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LONGHORN beetle

This new pest to sugarcane was recently discovered in the Entumeni area. While there is still extensive research being done, SASRI has approved a few measures to assist with controlling the pest. Farms with this infestation have been placed under a conditional quarantine and movement of cane has been restricted in this area (page 3).

Also in this issue...

Farming through science

A recent nematode grower day in Eston highlighted the importance of the grower-extension-researcher partnership. This interaction results in valuable knowledge exchange and is key to succeeding in sugarcane agriculture (page 8).

Herfskommandowurm

Die herfskommandowurm het onlangs groot skade in verskeie mielielande in Suid Afrika aangerig. Sover is nog geen herfskommandowurms in suikerriet aangetref nie maar SASRI moedig die pro-aktiewe registrasie van drie chemikalieë aan vir ingeval die wurm in suikerriet gevind word (bladsy 11).

Sulphur

Sulphur is a nutrient that is often forgotten when preparing recommendations for fertiliser application. The article on page 6 further discusses its role in soil nutrition.

SASRI

Unlocking the potential of sugarcane

Message from the Director

Dr Carolyn Baker

Given that SASRI represents a significant industry investment, extensive planning over the years has been devoted to the configuration and refinement of its research programme. Throughout, the process is designed to encourage participation and commentary particularly by growers.

Local Research, Development and Extension (RD&E) committees play an important role in this regard. The annual RD&E Committees' workshop that is held every other year in the rainfed and irrigated regions respectively, serves as a superb platform for SASRI stakeholders to address a range of pertinent sugarcane production issues. These issues are elicited annually from all regions of the industry in advance of the workshop, collated and then presented for discussion at the workshop.

The ensuing discussion provides the first step towards building the research programme for the forthcoming year. This procedure of engaging directly with grower requirements has been refined over the years and is successfully managed in a joint effort between the research and extension environments.

At this year's RD&E workshop, the focus was on R&D delivery with a specific emphasis on the value of grower-extension-research partnerships. One example of where this partnership was eloquently achieved was through the joint efforts of ripener expert Riekert van Heerden, grower Brad O'Neill and extension specialist Paul Botha. Their collective wisdom in conducting a series of commercial ripener trials has delivered very useful outcomes that are shared with local growers to encourage good practice. Developing such relationships is not always easy. Yet, when they are effectively and meaningfully nurtured in association with knowledge generation and exchange, they lead to enhanced understanding of specific issues and improved delivery of worthwhile outcomes.

Successful partnerships are characterised by the desire to achieve a common goal, and in the case of sugarcane agriculture, grower profitability is the target. Assembling the right mix of expertise is the key to success, and this together with a good dose of mutual trust, culminates in lasting relationships. While these ingredients are the key to success, the importance of reflection and regular feedback should not be underestimated.

The overall transparency with which SASRI constructs its research programme is designed to engender trust and support from the industry. It is for this reason that contributions from all stakeholders are encouraged and valued during the development of SASRI's research programme, since they have a significant influence over SASRI's value proposition.

Latest update on the longhorn beetle

Rowan Stranack
(Extension and Biosecurity Manager)

The longhorn beetle that was found in Entumeni late 2015, has been positively identified as ***Cacosceles (Zelogenes) newmani.*** The larvae of the adult beetle were found to cause extensive damage to the lower section of the sugarcane stalk.

Inspections of 313 fields covering 1 752 ha in the Entumeni area have shown that the beetle is currently restricted to 40 fields totalling 391 ha on four farms. Larvae of the beetle were found in late 2015 but pupae and adult beetles were found only in January 2017. Beetles have become very active in February this year and were seen flying to new fields, making the spread of the pest a possibility. With a single female laying up to 750 eggs, this threat is very real.

In an attempt to contain the pest, amendments have been made to the Sugar Industry Agreement proclaiming the longhorn beetle a hazardous pest. In addition, various remedial measures have also been gazetted e.g. crop eradication, the registration of an insecticide treatment (WARLOCK 19.2 EC) and restrictions on cane movement - in particular the movement and sale of seedcane.

SASRI is currently carrying out research in order to fully understand the biology of the pest. Various control methods and means of trapping the insect are also being tested. In the meantime, Biosecurity personnel throughout the industry are on high alert for the pest.

The latest development to control the pest has been the imposition of a conditional quarantine on affected farms. This means that there are now restrictions on the transportation of infested cane as well as a ban on the movement of seedcane off these farms.

Nuutste opdatering oor die suikerriet langhoringkewer

Die langhoringkewer wat in laat 2015 in die Entumeni area gevind is, is geïdentifiseer as ***Cacosceles (Zelogenes) newmani.*** Bewyse is gevind dat die larwe van die volwasse kewer grootskaalse skade aan die laer dele van die suikerriet stronk veroorsaak.

Inspeksies uitgevoer in 313 suikerrietlande wat ongeveer 1 752 hektaar beslaan in die Entumeni omgewing wys dat die kewer tans tot slegs 40 suikerrietlande wat 391 hektaar beslaan, tot vier plase beperk word.

Larwes van die kewer is in laat 2015 gevind maar papies en volwasse kewers is eers in Januarie 2017 gevind. Kewers het baie aktief geraak in Februarie hierdie jaar en daar is waargeneem hoe hulle na naby geleë lande vlieg, wat die verspreiding van die pes 'n moontlikheid maak. Met 'n enkele vroulike kewer wat tot 750 eiers kan lê is die bedreiging beduidend.

In 'n poging om die pes te beheer is daar veranderings aangebring aan die Suikerbedryf Ooreenkoms deur aan te kondig dat die langhoringkewer as 'n bedreigende pes in suikerriet beskou moet word. Bykomende remediërende maatreëls soos die uitploeg van suikerriet lande, die nood registrasie van die insekdoder WARLOCK 19.2 EC vir die behandeling van die langhoringkewer op suikerriet, asook die beperking op die vervoer van riet van een area na 'n ander (veral die verkoop en vervoer van saadriet), is ook tot die ooreenkoms bygevoeg.

SASRI is tans besig om navorsing te doen om die biologie van die pes ten volle te verstaan. Verskeie beheermaatreëls en maniere om die insek te vang word ondersoek. In die kort termyn is Biosekuriteit personeel oor die hele suikerindustrie op hoë gereedheidsgrondslag geplaas ten opsigte van die pes.

Die jongste verwikelling rondom die beheer van die pes is die instel van 'n voorwaardelike kwarentyn oor die geaffekteerde plase. Dit beteken dus daar is nou beperkings op die vervoer van besmette suikerriet sowel as 'n verbod op die verskuiwing van saadriet vanaf hierdie plase.

Topical Tips

Cane quality

With the season under way it is important to pay close attention to cane quality. Growers must ensure that fields to be harvested are MATURE; that when harvesting is carried out the cane is CLEAN - being free of extraneous material such as excessive crop residue, tops and soil, and that, once harvested, cane reaches the mill FRESH with the minimum delay between harvesting and milling.

Rowan Stranack
(Extension and Biosecurity Manager)

Sucrose %
(13% or greater)

Factors increasing sucrose

- ✓ Correct variety for area.
- ✓ Correct planting date.
- ✓ Ripening immature cane early or late season.
- ✓ Harvest-crush delay < 2 days.
- ✓ Harvest mature cane with juice purity >85%.

Factors decreasing sucrose

- × Harvesting immature cane with juice purity <85%.
- × Topping too low and causing sucrose losses.
- × Harvest-crush delays.

Weed control

Service and calibrate equipment in time for fertiliser and herbicide application in spring. Plan your winter weed control programme early so that early flushes of weeds can be effectively controlled. With fields being harvested, this is the best time to identify potential problem areas where creeping grasses are establishing. Mark these areas clearly so that repeated follow up sprays can be carried out during the coming spring and summer.

Soil and nutrition

Take soil samples soon after harvest to plan your liming and fertiliser programme. In plant fields, take samples of both the topsoil and subsoil layers 0-200 mm; 200-400 mm and 400-600 mm to determine if subsoil acidity problems exist. Correcting acidity will ensure both better yields and longer ratoon life.

Sandy soils will benefit and respond to additional care and management. Green cane harvesting, minimum tillage, careful irrigation scheduling, the application of organic manures, split dressings of nitrogen fertilisers and the application of nematicides are just some of the practices which sandy soils will respond to. Consult your SASRI Extension Specialist for advice on a suitable management strategy for the sandy soils.

Non-Sucrose % (less than 2%)

Factors decreasing non-sucrose

- ✓ Harvest-crush delay < 2 days.
- ✓ Mature cane with high juice purity.
- ✓ Topping at correct height (also depends on season).

Factors increasing non-sucrose

- × Height of topping: topping high increases non-sucrose.
- × Excess N: can extend growing period and prevent natural ripening. Sample soils and leaves.
- × If harvest-crush > 2 days, sucrose converts into non-sucrose.

Fibre % (less than 15%)

Factors decreasing fibre

- ✓ Little/no leaf material.
- ✓ Harvest during dry conditions.
- ✓ Make bundles instead of windrows.

Factors increasing fibre

- × Excess Potassium: can increase ash & fibre%.
- × Excess trash: increases fibre%.
- × Excess soil and roots: wet weather and incorrect cutting.

Purity % (greater than 85%)

Factors increasing purity

- ✓ Mature cane.
- ✓ Clean cane.

Factors decreasing purity

- × Extraneous matter.
- × Immature cane.
- × Eldana damage.
- × Drought.
- × Variety choice.

Although this year promises a much better crop, rainfall and cane growth has been variable in some areas. Where the relative maturity of fields is in question, the Pur*Est*™ app (normally used for ripening decisions) can be used to determine which fields are the most mature. The total income from a field is the product of both yield and quality and this also needs to be considered when deciding upon the order of harvest. All SASRI Extension Specialists have access to refractometers and the Pur*Est*™ app, so call your local specialist for advice.

Pests and diseases

LPD&VCC areas are making very good progress reducing the incidence of RSD. To continue this excellent trend, sample all plough out fields for RSD and ensure long fallows are implemented, especially in RSD-positive fields.

Some areas are still experiencing critical shortages of Certified and Approved seedcane. Consider establishing your own nurseries in order not to rely on outside co-operators for seedcane each year. In this regard, seedcane will need to be planted this year to meet commercial requirements in two season's time. Careful planning is therefore required.

Scout fields for harvest next season and implement an eldana spray programme to contain this pest during the remainder of the season and the off-crop. Moth peaks are in autumn and late spring and this is the time to apply diamide products to effectively control eldana populations.

Soil Conservation

Winter is the ideal time to establish new waterways and other water-carrying conservation structures. Use a tanker to water newly planted grass runners. Take care to plant only non-invasive indigenous grasses such as Coastal buffalo grass in waterways.

Unfortunately the stabilisation of major watercourses has become a somewhat neglected practice. Heavy rains at times during the past few years have exposed stream banks in some places and these need to be stabilised before further damage occurs. Consult your SASRI Extension Specialist for literature and guidelines on the subject of waterway and watercourse stabilisation.

SOIL HEALTH

SUL

Neil Miles *(Senior Soil Scientist)*

Optimum yields can be achieved only where all nutrients are in adequate supply. An often overlooked nutrient in the development of fertiliser recommendations is sulphur (S). This nutrient is an essential building block of proteins and many enzymes. Where S is not available in adequate amounts, reductions in yield and crop quality can occur. An important consideration is that there is a very strong interaction between S and nitrogen (N) in the growth of the crop. Adequate supplies of S are therefore of great importance in ensuring efficient response to applied N fertiliser.

Reasons for the limited attention afforded S in crop nutrition programmes include the following:

1. *Soils with higher organic matter levels generally have adequate reserves of S to ensure high yields.*
2. *Sulphur requirements have in the past been supplied incidentally through the use of S-containing fertilisers such as ammonium sulphate or superphosphate. However, these fertilisers are no longer widely used.*
3. *Analysis of both soils and plants for S is more complex than for other major nutrients such as P, K, Ca and Mg, and consequently many laboratories do not offer S tests on a routine basis.*

Deficiency symptoms and crop uptake

Sulphur deficiency symptoms are similar to N deficiency symptoms in that for both nutrients, plants develop a pale-green to yellow colour. However, unlike N deficiency where symptoms first appear on the oldest leaves, S deficiency symptoms are often uniformly distributed between old and young leaves.

A widely-held view is that crop S and phosphorus (P) requirements are approximately the same. However, this may not always be true: sugarcane crop nutrient removal data often reflect up to 50% more S being removed than P. For high-yielding crops, S removals in the harvest are usually in the range 30 to 50 kg/ha.

Sulphur deficiency in young cane growing on a sandy soil.

Sulphur in soils

The bulk of the S in the soil is present in the organic matter; this is reflected in the positive relationship between total carbon and sulphur in sugarcane topsoils. Therefore, the S-cycle in soils is in many respects similar to the N-cycle, with mineralisation (release of S from the organic matter) and immobilisation ("tie-up" of S in the organic matter) governing the supply of this nutrient to plant roots. Since these reactions are carried out by soil microbes, factors such as soil temperature and moisture, as well as tillage and liming have an important impact on S availability in the soil. These considerations limit the value of soil tests as a basis for predicting S availability to the crop, with leaf testing being a more reliable option.

As organic matter is a major reservoir for S in soils, sandy soils with their low organic matter contents tend to be particularly poor suppliers of S for plant growth. In addition, the fact that sulphate readily leaches in sandy soils underlines the need for regular applications of S-containing products to these soils.

PHUR | THE (ALMOST) FORGOTTEN NUTRIENT

Sulphur fertilisers

Conventional S-containing fertilisers and their S-concentrations are listed in Table 1. In addition to these products, a number of 'speciality' products containing S are on the market.

Sulphur fertilisers in general fall into three groups:

1. *Those that contain sulphate that the plants can immediately absorb (examples are ammonium sulphate and potassium sulphate).*
2. *Elemental sulphur which yields sulphate after a conversion process in the soil.*
3. *Various combinations of the above two types.*

Fertiliser	S content (%)	Notes
ammonium sulphate	24	Ammonium sulphate, while being an excellent source of S, has the disadvantage of generating considerable acidity in the soil.
potassium sulphate	18	Due to high cost, potassium and magnesium sulphates tend to be used only on high value 'speciality' crops, and not on row crops such as sugarcane.
magnesium sulphate	13	
'single' superphosphate	10 - 14	Superphosphate is also used on 'speciality' crops due to the cost per unit of nutrients contained in it.
gypsum	13 - 23	Gypsum is a highly cost-effective S-fertiliser, which also supplies large amounts of calcium.
elemental sulphur	99	Elemental S is a concentrated form of S which must be converted by soil micro-organisms into sulphate in order to be available for plant uptake. The oxidation process generates soil acidity, and typically takes six to eight weeks to complete in summer, and about double this time in winter. Elemental S particles should be extremely fine (<0.1 mm in diameter) in order to facilitate their oxidation by soil micro-organisms.

Recommendations for sugarcane

As noted earlier, S deficiencies are most likely to occur on light sandy soils with low organic matter contents. On these soils, S supply should be regularly assessed through soil and leaf testing.

In plant crops, potential deficiencies can be easily rectified by the application of gypsum. In general, rates of gypsum required to address subsoil acidity problems supply sufficient S for the plant crop and several ratoons. If subsoil acidity is not a limitation, a relatively low rate of gypsum (500 – 750 kg/ha) can be applied in the plant furrow. In irrigated areas with high soil pH levels, application of N as ammonium sulphate is a convenient means of meeting crop S requirements.

For ratoon crops on sandy soils, regular topdressings of S-containing fertilisers are generally necessary, with S rates of between 40 and 60 kg/ha being recommended.

FARMING THROUGH SCIENCE

The age of the experimental grower

Kerisha Raghunandan
(Publications Officer)

With the development of new technologies, sophisticated agrochemicals and an ever-changing climate, farming is no longer just about planting a seed in the ground and waiting patiently for it to grow. Agriculture today, has evolved into a complex system, requiring the grower to understand his crop, the surrounding environment, and the available tools to boost the potential of his farm. Keeping abreast of these technologies as well as trying to run a farming business, means the grower must be as strategic as a businessman and as curious as a scientist.

Brad Thompson ***(above, right)*** is a grower in the Eston area who is currently managing an area of over 650 hectares of sugarcane. Brad has had exposure to both the timber and sugar industries, allowing him to realise the importance of understanding the individual needs of the crop being planted. He is also fully aware of the need to balance his roles of both businessman and researcher. In order to keep up with the latest trends and recommendations in sugarcane agriculture, Brad relies on his knowledgeable SASRI Extension Specialist, Paul Botha (above, left). Brad and Paul work together to maximise the potential of his farm as well as implement the latest innovations from SASRI, such as new varieties. Paul's vast knowledge on Land Use Planning is also assisting Brad to correctly build new roads on his farm. Managing a large area of land is very demanding and Brad's time is constrained maintaining this balance. Therefore, having Paul just one call away is "hugely helpful" as described by Brad. This Grower-Extension relationship has allowed Brad to improve his already vast knowledge of sugarcane and has assisted him in remedying several problems in the field.

Recently Brad extended this association by adding a new participant to the mix, Prabashnie Ramouthar, a SASRI Nematologist. She and Uvendri Pillay (SASRI Research Officer), conduct area-specific trials with many farmers in order to raise the awareness of nematodes and test new nematode management options. Nematodes are known to cause economic damage in sandy soils but can also be a problem in slightly higher clay soils. Therefore, Prabashnie encourages all growers with sandy soils or fields where growth problems are being experienced, to submit soil and root samples to test for these microscopic menaces. Having areas of sandy soils, Brad requires nematode management on his farm. This made him an ideal candidate for Prabashnie and Uvendri's nematode research trials to develop suitable management options for his area.

For the trial, Brad allowed the scientists an area of approximately 1.5 ha and has been an active participant in the actual design of the research. The first trial tested different varieties and their response to a nematicide. This enabled a simultaneous variety evaluation for the area and has procured the skills of SASRI Variety Scientist, Sanesh Ramburan, to the study. In this trial, newer varieties such as N61 and N62 have been included. The second trial involves testing different nematicides, most of them not yet registered on sugarcane.

This Grower-Extension-Scientist synergistic partnership has blossomed. Grower communities work cohesively by sharing knowledge of their practices to assist each other with variety choice and other best management practices. The knowledge gained from the work conducted by Brad, Paul and the SASRI Scientists has not just helped him, but the whole community. Data and experiences from the trial have already been shared at a recent grower day. This nematode research has helped several growers in the area as they are now able to view the on-farm trial results and adjust their practices accordingly. In addition, growers can now view the responses of the newer varieties recommended for their area.

Growers are encouraged to feed their curiosity by conducting on-farm trials of their own to test new technologies and innovative recommendations from SASRI. This will assist with understanding the potential of the farm. Involving the local Extension Specialist is crucial as his knowledge and expertise will assist these investigations. Growers are also encouraged to participate in SASRI research trials. As in the case of Brad Thompson, by providing just a hectare of land, he has invested in a long-term profitable learning cycle for himself, his neighbours and SASRI.

Prabashnie Ramouthar presenting trial results at a recent grower day on Brad Thompson's farm in Eston.

Fall armyworm update

Rowan Stranack
(Extension and Biosecurity Manager)

Fall army worm, *Spodoptera frugiperda*, is a migratory lepidopteran (moth) species. It originates from the tropical regions of South America but is also present in some of the southern states of North America. The main crop hosts of the pest are maize, sorghum, groundnuts, cotton and soya beans. The moth is a strong flyer but it is the larval (caterpillar) stage that causes the damage. In maize, the caterpillar stage is known to cause extensive damage to the leaf whorl, tassels, green leaves, sheaths and even emerging maize ears themselves. There are more than 80 different plant species also known to be attacked and sugarcane is amongst these.

Fall army worm arrived on the African continent in 2016 and was reported from West and Central Africa where it caused serious crop losses, particularly in maize. Since then the pest has spread southwards where this year it has been recorded in the Limpopo, Gauteng, North West, Mpumalanga, Free State and Northern Cape provinces of South Africa. Maize, sweet corn and sorghum appear to be the main target crops. In recent weeks, the pest has been recorded on maize in the cane belt of Mpumalanga, Pongola and as far south as Harding on the south coast of KwaZulu-Natal.

The pest has not yet been found on sugarcane despite being found on maize in close proximity to cane. Specialists and Biosecurity teams from SASRI are on high alert and are monitoring sugarcane and adjacent crops. Should the pest attack sugarcane at some stage, control measures will be implemented. Without clear evidence that sugarcane is currently under threat, it is best that the pest be controlled in those crops where it is currently a problem. The Department of Agriculture, Forestry and Fisheries (DAFF) has issued numerous updates on the distribution and control of the fall army worm and, should the problem escalate, the sugar industry will take guidance from DAFF in accordance with their Emergency Pest Response Plan. There is also a national fall army worm action group under the auspices of DAFF who hold weekly meetings and provide updates on the spread as well as recommended monitoring and control measures. The sugar industry is part of that group.

As a proactive step, three chemical options have recently been registered against the pest for use in sugarcane should it become a problem in this crop. These include CORAGEN (active ingredient: chlorantraniliprole), STEWARD (active ingredient: indoxacarb) and AVI-MERKAPTOTHION DP (active ingredient: mercaptothion). Growers are encouraged to use only these options should there be an outbreak in cane.

Reference: Department of Agriculture Forestry and Fisheries

Herfskommandowurm

Rowan Stranack *(Voorligting en Biosekuriteit Bestuurder)*

Die herfskommandowurm, *Spodoptera frugiperda*, is 'n migrerende lepidoptera (mot) spesies. Hul oorsprong stem van die tropiese streke in Suid Amerika maar is ook teenwoordig in sommige suidelike state van Noord Amerika. Die hoof gasheer plant vir die pes is mielies, sorghum, grondboontjies, katoen en sojaboon. Die mot is 'n sterk vlieër maar dit is die larwe (wurm) stadium wat skade veroorsaak. In mielies veroorsaak die wurm wyd verspreide skade aan die blaarkroon, blomme, groen blare, skede en die ontwikkelende stronke. Dit is bekend dat meer as 80 verskillende plant spesies aangeval word waarvan suikerriet een is.

Die herfskommandowurm is vir die eerste keer in 2016 op die Afrika kontinent opgemerk. Dit het ernstige oesverliese in wes en sentraal Afrika veroorsaak, veral in mielies. Sederdien het die pes suidwaards versprei waar dit hierdie jaar in Limpopo, Gauteng, Noord Wes, Mpumalanga, Vrystaat en Noord Kaap provinsies aangemeld is. Mielies, suikermielies en sorghum blyk die teiken gewasse te wees. In afgelope weke is die pes in die suikerrietgordel van Mpumalanga, Pongola en so ver suid as Harding op die suid kus van Kwazulu Natal waargeneem.

Die pes is nog nie in suikerriet waargeneem nie ten spyte van die feit dat dit in mielies aangrensend tot suikerriet gevind is. Spesialiste en Biosekuriteitspersoneel van SASRI is hoog ingesteld en monitor suikerriet en aangrensende gewasse vir die voorkoms van die pes. Indien die pes suikerriet sou aanval sal beheer maatreels onmiddellik ingestel word. Sonder voldoende bewyse dat suikkerriet onder druk is van die pes is dit beter om die pes te behandel in gewasse wat aangeval word en dit tans 'n problem is. Die Departament van Landbou, Bosbou en Visserye (DAFF) het al verskeie nuwe skrifte oor die verspreiding en beheer van herfskommandowurm uitgereik en sou die problem eskaleer sal die suikerindustrie leiding neem van DAFF in ooreenstemming met hul Nood Pes Reaksie Plan. Daar is ook 'n nasionale herfskommandowurm aksie groep onder leiding van DAFF wat weeklikse vergaderings hou en almal betrokke op hoogte hou van verwikkelinge rondom die verspreiding sowel as monitering en beheer maatreels. Die suikerindustrie is deel van hierdie groep.

In 'n pro-aktiewe stap is drie chemiese behandelingsopsies onlangs geregistreer teen die pes in suikkerriet, sou dit 'n problem raak. Die middels sluit in, CORAGEN (aktiewe bestandeel: chlorantraniliprole), STEWARD (aktiewe bestandell: indoxacarb) en AVI-MERKAPTOTHION DP (aktiewe bestandeel: mercaptothion).

Bron: ***Departament Landbou, Bosbou en Visserye***

Tawny rust update

Lauren Martin (Assistant Research Officer) & Sharon McFarlane (Sugarcane Pathologist)

Following valuable research by SASRI researchers, the classification of tawny rust *(Macruropyxis fulva)* as a new rust pathogen of sugarcane has been internationally recognised. Three rust pathogens, causing brown, orange and tawny rust, are now known to infect sugarcane. This has significant implications for breeding and selection programmes around the world since resistance to one rust pathogen does not guarantee resistance to the others. As a result, the need for fungicides to manage rust is likely to increase. Two fungicides are currently registered for use against tawny rust on sugarcane in South Africa.

New Science

A **diagnostic test** specific for tawny rust was developed to rapidly distinguish this rust from brown and orange rust. This test will be particularly useful with the orange rust threat to our industry as some symptoms of the two diseases are similar. Orange rust spores have been detected on spore traps located at Komati (see The Link - September 2016) but no symptoms have as yet been observed on cane.

Trials investigating the effect of tawny rust on yield are ongoing in high risk areas.

What we know so far

Varieties are now routinely assessed for tawny rust susceptibility in disease screening trials at Eston and Pongola. Ratings for commonly-grown released varieties are shown below.

Resistant	Intermediate	Susceptible
NCo376, N19, N23, N27, N36, N40, N52, N54, N56, N62	N12, N31, N35, N37, N39, N43, N48, N50, N51, N55, N58, N59, N61	N16, N25, N29, N41, N46, N49, N53, N57

Tawny rust was shown to have at least one alternate host after being identified on *Miscanthus sp.*, a grass closely related to sugarcane. The grass was growing in a shaded, damp environment near Underberg.

Conditions favouring tawny rust infection were found to differ from those of brown rust in that tawny rust spores do not require free moisture to germinate. This would explain the fresh tawny rust infections observed in the normally drier months of June and August in the midlands. Most spore germination was shown to occur at temperatures between 18 and 22°C (brown rust 20 to 25°C). A brown rust risk model using temperature and relative humidity to predict high risk periods, is currently being tested in the industry. If successful, the model will be expanded to include tawny rust using the information generated in this study.

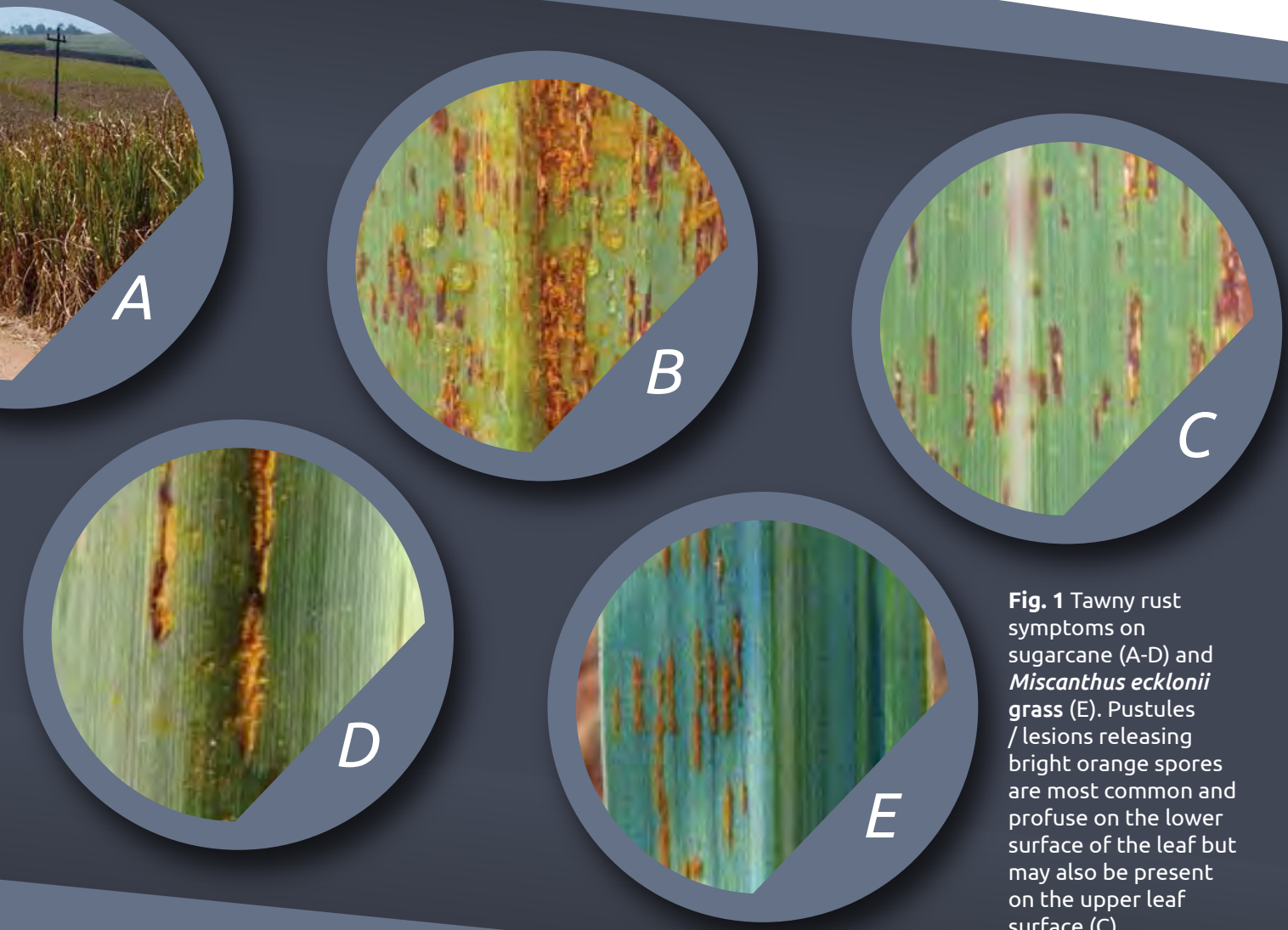
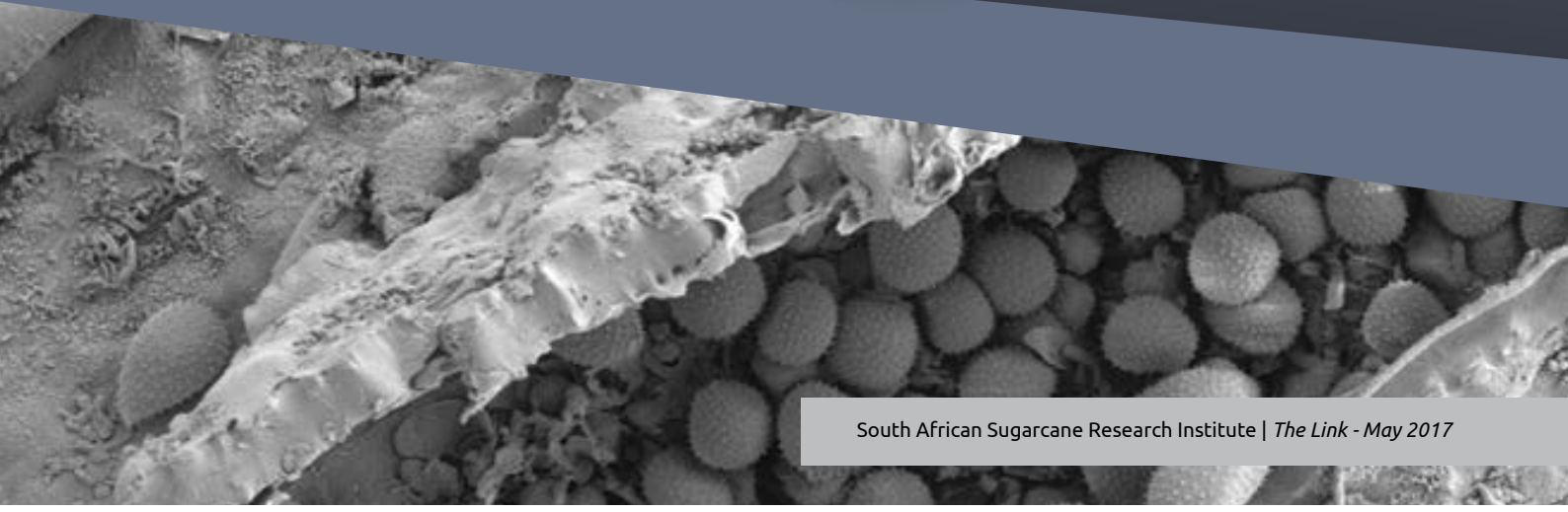


Fig. 1 Tawny rust symptoms on sugarcane (A-D) and ***Miscanthus ecklonii* grass** (E). Pustules / lesions releasing bright orange spores are most common and profuse on the lower surface of the leaf but may also be present on the upper leaf surface (C).



Can we improve management of *Cyperus rotundus*?

Cyperus rotundus is also commonly known as rooi, uintjies, purple watergrass, purple nutsedge and rotundus.

Peta Campbell (Scientist: Weed Control)

Why bother with rotundus?

This species is considered the "world's worst" weed, causing problems in more than 92 countries in at least 52 crops. It grows rapidly and can quickly form dense colonies due to its ability to produce an extensive system of rhizomes and tubers. These are spread by farm tillage implements, erosion, running water, and seedcane transport.

One tuber can produce about 750 tubers in 5.5 m^2 in 24 weeks

Damage

Reduction in crop yields is one of the greatest impacts of this species. Several studies have shown that, if left uncontrolled, it causes approximately 30%-40% yield loss in sugarcane and in extreme cases yields have been reduced by 75%.

Competition is mainly for water, especially during early stages of sugarcane development, with the most impact on yield. Even in humid regions the production of rotundus shoots and tubers could severely restrict water availability to sugarcane. There may also be competition for nutrients. One study suggested rotundus can take up approximately 25 kg N/ha and 48 kg K/ha that would otherwise be available to the cane crop.

Timing of control

Effective sedge control, as early as possible, is crucial to maintain an optimal sugarcane yield. Sedge control should take place in the fallow before planting or soon after cutting or planting cane. This will avoid early competition for moisture and avoid significant yield losses. Control in the fallow is the most convenient and cheapest option.

In addition, control and contain new infestations that have encroached into a rotundus-free field. This will prevent further spread of tubers in the field during normal husbandry operations.

It will also prevent proliferation of tubers that result in "hot spots" of severe competition and uneven yields, requiring more intensive control for many years.

Chemical control

Effective rotundus control is crucial to maintain an optimal sugarcane yield. Best management options are as follows:

- *Chemical treatments with long-term effects.*
- *More than one herbicide treatment.*
- *Translocated herbicide treatments.*
- *Treatment of recent encroachments using knapsack applicators.*

This will impact on the number of tubers produced and their viability, result in stopping the spread, limiting competition and maintaining yield.

Best results have been obtained:

- *pre-emergence - with products containing sulfentrazone and chlorimuron-ethyl,*
- *post-emergence - with knockdown products e.g. paraquat and glufosinate ammonium, and/or*
- *post-emergence - with systemic products e.g. halosulfuron, MSMA and glyphosate.*

When using such products, make sure that your calibration is correct. The risk of under-dosing could have serious yield consequences for the field.

Weather

Phillemon Sithole
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Review

Summer rainfall in the rainfed regions of the industry was much better than previous seasons, and was also well distributed. This allowed most crops to recover from the drought, displaying remarkable growth vigour. Spring rainfall was mostly close to the long term mean. Below-normal rainfall in December was followed by near normal rainfall in January (except South Coast) and above normal rainfall in February (Figure 1). In March, rainfall returned to below normal. The good rains in February also improved irrigation water supplies in many regions. Water restrictions have been lifted in Pongola, and were eased somewhat in Mpumalanga after dam levels rose markedly. However, dam levels in Zululand remain very low and irrigation water supply remains a concern for the affected areas.

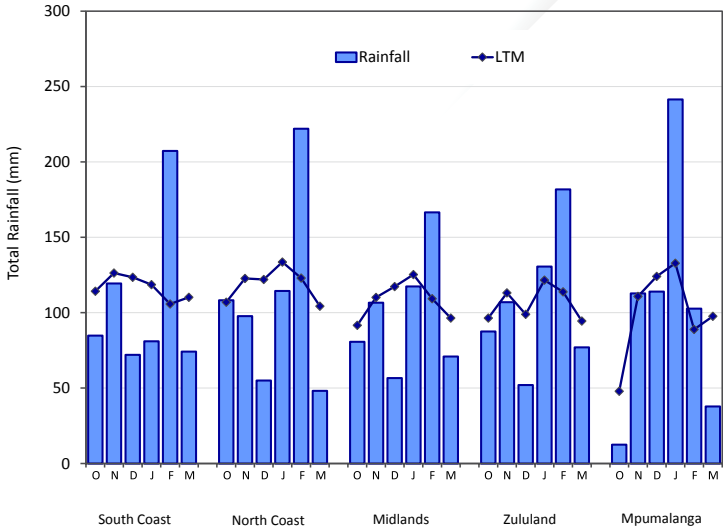

Figure 1. Regional average monthly total rainfall from October 2016 to March 2017 compared to the monthly long-term mean (LTM).

Outlook

This winter:

The South African Weather Service (SAWS), International Research Institute for Climate and Society and European Centre for Medium-Range Weather Forecasts **all predict near normal winter rainfall. Mild winter temperatures are expected.**

Next summer:

The El Niño-Southern Oscillation (ENSO) system is currently in a neutral phase, but there are indications that an El Niño event (warm sea surface temperature in the tropical Pacific Ocean) may develop in the 2017/18 summer (Fig. 2). El Niño events are associated with below normal summer (December to March) rainfall over South African sugarcane producing areas. A positive phase (warm sea surface temperatures in the western tropical Indian Ocean) of the Indian Ocean Dipole is predicted for the second half of 2017, which is associated with above-normal spring (September to October) rainfall over SA sugarcane producing areas.

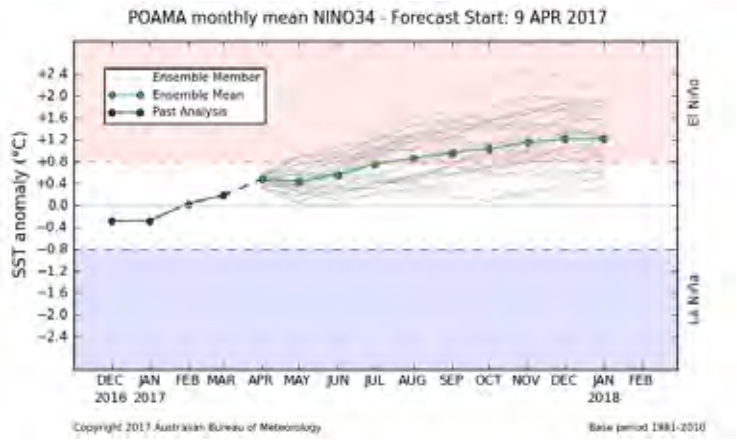

Figure 2. Australian Bureau of Meteorology POAMA forecasts of sea surface temperature anomalies (deviations from the long-term mean) in the tropical Pacific Ocean, indicating the probable development of El Nino conditions in early summer (http://www.bom.gov.au/climate/poama2.4/poama.shtml).

Please visit the Weatherweb available via the SASRI website: www.sugar.org.za/sasri for links to up-to- date seasonal climate forecasts and also for the latest rainfall and other weather data.

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