Trained staff should generally be people with some kind of supervisory role on the farm who have extra exposure to fields throughout the growing season.

In Umfolozi, SASRI Extension Specialist/P&D Officer, Alex Searle (along with his Biosecurity Team) recently held a P&D training course to educate farm staff in the area. Approximately 60 staff members from the local farms attended the training so that they could become effective pest and disease 'scouts'. Due to the good response from the local growers, the group had to be split and training was held on two separate days.

"Thank you for a great initiative, it is extremely valuable to have extra eyes on the ground, especially with the climatic conditions we are currently experiencing".

Grant Harrison, Local contractor and grower

The courses were conducted in isiZulu and covered a number of topics:

- Identifying eldana and other borers.
- Conducting eldana field surveys (identification of frass, splitting stalks and calculating stalk damage by measuring percentage stalk length red).
- Identifying varieties and off types.
- Identifying smut infected stools.
- Roguing procedures for smut and off-types.

The topics elicited many questions and valuable discussion from the attendees, and the interactive format of the course ensured that there was useful knowledge sharing between the scouts and the SASRI Biosecurity Team.

Similar training events take place regularly throughout the industry and this forms part of the Biosecurity programme of work. Contact your Biosecurity Officer to arrange training you may require.



by Kerisha Raghunandan
(Publications Officer)

"My staff have been roguing for smut in NCo376. Since attending the course, they are now removing smut stools that haven't yet shown a whip - so the course was very beneficial. I only had three staff members attend this time, but I will send the whole team for the next course".

Jon Wiseman, Local Grower Council Chairman



Alex Searle would like to acknowledge Coastal Farmers, Aquifer Water, Umfolozi Sugar Mill (Pty) Ltd and Jock Morrison and Sons for the refreshments and Information Packs.



Weed management under dry conditions

Due to the dry conditions earlier in the season and resulting slow growth of the cane it is possible that there will be a lot of mature weeds (e.g. *Panicum* and *Sorghum species*) that have escaped earlier treatments. To minimise the threat of further spread:

- Ensure that sufficient staff are available to hand-hoe large weeds that escaped earlier chemical treatment.
- Stools of mature weeds should be removed from fields to prevent the possibility of regrowth and seeding.
- Alternatively, apply a registered "knockdown" treatment that normally includes MSMA where mature grass weeds predominate or paraquat + surfactant where mature broadleaf weeds are the major problem.

- Follow up with hand-weeding.
- Applying strong herbicides can be damaging to cane so use shielded or directed sprays.

How to minimise the spread of creeping grasses like *Cynodon*

- For low to medium levels of infestations in fields, apply shielded spot-sprays of glyphosate or paraquat + diuron/surfactant onto the grass patches under the crop canopy making sure to spray all visible grass runners and avoiding cane leaves.
- For in-field patches where there is no cane, apply repeated full cover sprays of glyphosate to the grass once it is green enough to spray.

- For verges and breaks, use mechanical mowing but in addition, apply either paraquat + diuron/surfactant, or glyphosate along the edges of the fields in order to stop grasses spreading from the breaks into the field. Make sure that you direct the spray away from the crop.

NB: take extra care where imazapyr has been used on breaks and verges as this chemical can be particularly harmful to cane in dry seasons.

- For fallow or abandoned fields, treat creeping grasses as above and separately from the other weed types present in these fields.



Peta Campbell
(Scientist: Weed Control)

Yield responses of varieties to mulching in the coastal region



by **Sanesh Ramburan**
(Crop Scientist: Variety Evaluation)

Recent results from a mulching vs burning trial in the Empangeni area have demonstrated the massive yield improvements that are possible with the retention of crop residues as a mulch layer.

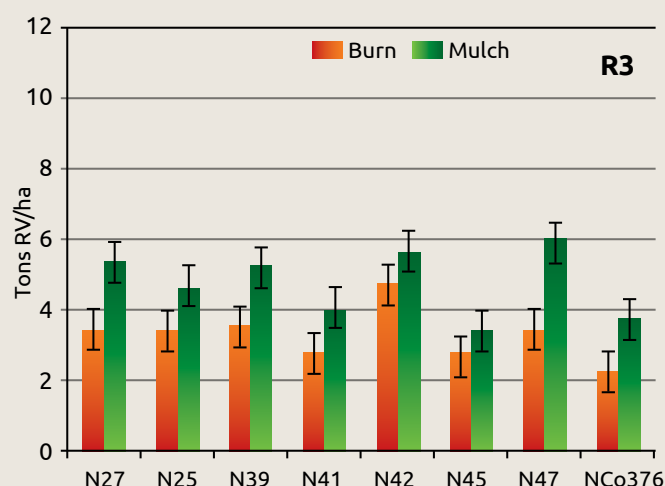
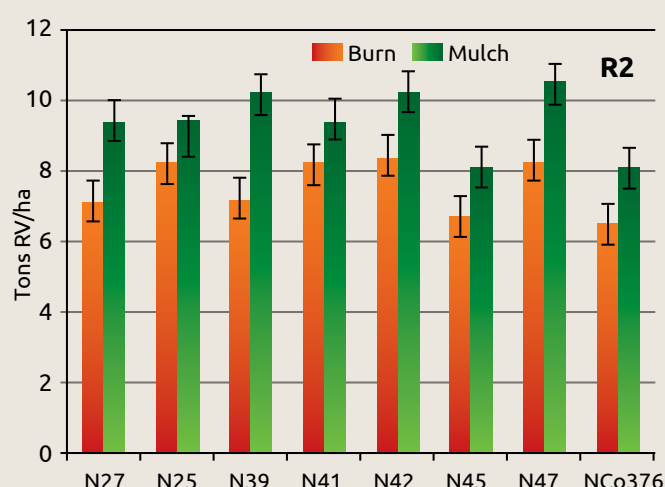
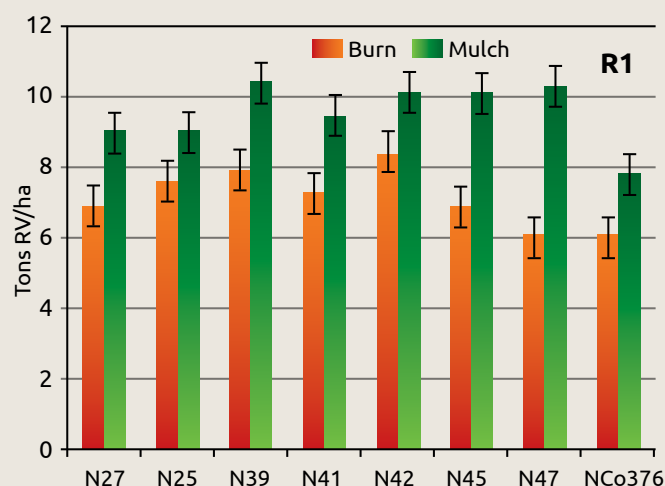
The trial was established in 2008 in response to grower perceptions about poor ratoon regrowth and yields with some varieties when mulched. The trial consisted of eight popular varieties from the Felixton mill supply area, which were either burnt or mulched at harvest over a period of three ratoon crops, harvested annually in October under rainfed conditions.

The graphs show that RV yields of all eight varieties were significantly improved when mulched in the first, second, and third ratoon crops. The yield benefits of mulching ranged from 0.6 tons RV/ha (N45 in third ratoon) to 4.3 tons RV/ha (N47 in first ratoon). Clearly, no variety showed a negative yield response to the residue layer.



The picture shows growth differences between burnt and mulched treatments.

Figure 1 (right). RV yields of eight varieties grown at Empangeni and either burnt or mulched at harvest over three ratoon crops (R1, R2 and R3) that were harvested annually in October.



The crops mentioned on page 22 were ratooned through the mulch layer during summer months. To test the effects of ratooning through winter, the fourth ratoon crop was cut back in July to bring the trial into a 'winter cycle'.

The figure on the right shows the RV yields of the fifth ratoon crop (July to July cycle). Once again, all varieties showed massive yield responses to mulching, and no varieties were negatively affected.

The sixth ratoon crop of this trial was severely affected by drought, which caused ratoon failure in the burnt treatments while the mulched treatments produced a salvageable yield (picture below).

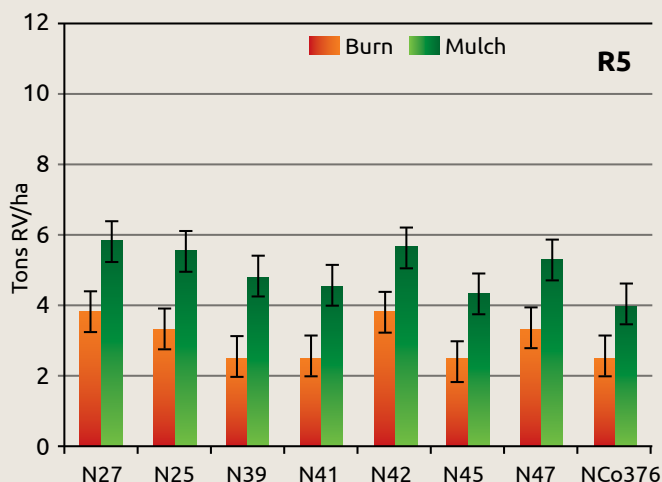


Figure 2. RV yields of eight varieties grown at Empangeni and either burnt or mulched at harvest in a fifth ratoon crop that started in July.



A burnt strip of eight varieties (right) compared with a mulched strip of the same eight varieties (left) during the 2015 drought (crop age = 7 months).

The crops harvested from this trial, as well as the numerous trials conducted over the years show quite clearly that the rate of tillering and time to canopy closure are delayed with a mulch blanket compared with a bare surface. However, these differences tend to disappear, and no differences in stalk population are observed between burnt and mulched

treatments at harvest. The benefits of mulching seem to lie with the retention of soil moisture, which ensures continual stalk elongation during dry periods compared with bare surfaces. Growers should therefore not be discouraged by the slower ratoon regrowth through a mulch blanket, as this is expected.

Growers along the coast are encouraged to implement green cane harvesting and residue mulching as a standard management practice under their marginal growing conditions. The potential RV yield benefits shown here must also be considered in light of the various other benefits of mulching, as highlighted in the article on page 6.

Weather

Review

The industry remains gripped by a very serious drought. Rainfall in recent months remained well below normal for all regions (Figure 1). Except for the unusually high rainfall experienced in July 2015, monthly rainfall totals in dryland production areas have been below normal since April 2014 (Figure 2) and rainfall totals over the period April 2014 to November 2015 (Table 1) are amongst the lowest ever recorded.

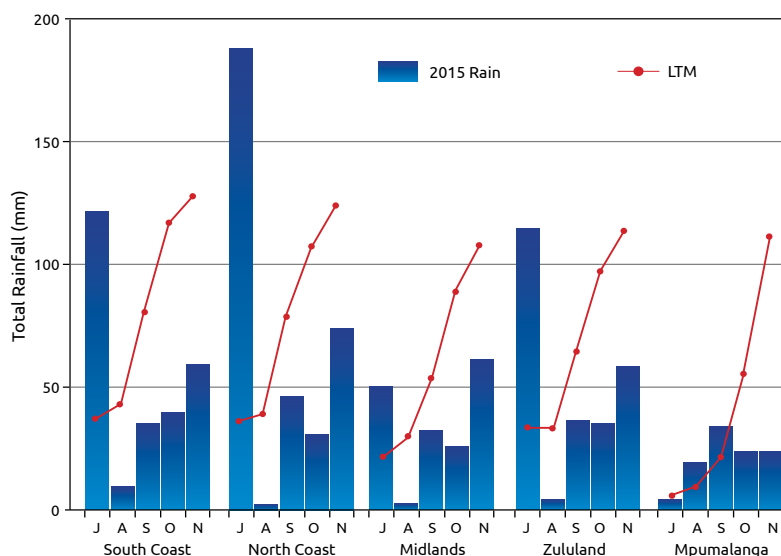
The prolonged and widespread lack of rain has caused severe yield losses in the 2015 rainfed crop and will also negatively impact 2016 yields. It also caused critically low irrigation water supplies in Pongola, Umfolozi and Felixton areas, with no water for irrigation since November 2015.

Outlook

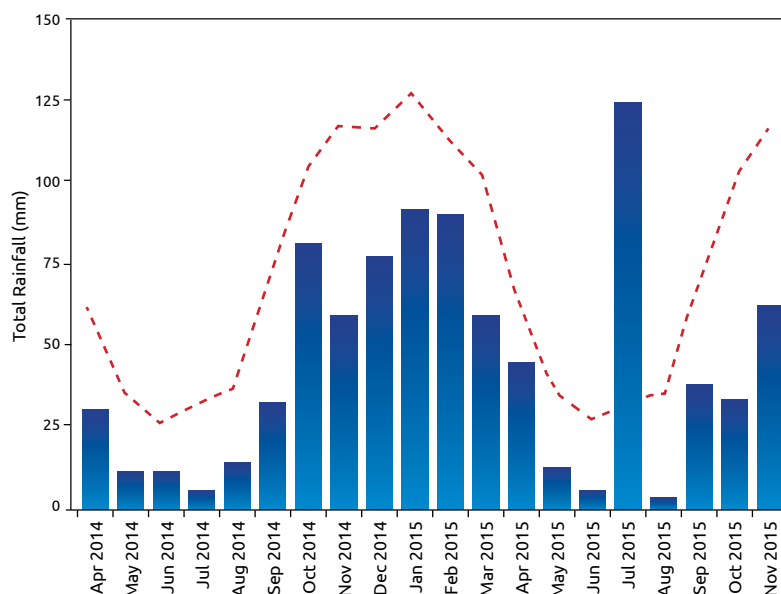
Below normal rainfall and above normal temperatures are expected to continue through the summer months of 2015/16. The El Niño-Southern Oscillation (ENSO) system is in a very strong El Niño phase that is expected to last through to March 2016. El Niño is associated with higher probabilities of below normal summer rainfall (December to March) over eastern parts of South Africa, including the sugar belt. The South African Weather Service (SAWS), the International Research Institute for Climate and Society and the European Centre for Medium-Range Weather Forecasts all predict strong chances of below normal rainfall for this period, with warmer than normal temperatures, across the industry.

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.

Region	Total Rain (mm)	LTM Rain (mm)	Percent of LTM (%)
South Coast	960	1549	62
North Coast	989	1535	64
Midlands	803	1222	66
Zululand	804	1378	58
Mpumalanga	774	1019	76
Industry	864	1362	63



(Above) Figure 1. Regional average monthly total rainfall and the monthly long term means (LTM) for July to November 2015.



(Above) Figure 2. KwaZulu-Natal average monthly rainfall since April 2014 (bars) compared to the monthly long term mean (broken line).

(Left) Table 1: Regional and industry average total rainfall for the past 20 months (April 2014 to November 2015) compared to the long term mean (LTM) rainfall for the same period.



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

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