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The Link

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In this issue...

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Dealing with a NEMATODE PROBLEM

The presence of nematodes is a widespread problem throughout the SA sugar industry. They can cause serious damage to the roots of sugarcane, particularly in sandy soils. This results in a reduction in yield of the affected crop as well as a reduction in the number of high yielding ratoons from one planting. The estimated cost to our industry is 1.6 million tons cane (approximately R450 million) per annum.

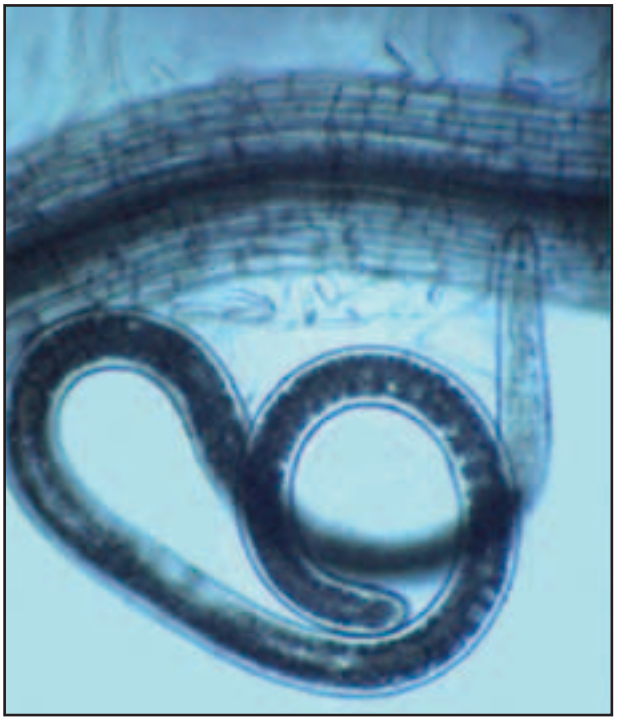
The first step in combating this problem is the early detection of the pest through soil sampling. SASRI offers a nematode sample analysis service at the cost of R110 (excl. VAT) per sample. Soil sampling is necessary because:

- It is the most accurate way of detecting nematode problems.
- Nematodes are microscopic, and thus cannot be seen with the naked eye.
- Symptoms of damage on cane roots (galls and stubby roots) are not always easily visible.
- Aboveground symptoms (open canopies, stunted growth, uneven tillering) can also be caused by other problems e.g. nutrient deficiencies, water stress and thus the effect of nematodes are often overlooked.

The following fields should be sampled for nematodes:

- Fields showing aboveground symptoms and with previous history of nematode damage.
- Sandy soils (<20% clay).
- Where a continued or dramatic yield decrease has been noticed.

Continued on Page 2



Please consider the following when sampling for nematodes:

- Remember that nematodes occur in the soil and roots, so always include both in the sample bag. Ensure that you collect the soil and roots from the area next to a sugarcane stool.
- Collect at least 5 samples per field and place into a plastic bag. At least 1 cup of soil per sample is needed for analysis. Follow the FAS procedure for soil sampling if no plants are present.
- Nematodes are living organisms, so avoid dropping samples or throwing bags. Also, being aquatic organisms, nematodes need some moisture in the soil to survive. Therefore, ensure that the bags are sealed to prevent the soil from drying out. Make sure that the samples reach the SASRI laboratory as soon as possible (within 3-4 days).
- Use the newly designed sample labels (*see below*) which must be attached to the sample bags. The new labels can be collected from your local Extension Specialist or from the Nematology section at SASRI. The back of the label provides information on which fields to sample, when to sample, how to sample and some other useful tips.
- Samples can be sent through the FAS collection system (please mark them clearly 'For Nematology') or alternatively dropped off at the SASRI reception.

For further enquiries please contact
Shaun Berry (Nematologist) on 083 709 5810 or 031 508 7531,
or Prabashnie Ramouthar (Assistant Research Officer)
on 031 508 7522

Message from the Director

Dr Carolyn Baker

Launching the new FAS package has taken far longer than we could ever have anticipated. However, in order to verify the new analytical methods, results and associated recommendations, and to be completely sure that the systems were reliable and robust, additional time was required by the laboratory team and associated specialists. At the beginning of August, the lab 'switched' to the new systems and by now you will be aware that the SASRI team is conducting a roadshow throughout the industry to enable all growers to learn first-hand about the changes and improvements. Should you be in any doubt about any aspect of the new FAS, your local Extension Specialist will assist you.

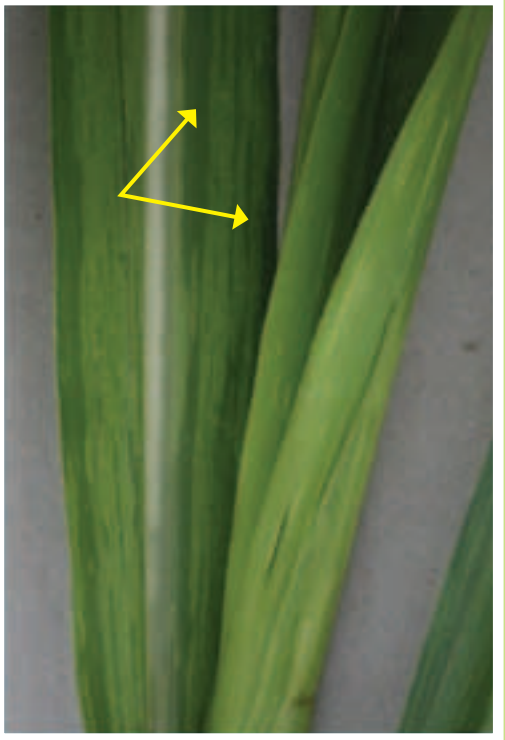
Since delivering services to the industry is core to our business, it is not surprising that the most significant distinguishing feature of SASRI that separates it from all other service providers relates to its dedicated focus on sugarcane agriculture. It is for this reason that our specialists are at pains to ensure that all technical advice is very carefully researched before it is issued to growers. We are regularly asked to provide definitive advice and recommendations that enhance grower's productivity and practices – and endeavour to meet this need whenever possible. There are times however, where we simply require more information and additional research to deliver the best advice – and we recognise how frustrating this delay in provision of information must be for the recipients. One thing is certain however – that SASRI specialists will always convey the full extent of their knowledge with full consideration of its consequences, and the adage of 'under promise and over–deliver' is one that is keenly practiced in the SASRI environment.

MOSAIC

Check your seedcane sources

Mosaic is a problem in many parts of our industry. It is therefore important for you to check all seedcane sources routinely to ensure that they are free from the disease. The characteristic symptoms are a mottled leaf colouring with dark green islands on a pale green background (see pictures). These symptoms are not always obvious – it is best to inspect actively growing cane that is younger than six months, and to look at the younger leaves and the leaf base, where the symptoms are usually most visible.

In most areas, the acceptable mosaic threshold in seedcane has been set at between 0.1 and 0.5% stools infected. Depending on circumstances, roguing is recommended at mosaic levels of up to 2% but when levels exceed this, you should look for an alternate source of seedcane. Be sure to re-inspect your seedcane sources to ensure that the roguing operation has successfully reduced mosaic levels to below the acceptable threshold for your area.



Symptoms of mosaic: leaf colouring is mottled, usually showing dark green islands on a pale green background.

FACTS ABOUT MOSAIC

- When severe, yield losses can be as high as 30% in susceptible varieties.
- Mosaic is one of the most difficult diseases to manage once a field becomes infected because it has a range of alternate hosts (e.g. wild grasses and maize) and is spread by insect vectors (aphids).
- Once sugarcane is infected with mosaic, it **CANNOT** be cured through hot water treatment or chemicals. Novacane® plantlets are an important source of disease-free seedcane.
- The only effective long-term solution to mosaic is the planting of resistant varieties.

By Sharon McFarlane (Senior Plant Pathologist) and Rowan Stranack (Biorisk Manager)

How Important is Variety Choice to RATOONING ABILITY?

The ability of a crop to sustain RV yields over many ratoons is referred to as ratooning ability. Due to the high cost of replanting, it is generally acknowledged that a variety with a good ratooning ability will be more profitable. Ratooning ability must not be confused with speed or vigour of re-growth after harvesting. For example, a crop may germinate and form a canopy relatively slowly after harvesting, but still be able to sustain high RV yields over many crops. A good example is N12 which has this type of growth pattern (slow germination and canopy, but good ratooning ability in general).

There sometimes appears to be a perception that newer varieties have poor ratooning ability compared to the older varieties such as NCo376. There is absolutely no scientific evidence to support this belief. This misconception may have arisen from:

- the placement of new varieties in poor fields relative to the continued cropping of NCo376 on better fields;
- reduced management inputs over the last few years coinciding with the planting of new varieties;
- the failure to distinguish between early ratoon re-growth and actual ratooning ability; and
- an over-reliance on variety as a "silver bullet" to mitigate all production limitations.

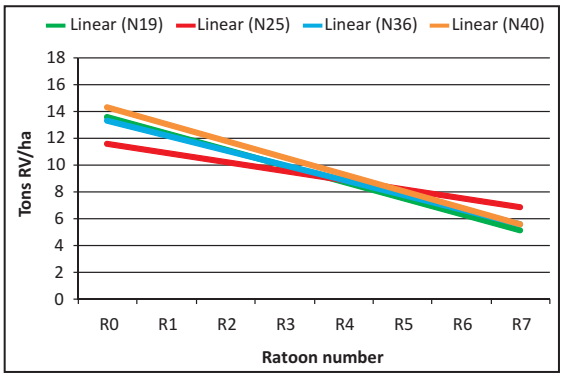
While varieties do differ in their ratooning ability, **environmental conditions** and **management practices** have a far greater impact on ratooning patterns. The results from five long-term variety trials clearly demonstrate this.

Each trial produced a unique ratooning pattern that was dependent on the differences in environmental conditions and management practices. Varieties did show differences in ratooning, but the differences were minor, and confined within the general patterns for each trial. If ratooning ability was more dependent on variety, then some varieties would show completely different patterns within a trial, and this is clearly not the case.

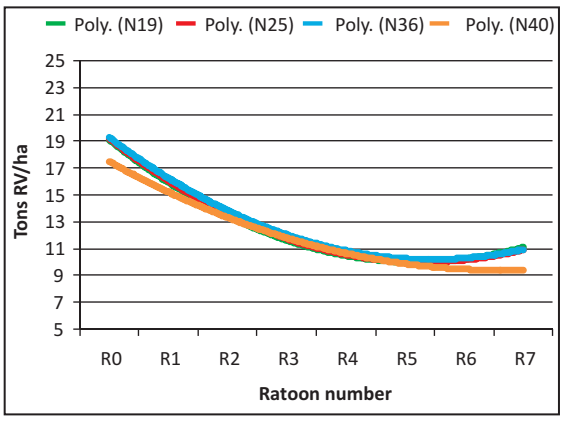
Growers can therefore make more progress in sustaining yields by improving management practices rather than trying to select varieties based on their "perceived" ratooning ability.

TRIAL DETAILS

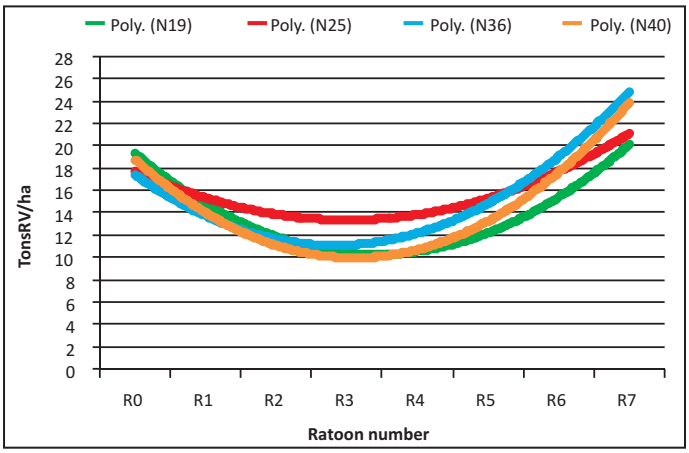
Irrigated Trials



Trial 1: RV yield trends of four varieties harvested over eight crops in Pongola. The trial was established on a shallow soil with overhead irrigation. Management was poor (prolific weed growth in particular). The figure shows that all four varieties showed a linear decline in RV yields as ratoon number increased. N19, N36 and N40 showed a similar rate of decline (parallel lines), while N25 showed a slightly flatter line, suggesting that under these conditions, it may sustain RV yields for slightly longer compared to the other varieties i.e. it has better ratooning ability.



Trial 2: RV yields of four varieties harvested over eight crops in Pongola. The trial was on a good soil with drip irrigation, and with better management than Trial 1. Here, RV yields of the four varieties declined more gradually compared to the previous trial, and also showed a degree of leveling off in the later ratoons. All four varieties showed similar rates of decline, even N25.

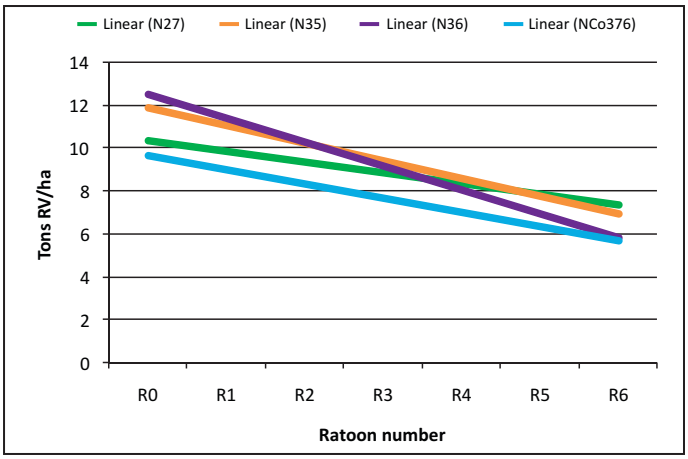


Trial 3: RV yields of four varieties harvested over eight crops in Komatipoort. The trial was on a good soil with drip irrigation, and farm management was changed after the 4th ratoon.

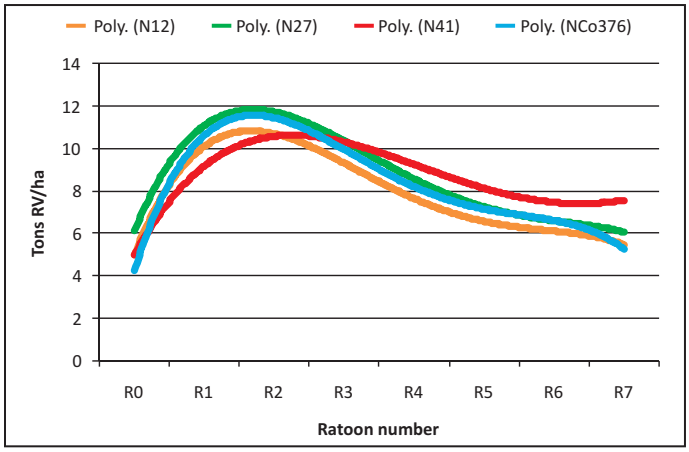
Yields declined until the 4th ratoon and then showed a gradual increase until the 7th ratoon. This unusual response was attributed to improved management practices after the 4th ratoon, when recommended irrigation scheduling practices were implemented, improvements were made to the irrigation system (blocked dripper lines were replaced), and more emphasis was placed on trial fertilisation based on FAS recommendations.

Once again, all varieties showed a similar trend with slight variations from one variety to the next (note the improved performance of N36 relative to N25 at later ratoons despite the common perception that N36 is a poor ratooning variety under irrigation).

Rainfed Trials



Trial 4: RV yields of four varieties harvested annually over seven crops under rainfed conditions at Empangeni. The trial was on a good soil and was burnt at each harvest. The varieties in this trial also showed a linear decline in yield as ratoon number increased. All varieties responded similarly and showed slight differences in the rates of yield decline. N36 showed the fastest rate of decline, N35 and NCo376 showed similar rates of decline, while N27 produced the flattest line, suggesting that it had the best ratooning ability under these conditions.



Trial 5: RV yields of four varieties harvested over seven crops under rainfed conditions at Scottburgh. The trial was on a shallow, sandy soil, and was trashed at each harvest. In this trial, yields increased up to the 2nd ratoon and thereafter showed a very gradual decline to the 7th ratoon. Once again, all varieties responded in the same general pattern, with slight deviations between varieties. N41 produced lower yields than the other varieties up to the 3rd ratoon, but outperformed the other varieties in all subsequent ratoons, suggesting that it has good ratooning ability.

SUMMARY

The results from the trials highlight some important aspects of ratooning ability and the role of varieties in sustaining yields. In summary, the following are some important points to remember when dealing with ratooning issues:

- **Environmental conditions** and **management practices** are the most important factors affecting ratooning ability, as they determine the overall ratooning pattern.
- Variety only affects the variability within a particular ratooning pattern. The variation from one variety to the next is minor in comparison to the variation from one ratooning pattern to the next.
- Growers can therefore make more progress in sustaining yields by improving management practices rather than trying to select varieties based on their "perceived" ratooning ability.
- Older varieties such as NCo376 are not necessarily better ratooning compared to new varieties, as shown in Trial 4 (N27 showed better ratooning ability than NCo376) and Trial 5 (N41 showed better ratooning ability than NCo376) above.
- The speed and vigour of regrowth after harvesting must not be confused with ratooning ability. Some varieties may re-establish themselves slowly after harvesting, but are still able to sustain RV yields over many ratoons.

By Sanesh Ramburan (Agronomist: Varieties)

Benefits from Chemical Ripening under commercial conditions in Pongola

VOORDELE VAN CHEMIESE RYPMAKING ONDER KOMMERSIËLE TOESTANDE IN PONGOLA

Opsomming: Pongola kwekers wil graag uitvind wat die ekonomiese dividende is wat onder kommersiële toestande uit chemiese rypmakers verkry kan word. Met dit ten doel is 'n kommersiële strookproef uitgelê op die plaas van Ernst Höll (SM Naude Boerdery) te Pongola. Opbrengsparameters in Fusilade Forte-bespuite en onbespuite stroke riet (3 ha per strook) binne drie aaneenlopende lande (N43 plantriet) is vervolgens met mekaar vergelyk. Lugtoediening van Fusilade Forte het op 8 Maart 2011 onder ideale weerskondisies plaasgevind. Visuele simptome van Fusilade Forte toediening, vernaamlik uitgedroogde blaarrolle en swart letsels met klein sylote op boonste jong litte, was sigbaar vier weke na bespuiting. Die afwesigheid van enige rypmakersimptome in die onbespuite strook riet is ook bevestig. Slegs 'n matige graad van afdroging is deur die kweker toegepas vanaf 2 – 3 weke voor oes. Die drie lande is gedurende Mei 2011 geoes, met rypmaker toediening-tot-oes periodes wat gewissel het tussen 8 en 11 weke. Tydens oes is al die rietvragte afkomstig van die rypgemaakteen onbespuite stroke getoets vir kwaliteit (RV%) en geweeg sodat riet- en RV-opbrengste (t/ha) bereken kon word. Die meerderheid van rietvragte afkomstig van die rypgemaakte stroke het 'n aansienlik hoër RV% behaal as riet afkomstig van die onbespuite strook. Slegs teen die einde van Mei was daar 'n geringe mate van oorvleuling, maar met die meerderheid van rypgemaakte rietvragte wat steeds die kwaliteitsverbetering vertoon het. In terme van opbrengs het die rypgemaakte stroke riet 3.1 ton RV/ha meer gelewer as die onbespuite riet, terwyl die verhoogde sapsuiwerheid wat terselfdertyd behaal is, ook die maaleienskappe van die riet verbeter het. Na aftrekking van totale produk- en toedieningskostes was die wins wat behaal is a.g.v. rypmaking R8 725/ha. Die resultate het verder aangetoon dat voordelige rypmakerresponse vir 'n paar weke na die optimum toediening-tot-oes periode steeds sterk behoue gebly het, heel waarskynlik vanweë die matige afdroging wat toegepas is. Hierdie resultate toon aan dat verbetering van rietkwaliteit m.b.v. rypmakers 'n baie winsgewende bestuurspraktyk is vir gebruik in Pongola op riet wat goed bestuur is en 'n hoë opbrengspotensiaal het.

A recent article in The Link (January 2011) showed the substantial economic benefit that chemical ripening of well-managed irrigated sugarcane crops in Komatipoort can deliver under commercial conditions. Considering the low cost of application, and the rapid return on investment, chemical ripening is a very profitable best management practice that growers in the Pongola area can also implement for improvement of cane quality in high-yielding sugarcane crops. SASRI and TSB are therefore promoting this practice in Pongola, especially for improvement of early-season cane quality. Pongola growers are, however, interested to know what economic returns can be achieved from chemical ripening under commercial (on-farm) conditions in their area.

Results from a recent strip trial conducted on Ernst Höll's farm (SM Naude Boerdery) in Pongola show that a profit in excess of R8 000/ha can be achieved from the correct application of chemical ripeners.

Choice of fields and crop age

Three neighbouring fields (fields 13, 14 and 15), covering an area in excess of 40 ha, were selected. All three fields were planted to N43 under overhead sprinkler irrigation during March 2010. Effective rooting depths across the whole area are

between 40 and 60 cm. At the time of ripener spraying the crop had eight or more green leaves with long upper internodes, indicative of vigorous growth essential for achieving good chemical ripener responses.

Ripener application

Fusilade Forte was applied on 8 March 2011 by fixed-wing aircraft at an application rate of 250 ml/ha in a water volume of 30 l/ha as specified on the product label. Ripener application occurred under sunny and calm conditions and was completed at 07h00.

A strip (3.2 ha) transecting the centre of all three fields where left unsprayed and was used as a control to determine chemical ripener responses achieved in two strips (3 ha each) situated above and below the control within the chemically-ripened part of the fields. Exclusion zones (at least 10 m wide) on both sides of the control strip prevented the risk of possible product drift confounding interpretation of results.

Observation of ripener responses

Four weeks after spraying, ripener symptoms characteristic of Fusilade Forte were clearly evident with wide-spread desiccation of spindle leaves and the formation of black necrotic rings and short side-shoots on the upper sections of the stalks. The absence of any ripener symptoms within the non-ripened strip was also established (*see photos below*).

Harvesting

The control (non-ripened) and chemically-ripened strips within fields 14 and 15 were harvested from 2 May 2011, 8 weeks following Fusilade Forte application. The remaining strips situated within field 13 were harvested from 26 May 2011, 11 weeks following Fusilade Forte application. For crops to be harvested in May, the recommended spray-to-harvest interval is 7 weeks, but due to cutting allocations and other factors the start of harvesting was delayed and exceeded the 7 week spray-to-harvest interval by between 1 (fields 14 and 15) and 4 (field 13) weeks. In all cases, drying-off (for the purposes of in-field harvesting practices) was not excessive and begun 2 – 3 weeks before harvest. The progression of drying-off was not interrupted by any significant rainfall events.

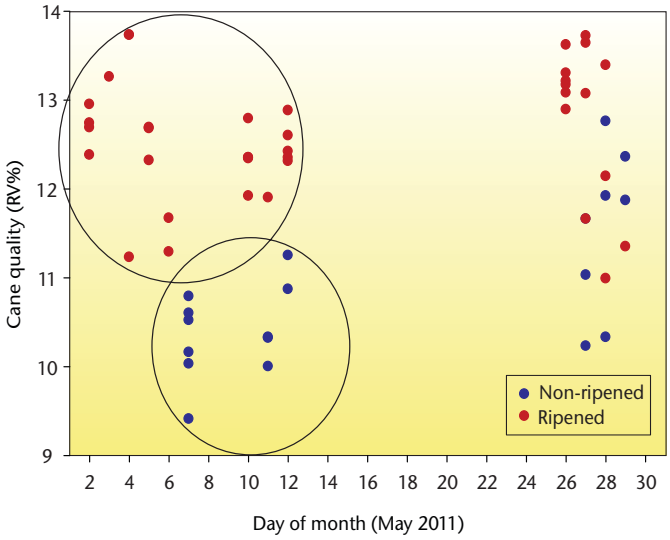


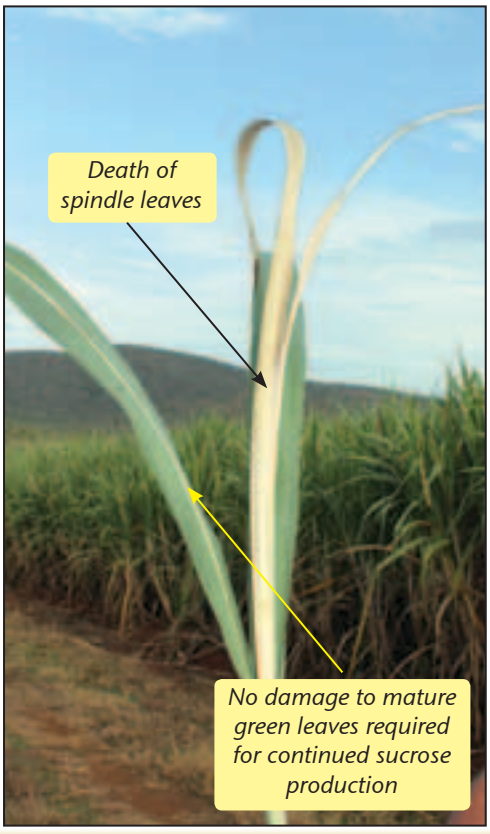
Figure 1. Cane quality (RV%) of each individual cane consignment.

Cane quality

During harvesting of the non-ripened and chemically-ripened strips, all cane consignments (58 in total) were analysed for cane quality (RV%) at the mill and both the cane and RV yields (t/ha) in each strip were calculated.

The quality (RV%) of the individual cane consignments are depicted in Figure 1. All chemically-ripened cane consignments (red dots) harvested from fields 14 and 15 outperformed the non-ripened cane consignments (blue dots) from the same two fields in terms of RV%. The clear separation is indicated by the two black circles on the graph. In the case of field 13, which was only harvested towards the end of May 2011, the majority of chemically-ripened cane consignments outperformed the non-ripened cane consignments in terms of RV%. However, there was some degree of overlap, most probably due to the natural increase in crop maturity over time in the non-ripened cane and the slightly longer drying-off period.

The results shown in Figure 1 also give an indication of how long positive chemical ripener responses could be maintained following spraying. As mentioned earlier, the recommended spray-to-harvest interval for crops harvested in May is 7 weeks. This implies that the maximum improvement in cane quality, triggered by Fusilade Forte, would have been achieved after that inter-



val. Under the specific conditions of the trial, the improvement in cane quality was maintained for up to 11 weeks after spraying, in a crop that was not dried-off severely, a factor known to erode positive ripener responses considerably.

Gains in yield parameters

Yield parameters achieved in the non-ripened (3 ha) and chemically-ripened (6 ha) strips across all three fields are provided in the table below. The cost of ripener chemical and aerial application was subtracted from the profit.

The improvement in RV yield across all three fields due to the application of Fusilade Forte was 3.1 t/ha. This response was driven by the large improvement in RV% and the absence of cane yield reduction due to chemical ripening.

Another benefit was the improvement in whole stalk juice purity, which would have improved milling performance.

The total cost (chemical + aerial application) of applying Fusilade Forte during 2011 at Pongola was R362/ha. However, with a subsidy of 75% from TSB, the actual cost to growers was only R90.50/ha. The profit (R/ha) achieved was calculated using the declared RV price for May 2011 which was R2 844. The **overall profit** achieved from using Fusilade Forte in these three fields was **R8 725/ha**.

These early-season on-farm results emphasise the substantial economic benefit that chemical ripening of well-managed irrigated crops can bring to the Pongola area and that these benefits, in the event of disruption of harvesting schedules, can be maintained for a couple of weeks beyond the optimal spray-to-harvest interval. This would be applicable to crops not exposed to severe degrees of drying-off. However, as best practice, growers should adhere as closely as possible to the optimal spray-to-harvest intervals and other recommendations published in the SASRI Information Sheets 12.1 - 12.3.

Treatment	Purity (%)	Moisture (%)	RV (%)	Cane yield (t/ha)	RV yield (t/ha)	Improvement in RV yield (t/ha)	Profit (R/ha)
Non-ripened	78.4	73.4	10.9	132	14.4	-	-
Ripened	82.5	72.6	12.6	139	17.5	3.1	8725

By Riekert van Heerden (Senior Scientist: Sugarcane Physiologist) and Marius Adendorff (Extension Specialist: Pongola)

Due to the very favourable winter rainfall in many parts of the industry, the crop's visual appearance is unusually green for this time of year. As soon as temperatures start to rise after winter, this, and the favourable soil moisture reserves, will trigger the onset of vigorous crop growth. These favourable conditions will be maintained in fields with good soils, provided that normal rainfall occurs for the remainder of the season (as currently predicted - see Weather Outlook on page 11 of this issue). The onset of vigorous crop growth will result in a decline in cane quality. The reason for this is because sucrose, which would normally have been stored in the stalk, will now be required as fuel for sustaining these high growth rates.

The scenario above makes use of chemical ripeners as a good option for improving late-season cane quality during the remainder of the current harvest season, especially in areas where the mills will still be crushing during the second half of November into December. For effective use of chemical ripeners during the coming months the following recommendations should be noted:

1) Fusilade Forte (or generic products) is the ripener of choice for late-season use. It is unlikely that whole stalk juice purities will drop to below 75%, which excludes the use of Ethephon or the combination (piggy-back) treatment;

2) The same principles for early-season ripening also holds true, especially those related to good crop vigour. Only crops with abundant green leaves (typically 8 leaves or more), and with upper internodes showing good signs of resumption of rapid growth, should be considered for spraying. Increasing the length of the uppermost internodes is a good visual indicator;

3) If there is any doubt, the best advice would be to test whole stalk juice purities through CTS before making a decision to spray a particular field. A random selection of 12 – 16 uniform stalks from a field should be bundled together as a single sample and sent for analysis. Juice purities below 85% in a healthy crop indicates favourable conditions for the use of Fusilade Forte;

4) When using Fusilade Forte during the late-season, allow for a 6 – 7 week spray-to-harvest interval;

5) Fields with more than 30% flowering stalks should not be ripened;

6) **Very important** - Treat every field on its own merits and do not ripen excessively large areas or problem fields. Rainfall could disrupt harvesting, resulting in very undesirable carry-over of chemically ripened cane; and

7) For more information on the effective use of chemical ripeners, consult the SASRI Information Sheets 12.1 – 12.3.

By Riekert van Heerden (Senior Scientist: Sugarcane Physiologist)

SUGARCANE BIOTECHNOLOGY

In the previous edition of the Link (May 2011), the sugarcane biotechnology article focused on genetically modified (GM) sugarcane. Understandably, it is easy to overlook other biotechnology applications, as they tend to occur in the background and lack the glamour of genetic engineering. However, cutting edge techniques in biotechnology ensure that SASRI and our industry remain globally competitive and innovative.

Tissue culture and micropropagation

Many plant cells have the capacity to regenerate a whole plant from a section of the plant. Tissue culture refers to this practice carried out in sterile conditions on an artificial medium that contains nutrients and plant growth hormones. This technology is applied to sugarcane:

- to bulk up varieties rapidly and on a large scale e.g. the NovaCane® micropropagation system developed by SASRI;
- to produce disease-free plant material;
- to screen cells for resistance to certain chemicals (e.g. herbicide tolerance);
- for long-term storage of valuable plant material; and
- to produce GM plants.

Marker assisted breeding

Traditionally, crop breeders select superior plants based on their visible traits or measurable performance in the field. This process is difficult and slow, especially in sugarcane which has a complex genetic make-up which means that it is difficult to predict the outcomes of crossing. Breeders have to make their selection of superior lines by screening hundreds of thousands of seedlings to select one or two varieties for release.

Marker assisted breeding is a 'shortcut' used by breeders to select good parents and superior offspring. Some simple traits, like flower colour, may be controlled by a single gene. Other more complex characteristics, like crop yield or disease resistance, may be influenced by many genes. To help identify specific genes of interest (e.g. disease resistance or high yield), breeders use molecular markers (like flags) that are located near the DNA sequence of the desired gene. If breeders can find the marker linked to the gene, it means the desired gene is present. SASRI breeders are using molecular markers for identifying eldana- and smut-resistance and projects are under way to search for markers for rust and thrips resistance. This novel approach to breeding not only gives our experts a chance to choose superior parents for crossing but they will also have a better idea of what to expect in the off-spring.

Fingerprinting

Genetic DNA fingerprinting is a process whereby a standard set of molecular markers is used to create an individual profile (like a barcode) for each variety for identification purposes.

DNA fingerprinting holds many benefits including genetic characterisation, variety protection and traceability.

Pathogen diagnostics and quarantine

The detection and identification of pathogens play a vital role in limiting the spread of diseases in seedcane in commercial sugarcane fields and in international germplasm exchange. Although visual symptoms are commonly used for disease diagnosis in the field, molecular techniques are more accurate and can pick up low populations of a pathogen. SASRI uses specialised molecular techniques for the detection and identification of bacterial, fungal and viral pathogens as well as sugarcane pests. SASRI researchers are continuously updating the suite of techniques for pathogen detection. When unusual disease symptoms are observed, as was the case with *Maize streak virus*, we were able to rapidly identify which disease and strain we were dealing with based on pathogen DNA.

The quarantine facility at SASRI has been operational since 1924 and it ensures that breeding material that is imported to South Africa from exotic locations harbours no known pathogens. Similarly, we certify that varieties shipped from SASRI to elsewhere in the world are disease-free.

By Sandy Snyman (Senior Biotechnologist)

GRASSHOPPER OUTBREAKS

Over the past five years, increasingly severe outbreaks of grasshoppers have been reported in the Empangeni area. The most recent outbreak was particularly severe and covered hundreds of hectares. It is thought that this could be related to the 2010 drought; such conditions are ideal for outbreaks of grasshoppers particularly when followed by good rains, which occurred this season.

To date, seven species of grasshoppers and locusts have been found feeding on sugarcane. The number of species involved, complicates control options because they vary in their biology and susceptibility to control practices. Infestations typically begin in mid summer and develop in the following months. Numbers generally decline as summer ends.

Being leaf feeders, grasshoppers eat the green leaf blades, leaving behind the hard midrib. Such leaf damage can significantly reduce the growth of the plant with a consequent effect on crop yield.

So severe were the infestations that growers resorted to applying insecticides and biocides to try to reduce the impact of this pest, but the effect was not considered optimal.

Some grasshopper species found on sugarcane in the Empangeni area.

Besides using pesticides there exists the possibility of destroying grasshopper eggs, which if successful can have a major impact on outbreaks. Grasshoppers lay eggs in the soil in packets. The depth depends on the species involved as well as soil type and moisture content but, by rotavating the top 5 cm of soil, many eggs can be destroyed, thereby reducing subsequent populations. Just where eggs are laid in sugarcane fields has yet to be determined, but they do prefer to lay in bare soil. So, by rotavating the interrows of crops affected by grasshoppers it may be possible to reduce grasshopper numbers.

SASRI is instituting research projects that aim to develop immediate and long-term strategies for grasshopper control. As a first step, practices used for grasshopper control on other crops will be reviewed and where possible, adapted for use in sugarcane fields. In addition, aspects of grasshopper biology and ecology are to be investigated to provide a better understanding of the pest, which will ultimately lead to optimal control strategies for future outbreaks.

By Graeme Leslie (Principal Entomologist), Malcolm Keeping (Senior Entomologist) and Tom Fortmann (Regional Extension Manager: Zululand)

Weather Outlook

Review

Monthly rainfall from April to July 2011 was predominantly above normal for most regions (Figure 1). The unusually high winter rainfall filled soil profiles to support cane growth. Harvesting operations and cane quality could be expected to be negatively affected by this unseasonal winter rainfall.

Maximum and minimum temperatures were generally below normal over the same period. This would result in slow ratooning and possibly increased cases of frost damage in the Midlands region.

Outlook

The ENSO (El Niño - Southern Oscillation) phenomenon in the tropical Pacific Ocean has returned to a neutral phase and its future direction is uncertain. Reliable predictions of ENSO conditions during the summer months will only become available in October.

The International Research Institute for Climate Society and the European Centre for Medium Range Weather Forecasts predict normal rainfall for September 2011 to January 2012. The South African Weather Service forecasts rainfall in early summer (September to October 2011) to be above-normal for the southern parts of the industry and below-normal for Mpumalanga. Rainfall in midsummer (November 2011 to January 2012) is expected to be below-normal for most areas except for Mpumalanga, where above-normal rainfall is expected.

Temperatures in spring are expected to be above-normal across the industry. Please visit the SASRI weather web http://portal.sasa.org.za/weatherweb/ for links to the updated seasonal climate forecasts.

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

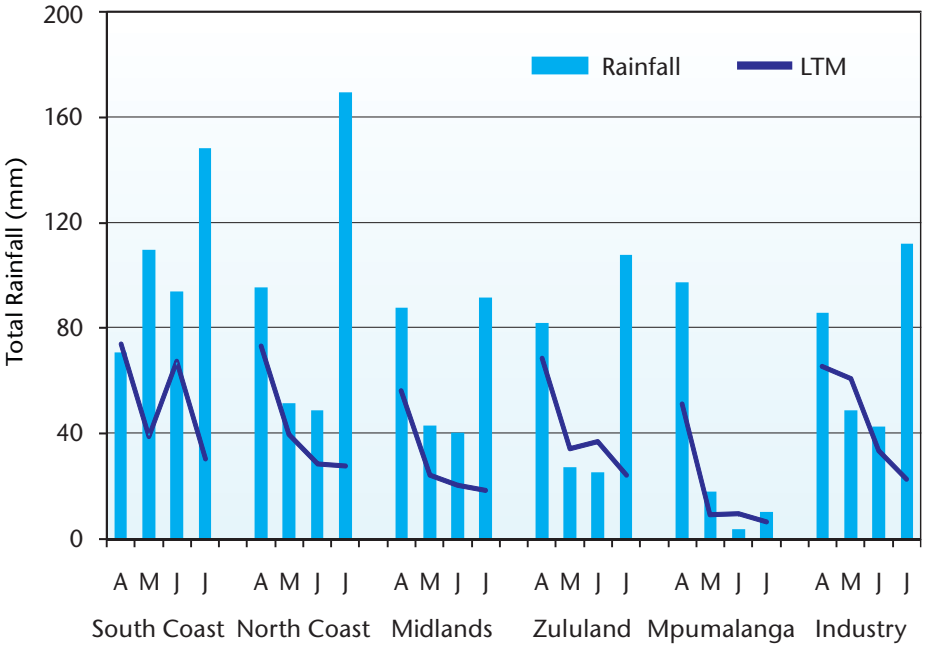


Figure 1. Regional and industry monthly total rainfall and the respective long term means (LTM) for April to July 2011.

Specialist Advisory Requests (SARs)

SASRI offers expert specialist advice to agrochemical companies and supports the entry of new and improved products into the market that will be of direct benefit to the South African sugar industry. This involves testing the efficacy of these new products and facilitating registration, where required. The products include herbicides, fungicides, ripeners, nematicides and fertilisers, as well as a range of other growth promoting and pest and disease controlling products. Products are selected for testing based on the likely benefit they will have for the sugar industry.

An SAR Panel consisting of four SASRI scientists assesses the feasibility of each SAR received. They will also consider whether SASRI has the scientific capacity to undertake the research. If the SAR is feasible, and SASRI has the capacity to take it on, the SAR Panel will communicate this to the client together with a contract quote.

After completion of the investigation, a detailed research report will be prepared. This report will be peer-reviewed by the SAR Panel before submission to the client.

SASRI receives a host of advisory requests each year, and experience shows that each request tends to be unique in terms of design and methodologies required; therefore it is not possible to assign generic costs. Costs will be determined for each specialist advisory request that comes through to SASRI.

If you wish to make use of this service, please contact the SASRI Operations Manager (e-mail: (e-mail: kerry.redshaw@sugar.org.za or sars@sugar.org.za)

By Kerry Redshaw (Operations Manager)

Topical Tips

Following the recent good winter rains, the control of early weed growth could be a challenge in some areas. Make sure to regularly inspect fields for signs of weed growth. Long-term pre-emergent herbicide applications will most probably require the addition of registered 'knock-down' herbicides. These herbicides need to be applied carefully and at the correct rates to prevent damaging the crop. The SASRI herbicide guide is an excellent aid to help you make the correct choice.

Whilst late autumn and winter rain has improved the prospects for a good crop this year, it has caused cane quality problems in some areas. Make sure to always harvest those fields that are the most MATURE. Visual observations of the length of green top, applying the 'taste test' to the upper internodes, and considering the varieties to be harvested are some ways in which an assessment of the relative maturity of fields can be made. A more accurate, although more complex quality test can be done using a refractometer. If conditions for good growth continue, there could be situations in the rainfed regions where late season ripening could be effective. Ask your local SASRI Extension Specialist for assistance.

Last season, there were indications of an increase in the levels of mosaic disease in some susceptible varieties such as N12, N19 and NCo376. Inspect young ratoon cane for symptoms and discuss control measures with your Pest and Disease Officer or Extension Specialist. Make sure to inspect all seedcane nurseries carefully to ensure levels of mosaic and smut are below thresholds. In areas where mosaic is historically a problem, such as the Midlands, planting susceptible varieties either before the end of November or after January can reduce the risk of infection. Smut disease is still very prevalent in the northern parts of our industry. Roguing of diseased stools remains the first line of defence in the fight to control smut. Begin inspecting now, early in the season, and catch the disease before whips develop.

Levels of eldana in the southern coastal and high altitude areas of the industry increased significantly last year due to the drought. Currently, indications are that the pest is not yet under control and it is therefore important to harvest all fields with high levels of eldana this season. Cane to be carried over to next season also needs to be within acceptable local limits. P&D teams might not be able to inspect all carry-over cane and growers are strongly urged to inspect their fields to supplement P&D inspections.

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 heigh, using clean water. 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.

Take soil samples to give you the EXACT fertiliser requirement for each field. The new FAS requires growers to provide certain additional information such as attainable yields and details of green manure crops that have been grown. Make sure to carefully complete submission forms so that the best possible recommendations can be provided.

By Rowan Stranack (Biorisk Manager)